

Comprehensive Regional Growth Plan for the Fort Bragg Region

Assessment and Recommendations



Chapter 5

Information & Communication Technologies

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DISCLAIMER

This report is intended as an aid to planners, managers, elected officials, and other decision makers in the Fort Bragg region. Our aim is not to dictate what should be done, but to assist in ongoing efforts to achieve goals and objectives identified and valued by the residents of the region. The recommendations presented in this report are suggestions for how the region could work towards those goals and objectives, based on best available information and current understandings.

The information, projections and estimates in this report are based upon publicly available data and have been prepared using generally accepted methodologies and formulas. The projections and needs presented in this report are based upon best estimates using the available data. It is important to note that currently available information and understandings are incomplete and cannot account for the inevitable, but unpredictable, impacts of unexpected global, national, state, and/or local events. Actual results and needs may differ significantly from the projections of this report due to such unforeseen factors and conditions, as well as inaccuracy of available data, and/or factors and conditions not within the scope of this project. Persons using this information to make business and financial decisions are cautioned to examine the available data for themselves and not to rely solely on this report.

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Chapter 5: Information & Communication Technologies

The Tier I counties in the Fort Bragg region have made significant progress toward establishing connectivity in their public safety, education, health, and governmental sectors. High quality broadband education networks are under development throughout the region. VIPER, a statewide public-safety network, has been partially implemented in the region, and a proposal requesting the funds needed to complete this process has been submitted. Connectivity in the region's health sectors—the current quality of which is inconsistent, at best—should be considered one of the region's highest priorities. Most of the area's local government websites do not sufficiently meet the needs of the residents and businesses they serve. In general, the region's information and communication technology (ICT) resources will not meet the expectations of the technologically adept military populations that will be relocating to the region. Filling these information and communications-technology gaps will enhance the growth prospects for the region, and taking a regional approach when doing so will generate appreciable cost, efficiency, and quality benefits.

Information and communication technologies (ICT), especially those supporting high-speed broadband Internet functions,¹ are becoming increasingly critical to local, state, and national economic and community development. In 2006, William Lehr concluded that “Where mass market broadband is available, communities between 1998 and 2002 experienced more rapid growth in (1) employment, (2) the number of businesses overall, and (3) businesses in IT-intensive sections. . . . Results show that the economic impacts of broadband are both real and measurable.”² Between 1997 and 2002, ICT was instrumental in generating two-thirds of the total growth in productivity in the United States and virtually all growth in labor productivity. Lack of broadband access retards economic growth by a full percentage point compared to economic performance in regions having pervasive use of broadband.³ Employment growth in the ICT sector itself is strong

nationwide, with ICT jobs paying 84% more than the average U.S. wage.

The connection between ICT and development will be especially evident in the Fort Bragg region as it experiences expansion-related growth. Many of the military personnel being transferred to Fort Bragg are technologically adept and will expect to have immediate and sophisticated access to such ICT functions as e-government, e-learning, e-health, and e-commerce. If they are to establish the desired professional and personal connection with the community, these newcomers will need both on- and off-base access to high-speed, broadband Internet connections. Even as bandwidth needs increase to accommodate basic operations, new applications will create further connectivity challenges.

From August, 2007, through March, 2008, the e-NC Authority undertook a comprehensive assessment of broadband connectivity uses throughout the seven Tier I counties. The Authority's assessment covered computer and network hardware, software, and the Internet-based platforms on which the software programs run. This section presents the results of that assessment. This report does not cover Fort Bragg or National Guard connectivity requirements. (In both of these cases, connectivity is managed through a proprietary network maintained by the DOD.)

1. On March 18, 2008, the FCC issued an order (FCC 08-89) that called for defining “high-speed” connections as those that are faster than 200 kbps and defining “broadband” connections as those faster than 768 kbps. The e-NC Authority, which tracks high-speed Internet access across North Carolina, promotes the use of broadband connections. For more information about the FCC order, visit www.fcc.gov

2. Lehr, W.H. Osorio, Carlos A. Gillett, Sharon E. and Sirbu, Marvin A., 2005. “Measuring Broadband's Economic Impact” (Presented at the 33rd Research Conference on Communication, Information, and Internet Policy, Arlington Virginia.

3. Robert D. Atkinson, 2007. The Case for National Broadband Policy. The Information Technology and Innovation Foundation (www.itif.org/files/CaseForNationalBroadbandPolicy.pdf)

I. Current Conditions

Among the many competing broadband-access technologies used to connect individual residents and businesses to the network, those that are most relevant to this planning effort are cable modem, digital subscriber line (DSL), and wireless. The relatively high cost of satellite-based connectivity means that this technology is most often used only as a last resort. The cost of the various types of access technologies is generally the same for rural and urban areas, except for the distance-sensitive T-1 technology. Attachment 1 contains a summary of the advantages and disadvantages of the available access technologies.

A. Internet Access Status

Connectivity varies widely across the region and across specific sectors within a given geographical area. The weighted average composite broadband access rate for the seven-county region is 82.11% (**Table 1**). Rates for individual Tier I counties range from a high of 93.9 percent to a low of 82.9 percent (**Figure 1**).

To put this in context, fifty-seven counties in the state have broadband access rates that are below that of the lowest-rated Tier I County in the Fort Bragg region. The percentages presented here reflect the proportion of households in each county that could purchase high-speed Internet if they chose to do so. Because

Table 1. Composite broadband access rates within the Fort Bragg region

County	Percent access to broadband Internet
Cumberland	93.86
Harnett	84.94
Hoke	90.15
Lee	92.27
Moore	82.90
Richmond	85.70
Robeson	83.31
Fort Bragg Region	87.11

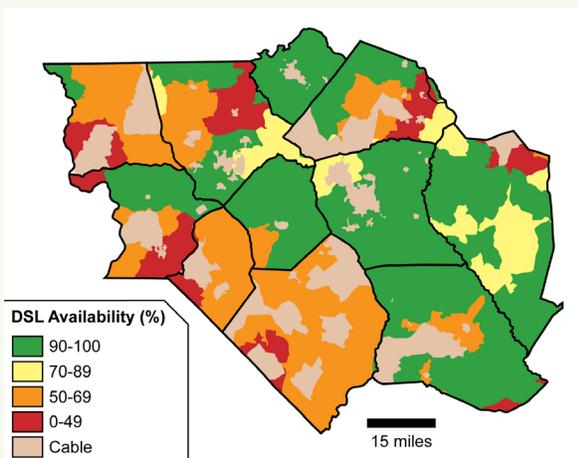
data on wireless and satellite service are not reliable or not available, the percentages cited refer only to cable modem and DSL access. Detailed descriptions of the kinds and uses of Internet access available in each county are presented in the individual county chapters of this report.

Connectivity rates—calculated and reported by the providers themselves—are not as high, however, as the table above would suggest. For one thing, these findings represent *composite* figures. Some areas within a given county approach 100 percent connectivity, while others do not have any access at all. In addition, the region contains a number of areas in which connectivity is theoretically available but where numerous topographical and other features (swamps, bodies of water, public lands, national forests, hog lagoons, reserved military space, and high-density populations, for example) impede broadband transmission. Such barriers are particularly abundant in Bladen and Sampson Counties.

B. Local Government ICT Capabilities

Local governments in the region purchase much of their bandwidth capacity from outside providers. State systems are used for social services as well as the General Courts of Justice System. Local government personnel have varying degrees of knowledge about communications technologies, and they use these technologies to varying extents. Some counties have just now created a Chief Information

Figure 1. Percentage of households that have access to cable modem and DSL



Officer position; persons holding these positions range from novices to highly trained specialists. To date, these CIOs’ primary focus has been the acquisition of the resources required to support this newly important component of local government.

C. Videoconferencing Sites

Videoconferencing facilities support the delivery of distance-education programs to multiple learners simultaneously. Distance-learning centers can support “just-in-time” instruction as well as long-term training and education programs. For the past ten years, the North Carolina National Guard has been very much involved in distance learning and has shared its videoconferencing sites with area community colleges, especially for use as on-the-job training centers.

II. Future Needs

The level of broadband access that will be needed to accommodate the area’s military-related growth is suggested by the results of a survey of US Army Forces Command (FORSCOM) personnel conducted in November, 2007, in the Atlanta region. Ninety-seven percent of the respondents have and use broadband access at home; this percentage is higher than the percentage of home Internet connections available in all of the Tier-1 counties. Sixty-one percent of the FORSCOM personnel use DSL to access the Internet, 36 percent use cable, and only four percent rely on a dial-up modem connection. As shown in **Table 2**, the survey respondents and their families use the Internet at home for a wide range of tasks. It is very likely, therefore, that the influx of FORSCOM personnel will increase the demand for high-quality broadband availability and web-based services in Cumberland County.

In November, 2007, the e-NC Authority convened a meeting on the issue of connectivity and its impact on the region. The meeting was attended by stakeholders from across the Fort Bragg region, including representatives of the public safety, education, health, and governmental sectors. Issues and challenges raised during these discussions are addressed in the following sector-focused sections. (In the Authority’s

Table 2. Routine uses of the Internet at home by FORSCOM personnel and their families

Task	Usage
Check mail	98%
Educational (research, course, or Army on-line training)	52%
General information searches (news, weather, sports)	86%
Work, professional information searches (government, business)	72%
Pay utility bills	74%
Pay taxes	33%
Search for medical information	73%
Do job-related tasks	43%
Search for jobs	47%
Commercial activities (shop, pay bills, etc.)	83%

initial report, this information was supplemented by a needs assessment covering the affected counties and sectors.)

A. Public Safety

Normal growth in the Fort Bragg region is already affecting the ability of emergency response agencies to effectively react to catastrophic accidents and natural disasters. This challenge will be exacerbated by the population growth generated by the expansion at Fort Bragg. In addition, there is concern that the threat profile of the region will be significantly elevated as the number of BRAC-related personnel moving into the region increases. Development of a region-wide public safety communication system that is interoperable, real-time, and reliable should be a priority for all the counties in the region.

The Voice Interoperability Plan for Emergency Responders (VIPER) first-responder communication network, managed by the Sate Highway Patrol,⁴ is a state- and federally-sanctioned program that can meet the need for enhanced voice and data connectivity among police, fire, and emergency medical services across the Fort Bragg region. VIPER, which is not meant to replace the existing dispatch and control systems used for routine operations, is

4. More information about the VIPER program is available at <http://www.nccrimecontrol.org/Index2.cfm?a=000001,001148>

implemented by providing all first-responder units with wireless radios programmed to operate at 800MHz. These radios are designed to support direct voice communications between units without the need for a third-party public communications system. Communication is accomplished via signals transmitted from towers strategically placed for this purpose.

At the instigation of the North Carolina Highway Patrol, installation of VIPER towers is currently underway across the region. At least one VIPER tower is installed and operational in Cumberland, Hoke, Moore, Richmond, and Robeson Counties. Towers are under construction in Lee and Harnett counties, with completion scheduled for the third and fourth quarters of 2008, respectively.

The construction of tower infrastructure is only the first step. Radios must be purchased, programmed, and distributed and emergency responders must be trained in their use. Funding for equipment and for the cost of linking local first responders to VIPER is a local responsibility. Participation by county emergency-response units is voluntary. A regional approach to addressing shared problems has yet to be considered. At this time Cumberland, Harnett, Hoke, and Lee Counties have partnered with VIPER or are planning to do so, which means that at least some of their first responders are, or soon will be, equipped with the required 800 MHz radios. Moore, Richmond, and Robeson are among the twenty-seven counties in the state that are not part of the system on any level. Fully equipping all of the currently participating counties' first responders will require the purchase of 4,280 radios at a cost of \$13.91 million (see **Table 3**). Extending the system to include the eleven-county Fort Bragg region would increase the total number of radios needed to 5,605 and would increase total costs to \$18.22 million. A strong argument can be made that, because interoperable first responders directly support the mission of Fort Bragg, requests for federal financial support are appropriate. A proposal seeking federal support for meeting the costs of VIPER implementation throughout the region has, in fact, been submitted. The text of this proposal is included in the Information & Technology appendix.

B. Education

School districts across the region, like school systems nationwide, are facing difficult challenges arising from increasing student populations, inadequate school infrastructure, increasing use of technology in the development and delivery of instructional content, and the need to support “anytime, anywhere”

Table 3. Cost for full implementation of VIPER Communication System in the Tier I counties

County	Cost of Radios
Cumberland	\$4,251,000
Harnett	\$1,901,250
Hoke	\$793,000
Lee	\$1,020,500
Moore	\$1,927,250
Richmond	\$1,017,250
Robeson	\$2,999,750
Total Costs for Tier I counties	\$13,910,000

instruction through distance-learning programs. There already is a rapidly growing demand for broadband Internet access to support the educational and training needs of students in K-12, professional development, and training programs. Several existing statewide initiatives will significantly improve the network through which web-based resources are delivered to the region’s schools.⁵ All of these applications require robust broadband connections at home and at school.

Hardware and Software: Establishing connectivity is only one of the ICT issues facing public schools in the Fort Bragg region. There is a continual need for upgrading of the hardware and software that is required by the BETA project, Earn and Learn, Learn NC, and Impact projects. Even End-of-the-Year testing requires up-to-date computers and

5. Web-based resources available to the counties' schools include distance-learning programs originating with the military and National Guard and designed for their personnel; the Business Education Technology Alliance (BETA) study and state investment in regional education networks; the N.C. School Connectivity Initiative to support K-20 virtual-learning programs; the N.C. School of Science and Mathematics Distance-Learning courses; NC Wise; AMDG; OSU; North Carolina Virtual Public Schools; the Learn and Earn Initiative's online college courses; Two-plus-Two programs that integrate community college curricula with university degree programs; UNC-Greensboro iSchool courses; the UNC Tomorrow program, and even the pioneering web academies.

software. Schools cannot just use donated or other outdated equipment and software but must make ICT equipment a fixture in their annual budgets.

Impact of Connectivity on School Infrastructure:

Enhanced access affects other areas of county school planning. Changes in the construction codes for schools and other public-sector buildings are required to ensure that the affected facilities support the wiring and HVAC needs for additional ICT equipment. During a recent BRAC ICT focus group meeting, for example, representatives of the region’s public schools cited the lack of sufficient electrical outlets in classrooms as a serious challenge to delivering web-assisted instruction.

Impact of Connectivity on School Human Resource Needs:

A shortage of skilled network management technicians may emerge as one of the most critical impediments to meeting the demands of growth in the region. Schools in the Fort Bragg region were surveyed regarding the numbers and types of ICT-support personnel they employed. Although results varied widely and the survey did not attempt to assess the *quality* of the technicians’ training or expertise, the data are none-the-less revealing and raise serious concerns. Each ICT technician in the region serves between 2.2 and 7.7 schools. Still more troubling was the fact that very few of these technicians reported being certified in the LAN/WAN technology that connects each school to the central office. It is clear that more and better trained technical support personnel are needed to manage the school districts’ growing ICT needs. This need for more skilled technicians should be factored into plans for expanding ICT-relevant programs and degree offerings at the region’s community colleges, colleges, and universities. Connectivity profiles for LEAs are provided in Appendix A.

C. Higher Education/Adult Learning

One important means of addressing the technician gap described in the previous section involves taking advantage of the relevant ICT-related educational programs that are offered at area colleges, community colleges, and universities. It is essential that these institutions receive local and regional support and

that their offerings are widely publicized. A listing of relevant degree programs, courses, and administrative contacts for each county’s post-secondary educational institutions is included in Appendix A.

D. Health Care

Digitalized and data-intensive health applications that are coming on-line in the near future are expected to significantly increase bandwidth demands in the health-care sector. An additional challenge in the Fort Bragg region is the need to support information exchange between the different elements of the three-tiered health-care system that serves military personnel, their families, and veterans each at different types of medical facilities.

Telehealth networking offers a cost-effective approach to meeting the challenges of rural health-care provision. A rural health network could connect regional health-related service providers—including public health clinics, free clinics, community hospitals, and private medical practices—with patients in their homes, at work and on the move. Such a network would involve patient portals, mobile monitoring, readily accessible personal health records, home vital-sign monitoring, and a growing list of innovations that all rely on the broadband Internet to connect patients with physicians and other care providers. Development of a regional health network is essential if the region is to adequately meet such critical challenges as (1) treating the growing numbers of wounded soldiers that are returning to the region from the Middle East and putting further strain on an already overtaxed health-care system; (2) providing additional, badly needed hospital beds (the region’s hospital bed shortage is discussed in the Health Care section of this report) and (3) providing resources and training needed to support—and to retain—the region’s medical personnel.

The fact that broadband access is not consistently available to or utilized by the region’s health-care centers significantly limits their access to telehealth applications and benefits (**Table 4**). An especially telling example of how far the region has yet to go in this regard is the fact that four public health departments in the eleven-county Fort Bragg region

still depend on dial-up modems for Internet access. It is highly unlikely that these and other under-equipped departments could participate in telehealth applications that would be of enormous benefit to the communities they serve.

E. Government

Movement of government services to an electronic platform (“e-government”) allows for cost-effective delivery, improved responsiveness, and increased transparency. E-government is proving to be particularly important in that it allows military personnel to access local government services while being deployed. Military-related growth is expected to impact significantly the demand for governmental services. While some county and municipal governments in the Fort Bragg region have made significant strides in developing e-government

created by incoming FORSCOM and US Army Reserve Command personnel and by the enhancement of already existing Base operations. Because rapid response to global and local crises is imperative, military personnel living off-base absolutely must have reliable high-speed access. Improved access would also contribute to the area’s economic development efforts by making the region more attractive to high-tech and other industries.

Extensive suburban housing developments, such as those planned for the area surrounding Jack Britt High School in Cumberland County and Linden Oaks in Harnett County, typically draw broadband service providers interested in recruiting new customers. More rural and isolated developments, however, will find suitable Internet access harder to come by. Local governments across the region could begin to request that developers provide fiber connections to new homes, wherever they are located.

Table 4. Local health department Internet access in the Tier I counties

County	Internet Access
Cumberland	T-1 (ITS)
Harnett	T-1 (ITS)
Hoke	Dial-up Modem
Lee	T-1
Moore	T-1 (ITS)
Richmond	T-1 (ITS)
Robeson	T-1 (ITS)

facilities and services, many others have not. Best-practice models, featuring common portals that can link indigenous and relocating citizens and businesses to local resources, are available to area local governments wishing to improve their e-government services. Web sites in Havelock, NC, (<http://www.cityofhavelock.com/>) and Northwest Florida (<http://www.welcometonorthwestflorida.com/index1.html>) can serve as best practice models for the Fort Bragg region.

III. Gaps

The quality and availability of Internet access in the Fort Bragg region compares reasonably well with state-wide trends. However, the current level of access is insufficient to meet needs that will be

To date, most of the public and private interests responsible for bringing new information and communications technologies to the Fort Bragg area have done so on a comparatively limited, city-wide or county-wide scale. Planners and other stakeholders in this effort would be well advised to use the expansion at Fort Bragg as the occasion for introducing a different and potentially superior approach—that is, a regional approach—to the process of acquiring and utilizing state-of-the-art, Internet-related technologies. Sector- and application-specific regional networks can markedly increase the overall quality of service, compensate for limited technical expertise and training resources, and generate significant cost savings.

Cooperation among local governments would be particularly advantageous in the areas of ICT capacity-building, public safety, and health care. Local governments can benefit, for example, from collectively purchasing—and then sharing in the use of—expensive ICT equipment. Resource sharing could also enable the establishment of important region-wide programs and institutions—a regional public safety council, for example. Such a council could bring a coordinated and thus more effective approach to the solving of public safety initiatives—the training of emergency and other personnel in the

techniques of responding to large-scale disasters, for example. (The need for such training was repeatedly cited in responses to the Public Safety needs assessments conducted as part of this regional planning effort.)

The region would also benefit from formation of a regional health-connectivity council comprised of the Chief Information Officers of all hospitals in the region as well as the Chief Technology Officers for the region's public health centers and free medical clinics. Tertiary health centers such as the Pinehurst Hospital, the Duke Medical Center, UNC Memorial Hospital, Wake Forest Medical Center, Womack Army Hospital, and related military clinics should also be invited to participate. It is possible that a Fort Bragg-centered regional health effort could join forces with similar initiatives under development in the state. An especially promising project might involve efforts (funded by the Federal Communications Council) aimed at planning and piloting new methods of using telecommunications to improve the health of rural citizens. Grants made through this program cover up to 85% of the cost of establishing telecommunications infrastructure in rural regions.

Likewise, K-12 education in the region would benefit from the development and implementation of a digital-education learning council. Such a council could, for example, request funding from the Business Education and Technology Alliance (BETA) and the e-learning Commission to connect each school in the region through a wide-area network of at least ten (and hopefully as many as 100) megabits to a 1-gigabit network.

IV. Recommendations

Critical Action 1: Fully equip public safety and emergency personnel to participate in North Carolina's VIPER first-responder network

Description: The Voice Interoperability Plan for Emergency Responders (VIPER) System being implemented by the North Carolina Highway Patrol will enable public safety officials at all levels to communicate directly with one another over a secure and reliable network without having to relay messages through a communications center. The importance of this capability in times of emergency is increasing as the influx of military personnel into southeastern North Carolina significantly raises the threat profile of the region.

Responsible Parties: Local, state, and federal government partnering to fully implement and equip the network. A request for federal support to equip the Fort Bragg region has been developed by the e-NC Authority for the BRAC RTF; prospects for federal funding are not certain at this time.

Important Action 2: Bring high-speed Internet connectivity access to 95 percent.

Description: Broadband Internet is increasingly the platform on which growth and development in all sectors will be delivered. Making connectivity a cornerstone of its action agenda will support all other elements of the growth plan for the region and for individual counties. This can be supported by developing a proposal to engage the support of federal and state governments to incent private sector partners to connect the region more fully.

Responsible Parties: A partnership of public (federal, state and local) and private (corporate and foundation) organizations.

Important Action 3: Develop a regional ICT Council to guide technology-based economic development in the region.

Description: Harnett County should partner with counties in the region to develop a regional ICT Council comprised of a Chief Information/Technology Officer from each county in the Fort Bragg region to guide development and use of connectivity. Outcomes will include collaborative learning, cost efficiencies realized through joint purchasing agreements and regional software licenses, and more competitive bids for federal and state program support.

Responsible Parties: CIOs/CTOs for each county and Fort Bragg are in the best position to lead this effort.

Important Action 4: Pilot a regional K-20 network and regional Digital Learning Council.

Description: The DLC will leverage resources and sponsor professional development opportunities in instructional technology for teachers at all levels. The Council will work with the BRAC Workforce Demonstration Project to ensure adequate output of trained and certified computer and networks technicians in the region.

Responsible Parties: Leaders from County government and education leaders from public and private schools K-16 in the Fort Bragg region, in collaboration with state BETA and e-learning commission. Federal e-rate funds supplemented with state funds for piloting regional education network.

Important Action 5: Define and develop plans for a regional Health ICT network and establish a regional Health Network Council.

Description: The Council will work with statewide health network planners to ensure connectivity among the region's healthcare providers and to establish joint training programs in the use of web-based applications, upgrade connectivity to public health centers and clinics, and develop a regional health ICT network

Responsible Parties: County government and health leaders in collaboration with the BRAC RTF, e-NC Authority, and NCHICA

Important Action 6: Develop a Government Services best practice portal and train leaders in use of regional GIS resources to manage public services.

Description: County and BRAC regional leaders will work with e-NC and its government and university partners to create regional and local models for sustainable e-government to better serve highly mobile military and established citizens and businesses.

Responsible Parties: BRAC Regional Task Force, county CIOs/CTOs, local government IT directors, the e-NC Authority, the N.C. League of Municipalities, and the Center for Public Technology at the UNC School of Government at UNC-CH.

V. Appendix A—County Connectivity Profiles

Cumberland County

K-12 LEA Connectivity Technical Profile	
LEA Name: Cumberland County	LEA #: 260
Students: 51,663	Number of Schools: 88
Teachers: 3,266	Total Employees: 6,447
State: \$228,096,405.00 Fed: \$50,860,654.00 Local: \$71,435,633.00 Total Budget: \$350,392,692.00	
Annual Cost (TCO): \$954,000.00	eRate % (TP): 71%
WAN Cost (TP): \$.00	eRate \$\$\$ (cal):
Technology Staff (TP): 18	
Type (TP): In-House	
% Outsourced: 1-25%	Out Sourced Vender (TP):
Tech Staff Types (TP): 12 - Technician I, 5 - Technician II, 1 - Technician III	
ISP (AMTR): Time Warner	WAN Type (TP): Fiber
ISP BW (AMTR): 29 / N/A	ISP BW (TP): 33Mbps
WAN BW (AMTR): 100 / N/A	WAN BW (TP): 86 - 100Mbps
Growth Projection (TP): 24Mbps - 3Mbps increase every 3 months	
Monitoring Tool (TP): What's Up Gold, LightSpeed, Etherpeek, Vericept Packeteer 9500, Tipping Point UnityOne-50	Packet Shaping (TP):
Firewall (TP): Cisco Pix 515E	Firewall Mangt. (TP): Self-Managed
Filter (TP): LightSpeed	Proxy (TP): No
Virus (TP): AVG Professional 7.0 - Grisoft	Spam (TP): Tipping Point UnityOne-50
SpyWare (TP):	Intrusion Det. (TP): Tipping Point UnityOne-50

Fayetteville State University	
<p>Department Chairperson(s): Vinod Arya, Dept. Chair Phone: (910) 672-1294 E-mail: varya@uncfsu.edu</p> <p>School IT Director: Nick Ganesan, CIO Phone: (910) 672-1477 E-mail: Nick.Ganesan@uncfsu.edu</p>	<p>Available Technology Programs:</p> <ul style="list-style-type: none"> • B.S. in Management Information Systems, Computer Science (27 graduates in 2007) <p>Current enrollment: 6,072 Number of Graduates (Annually): 833 Annual Enrollment Growth Rate: not available</p>

Methodist University	
<p>Department Chairperson(s): Jane Weeks Gardiner Phone: (910) 630-7158 E-mail: gardiner@methodist.edu</p> <p>Delmas S. Crisp, Jr Phone: (910) 630-7031 E-mail: dcrisp@methodist.edu</p> <p>School IT Director: Samuel J. Clark Phone: (910) 630-7020 E-mail: sclark@methodist.edu</p>	<p>Available Technology Programs:</p> <ul style="list-style-type: none"> • B.S. and B.A. in Computer Science (CSC), • B.S. in Computer Information Technology (CIT) with Business Information Systems Concentration • B.S. in Computer Information Technology (CIT) with Computer Art, Multimedia, and Programming Concentration <p>Current Enrollment: 2100 Number of Graduates (Annually): not available Annual Enrollment Growth Rate: not available</p>

Fayetteville Technical Community College	
<p>Department Chairperson(s): Rosanne Thomas Phone: (910) 678-8323 E-mail: thomasr@faytechcc.edu</p> <p>School IT Director: Roderick Brower Director, Management Information Services Phone: (910) 678-8232 E-mail: browerr@faytechcc.edu</p>	<p>Available Technology Programs:</p> <ul style="list-style-type: none"> • Computer Information Technology • Computer Programming • Business Administration-Electronic Commerce • Networking Technology • Information System Security • Office Systems Technology • Web Technologies • Electronic Engineering Technology • Networking Technology/Cisco Networking Certificate • Networking Technology/Microsoft Networking Certificate • Networking Technology/Novell Networking Certificate • Office Systems Technology/Basic Office Systems Technology • Web Technologies/Server Side Web Programming

	<p>Certificate</p> <ul style="list-style-type: none">• Web Technologies/Web Back-Office Certificate• Web Technologies/Web Basics Certificate• Web Technologies/ Web Management Certificate• Web Technologies/Web Programming Certificate• Computer Information Technology/Computer Technologies• Computer Information Technology/Hardware and Software Certificate• Computer Information Technology/Linux Certificate• Computer Programming/C++ Programming• Computer Programming/COBOL Programming• Computer Programming/Java Programming• Computer Programming/RPG Programming• Computer Programming/Visual Basic Programming• Networking Technology/Cisco Networking Certificate• Networking Technology/Microsoft Networking Certificate• Networking Technology/Novell Networking Certificate• Web Technologies/Server Side Web Programming Certificate• <p>Current Enrollment: not available Number of Graduates (Annually): not available Annual Enrollment Growth Rate: not available</p>
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Harnett County

LEA Connectivity Technical Profile	
LEA Name: Harnett County	LEA #: 430
Students: 16,783	Number of Schools: 26
Teachers: 1,109	Total Employees: 2,086
State: \$75,496,883.00	Fed: \$11,957,498.00
Local: \$20,995,793.00	Total Budget: \$108,450,174.00
<hr/>	
Annual Cost (TCO): \$746,569.32	eRate % (TP): 75%
WAN Cost (TP): \$209,370.24	eRate \$\$\$ (cal): \$157,027.68
Technology Staff (TP): 9	
Type (TP): In-House	
% Outsourced: 1-25%	Out Sourced Vender (TP): Data Networks, Inc.
Tech Staff Types (TP): 1 - Technician I, 5 - Technician II, 3 - Technician III, 1 - LAN/WAN Engineer	
<hr/>	
ISP (AMTR): Sprint	WAN Type (TP): ATM with 2 binded T-1s
ISP BW (AMTR): 12 / N/A	ISP BW (TP): 12Mbps
WAN BW (AMTR): Other / 3	WAN BW (TP): 25 - 3Mbps
Growth Projection (TP): 10-100Mbps connectivity to each site with a 45Mbps connection to the Internet	
<hr/>	
Monitoring Tool (TP): MRTG and PacketShaper	Packet Shaping (TP): Packeteer 4600
Firewall (TP): Sonic Wall Pro	Firewall Management (TP): Self-Managed
Filter (TP): Sonic Wall Pro	Proxy (TP): No
Virus (TP): Symantec	Spam (TP): Barracuda (Vendor Updated)
SpyWare (TP):	Intrusion Detection (TP): No
<hr/>	
Applications: SIMS, Follett, Groupwise, FileMaker Pro, STAR Reader/Accelerated Reader/Star Math, United Streaming Video, ALS, Plato, Study Island, FastForWord, Compass	

Campbell University	
<p>Department Chairperson(s): Dr. Mehdi Sagheb-Tehrani Phone: (910) 814-4356 E-mail: tehrani@campbell.edu</p> <p>Dr. Sun Won Kiu Phone: (910) 893-1848 E-mail: kius@mailcenter.campbell.edu</p>	<p>Available Technology Programs:</p> <ul style="list-style-type: none"> • Computer Information Systems • Computer Science <p>Current Enrollment: not available Number of Graduates (Annually): not available Annual Enrollment Growth Rate: not available</p>

Central Carolina Community College	
<p>Department Chairperson: Dr. Robert Joyce Phone: (919) 718-7347 E-mail: rjoyce@cccc.edu</p> <p>School IT Director: Tommy Holder, Director, Information Technology Phone: (919)718-7367 E-mail: tholder@cccc.edu</p>	<p>Available Technology Programs:</p> <ul style="list-style-type: none"> • Computer Information Technology Degree, • Database Programming Certificate • Software Specialist Certificate • IC3-Internet and Computing Core Certificate • Network Technologist Certificate • Computer Hardware/Troubleshooting Repair Certificate • Network Technology./Infrastructure Certificate (Cisco) • Network Security Certificate • Wireless Networking Certificate • Small Office/Home Office Certificate • Voice Over IP Certificate • Office Systems Technology (AAS Degree or Diploma) • Information and Word Processing Certificate • Receptionist Certificate • Operations Management (AAS Degree or Certificate) • Operations Management Diploma • Business Operations Certificate • Paralegal Technology Degree • Paralegal Technology Diploma • Public Administration (AA S degree or Certificate) <p>Current Enrollment: (2006-2007) Number of Graduates (Annually): (2006-2007) Graduates Annual Enrollment Growth Rate:</p>

Hoke County

LEA Connectivity Technical Profile	
LEA Name: Hoke County	LEA #: 470
Students: 6,708	Number of Schools: 11
Teachers: 406	Total Employees: 875
State: \$30,868,718.00 Fed: \$6,191,633.00 Local: \$6,041,333.00 Total Budget: \$43,101,684.00	
Annual Cost (TCO): \$161,790.84	eRate % (TP): 83%
WAN Cost (TP): \$161,790.84	eRate \$\$\$ (cal): \$134,286.40
Technology Staff (TP): 3	
Type (TP): In-house	
% Outsourced: 1-25%	Out Sourced Vender (TP):
Tech Staff Types (TP): 2-TechI, 1-TechII, 1.5 Engineer	
ISP (AMTR): Sprint	WAN Type (TP): Frame Relay, ATM
ISP BW (AMTR): 6 / 6mb ATM	ISP BW (TP): 6Mbps ATM
WAN BW (AMTR): 1.54 / N/A	WAN BW (TP): 10-T1s, 3Mb ATM
Growth Projection (TP): 12Mb ATM	
Monitoring Tool (TP): Solar Winds	Packet Shaping (TP): PacketShaper 4500
Firewall (TP): Cisco Pix	Firewall Mangt. (TP): Self-Manage
Filter (TP): N2H2	Proxy (TP): No
Virus (TP): Command Anti-Virus & Trend Micro	Spam (TP): Gwava
SpyWare (TP):	Intrusion Det. (TP): No
Applications: NCWise, ISIS Financial Packet, Meal Plus, TIMS	

Moore County

LEA Connectivity Technical Profile	
LEA Name: Moore County	LEA #: 630
Students: 11,598	Number of Schools: 22
Teachers: 825	Total Employees: 1,564
State: \$53,283,737.00 Fed: \$7,745,568.00 Local: \$21,877,880.00 Total Budget: \$82,907,185.00	
Annual Cost (TCO): \$99,000.00	eRate % (TP): 67%
WAN Cost (TP):	eRate \$\$\$ (cal):
Technology Staff (TP): 8	
Type (TP): In-House	
% Outsourced:	Out Sourced Vender (TP):
Tech Staff Types (TP): 8 - LAN/WAN Engineer	
ISP (AMTR): Sprint	WAN Type (TP): Other
ISP BW (AMTR): 12 / N/A	ISP BW (TP): 50Mbps
WAN BW (AMTR): 1.54 / N/A	WAN BW (TP): 1 - T-1s, 2 - Other
Growth Projection (TP): 1000%	
Monitoring Tool (TP): MRTG (LEA), iGlass (Vendor), Wholesale (LEA) Packet Shaping (TP): Packeteer Packetshaper 6500/9500 (LEA)	
Firewall (TP): Sonic Wall Pro, Cisco Pix	Firewall Mangt. (TP): Vendor Managed
Filter (TP): Sonic Wall Pro (Vendor Updated)	Proxy (TP): Bluecoat
Virus (TP): Command Antivirus, Sonicwall AV Updated)	Spam (TP): Barracuda Spam Filter (Vendor Updated)
SpyWare (TP):	Intrusion Det. (TP): Yes
Applications: NCWISE, NOVANET, NCDESK, NCLEARN, HRMS, BPSIPS, TIMS, EPROCUREMENT, TIMEKEEPER	

Sandhills Community College	
<p>Department Chairperson(s): Dr. John Turner, Senior Vice President for Instructional & Student Services Phone: (910) 695-3704 E-mail: turnerj@sandhills.edu</p> <p>School IT Director: Dorothy Savin, Director, Information Services, Phone: (910) 695-3724 E-mail: savind@sandhills.edu</p>	<p>Available Technology Programs:</p> <ul style="list-style-type: none"> • Computer Engineering (AAS Degree or Certificate) • Microcomputer Cert. • Computer Programming (AAS Degree) • Computer Information (AAS Degree) • Desktop Pub. Cert. • Digital Media Cert. • Networking (AAS Degree) • Cisco Cert. • Linux Cert. • Microsoft MCSA • Web Technologies (AAS Degree) • Web Design Cert • Web Programming Cert. <p>Current Enrollment: (2006-2007) 5,100 annual unduplicated Number of Graduates (Annually): (2006-2007) 539 Graduates (559 degrees) Annual Enrollment Growth Rate: 2.50%</p>

Lee County

LEA Connectivity Technical Profile	
LEA Name: Lee County	LEA #: 530
Students: 9,056	Number of Schools: 13
Teachers: 582	Total Employees: 1,137
State: \$40,904,449.00 Fed: \$6,775,350.00 Local: \$11,853,596.00 Total Budget: \$59,533,395.00	
Annual Cost (TCO): \$140,234.28	eRate % (TP): 73%
WAN Cost (TP): \$284,280.00	eRate \$\$\$ (cal): \$207,524.40
Technology Staff (TP): 7.5	
Type (TP): In-House	
% Outsourced: 1-25%	Out Sourced Vender (TP):
Tech Staff Types (TP): 5.5 - Technician II,	
ISP (AMTR): Alltel	WAN Type (TP): HDSL
ISP BW (AMTR): 3 / N/A	ISP BW (TP): 10Mbps
WAN BW (AMTR): 1 / N/A	WAN BW (TP): 5 - Other
Growth Projection (TP):	
Monitoring Tool (TP): Ringsphere	Packet Shaping (TP): Packeteer
Firewall (TP): Cisco Pix	Firewall Mangt. (TP):
Filter (TP): Other	Proxy (TP): Yes
Virus (TP): Symantec Antivirus	Spam (TP): Antispyware
SpyWare (TP):	Intrusion Det. (TP):
Applications: Accelerated Reader, Accelerated Math, Read 180, Study Island, Nova Net, United Streaming, A+,	

Central Carolina Community College	
<p>Department Chairperson(s): Robert Joyce, Computer Information Technology, Chair Phone: (919) 718-7347 E-mail: rjoyce@cccc.edu</p> <p>Ben Johnson, Computer Information Technology & Networking, Lead Phone: 919) 776-5812 x7803 E-mail: bjohnson@cccc.edu</p> <p>Steve Lympany, Engineering Technology, Lead Phone: (919) 718-7283 E-mail: slympany@cccc.edu</p> <p>Jerry Clendenen, Electronics, Lead Phone: (919) 718-7331 E-mail: jclendenen@cccc.edu</p> <p>School IT Director: Tommy Holder Phone: (919) 775-5401 E-mail: tholder@cccc.edu</p>	<p>Available Technology Programs:</p> <ul style="list-style-type: none"> • Computer Information Technology Degree • Database Programming Certificate • Software Specialist Certificate • IC3-Internet and Computing Core Certificate • Network Technologist Certificate • Computer Hardware/Troubleshooting Repair Certificate • Network Technology • Network Infrastructure Certificate (Cisco) • Network Security Certificate • Wireless Networking Certificate • Small Office/Home Office Certificate • Voice Over IP Certificate • Office Systems Technology Degree • Office Systems Technology Diploma • Information and Word Processing Certificate • Receptionist Certificate • Operations Management Degree • Operations Management Diploma • Operations Management Certificate • Business Operations Certificate • Paralegal Technology Degree • Paralegal Technology Diploma • Public Administration Degree • Public Administration Certificate <p>Current Enrollment: not available Number of Graduates (Annually): not available Annual Enrollment Growth Rate: not available</p>

Richmond County

LEA profile is not available

Richmond Community College	
<p>Department Chairperson(s): Johnnie Simpson Phone: (910) 410-1855 E-mail: johnnies@richmondcc.edu</p> <p>School IT Director: Chris Sturdivant Phone: (910) 410-1813 E-mail: chriss@richmondcc.edu</p>	<p>Available Technology Programs:</p> <ul style="list-style-type: none">• Computer Information Technology• Computer Information Technology Certificate• Networking Technology• CISCO Networking Certificate• Office Systems Technology• Office System, Microsoft Application Technician Certificate• Web Design Certificate• Web Technologies <p>Current Enrollment: not available Number of Graduates (Annually): not available Annual Enrollment Growth Rate: not available</p>

Robeson County

LEA Connectivity Technical Profile	
LEA Name: Robeson County	LEA #: 780
Students: 23,843	Number of Schools: 45
Teachers: 1,410	Total Employees: 3,144
State: \$113,501,922.00 Fed: \$23,230,386.00 Local: \$22,839,597.00 Total Budget: \$159,571,905.00	
Annual Cost (TCO): \$1,813,759.44	eRate % (TP):
WAN Cost (TP):	eRate \$\$\$ (cal):
Technology Staff (TP):	
Type (TP): Outsourced	
% Outsourced:	Out Sourced Vender (TP): CoreVantage
Tech Staff Types (TP):	
ISP (AMTR): Time Warner	WAN Type (TP): Fiber
ISP BW (AMTR): 90 / N/A	ISP BW (TP): 90Mbps
WAN BW (AMTR): 1.54 / N/A	WAN BW (TP): 16-Gbit
Growth Projection (TP):	
Monitoring Tool (TP):	Packet Shaping (TP):
Firewall (TP): Cisco Pix	Firewall Mangt. (TP): Time Warner Cable
Filter (TP): BlueCoat	Proxy (TP): BlueCoat
Virus (TP): Command Anti-Virus	Spam (TP): Yes
SpyWare (TP):	Intrusion Det. (TP): Tipping Point Unity

University of North Carolina at Pembroke	
<p>Department Chairperson(s): William H. Campbell, Dept. Chair bill.campbell@uncp.edu Phone: (910) 521-6244</p> <p>Stephen Bukowy, Dept. Chair Phone: (910) 521-6668 E-mail: stephen.bukowy@uncp.edu</p> <p>School IT Director: Robert Orr, CIO and Associate Vice Chancellor for Information Resources Phone: (910) 521-6883 E-mail: robert.orr@uncp.edu</p>	<p>Available Technology Programs:</p> <ul style="list-style-type: none"> • Business Administration - Information Technology Management (BS) • Computer Science (BS) <p>Current Enrollment: not available Number of Graduates (Annually): not available Annual Enrollment Growth Rate: not available</p>

Robeson Community College	
<p>Department Chairperson(s): Mark O. Kinlaw, Vice President for Instruction and Support Services Phone: (910) 272-3300 E-mail: mkinlaw@robeson.cc.nc.us</p> <p>School IT Director: Connie Ivey, Assistant Vice President of Computer Information Systems Phone: (910) 272-3560 E-mail: civey@robeson.cc.nc.us</p>	<p>Available Technology Programs:</p> <ul style="list-style-type: none"> • Computer Information Technology • Office Systems Technology <p>Current Enrollment: not available Number of Graduates (Annually): not available Annual Enrollment Growth Rate: not available</p>