

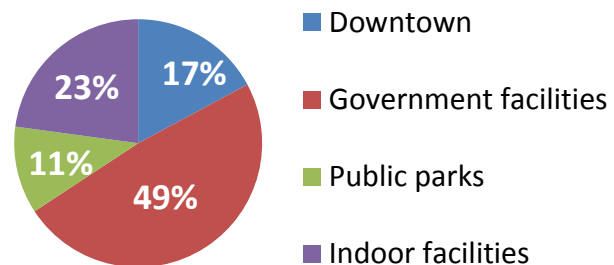
North Carolina Public Wi-Fi Networks

Last fall, NC Broadband, a division of the North Carolina Department of Commerce, conducted a state-wide survey to gather more information about local public Wi-Fi networks. The survey was disseminated over the NCLGISA (North Carolina Local Government Information Systems Administration) listserv and was advertised during the fall NCLGISA conference, which brings together local government information technology professionals from across the state.

Results

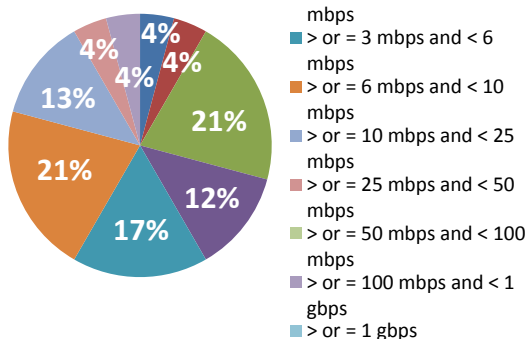
Of the 50 respondents who started the survey, 40 have a public Wi-Fi network in their community. Most networks serve the area in and around government facilities, but some also include the downtown and nearby parks or other indoor facilities.

Network Service Area

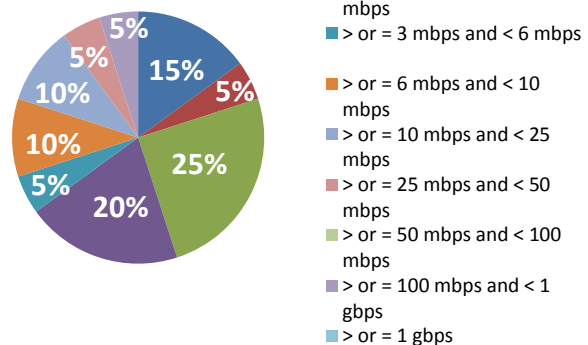


The speeds offered by the networks vary, with download speeds mostly falling between 768 mbps and 10 mbps and upload speeds between 768 mbps and 3 mbps.

Download Speeds



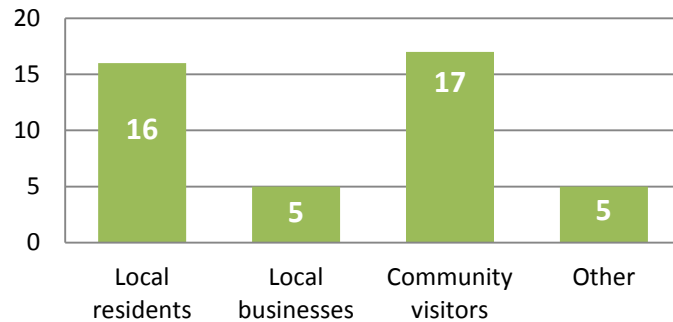
Upload Speeds



If you have any questions regarding the above examples or any networks listed in the below chart, please contact Samantha Jackson at srjackson@nccommerce.com or 919-715-0830.

Network Customers

The survey also found that the majority of networks are for the use of local residents and community visitors, which may serve as a tourism tool. Some respondents also cited library patrons and school children as network users.



Aside from the general location, speeds, and audience of each network, the respondents listed network attributes that are unique to the community’s needs and budget, so the details of each project can be found in the attached chart. Due to the number of survey questions, the communities are repeated into four sets within the chart.

Wi-Fi Network Examples

Beaufort County

Beaufort County Community College is the only grant funded Wi-Fi network in the survey responses. Their funds came from the North Carolina Advanced Manufacturing Alliance for hardware and the North Carolina Community College System office fund for communications and support. The college’s network covers about four square miles, which encompasses 12 buildings and all parking lots on campus. This network has also the fastest speeds reported, with between 100 mbps and 1 gbps download and upload speeds. The college uses MERU for access points and backhaul radios, and works on a mesh topology. The college manages the network in-house; CenturyLink and MCNC provide the Internet service, depending on whether the network is being accessed by a student or the public.

City of Greensboro

The City of Greensboro Wi-Fi network covers about one square mile in the downtown area. The network is free for use by community visitors and anyone attending council meetings, the library or downtown park. The network is also used for the downtown surveillance cameras. The city uses Cisco equipment and delivers service via a single access point and mesh topology. The city manages the network; Time Warner Cable provides the Internet service via the government network. A lesson learned from the city regarding public Wi-Fi networks is that if the community does not manage the network, it can start consuming available bandwidth for internal employee use. The city also recommends disabling peer-to-peer sharing and other bandwidth consuming applications. Based on these lessons learned, if the city were to set up the network now, they would use a system with two separate Internet connections.

If you have any questions regarding the above examples or any networks listed in the below chart, please contact Samantha Jackson at srjackson@nccommerce.com or 919-715-0830.

Community	If the network serves an outdoor space, approximately how large of an area can receive service?	What is the Internet connection speed for the user? (Download)	What is the Internet connection speed for the user? (Upload)	Who is the service primarily trying to reach?
Beaufort County	4 sq miles (est) (12 buildings and all parking lots on campus (140 AP)	Greater than or equal to 100 mbps and less than 1 gbps	Greater than or equal to 100 mbps and less than 1 gbps	College Students, College Visitor, Library Patron
Chapel Hill	One square mile	Greater than 200 kbps and less than 768 kbps	Less than or equal to 200 kbps	Local residents, Community visitors, children in city's public schools
Christiansburg		Greater than or equal to 6 mbps and less than 10 mbps	Greater than or equal to 6 mbps and less than 10 mbps	Local residents, Community visitors
Currituck County	50 feet	Greater than or equal to 3 mbps and less than 6 mbps	Greater than or equal to 768 kbps and less than 1.5 mbps	Community visitors
Davidson County	NA	Greater than or equal to 6 mbps and less than 10 mbps	Greater than or equal to 768 kbps and less than 1.5 mbps	Library patrons
Davidson County		Greater than or equal to 768 kbps and less than 1.5 mbps	Greater than or equal to 768 kbps and less than 1.5 mbps	Local residents, Community visitors
Duck	One square mile	Greater than or equal to 768 kbps and less than 1.5 mbps		Community visitors
Gastonia		Greater than or equal to 768 kbps and less than 1.5 mbps	Greater than or equal to 768 kbps and less than 1.5 mbps	Community visitors
Greensboro	One square mile	Greater than or equal to 3 mbps and less than 6 mbps	Greater than or equal to 3 mbps and less than 6 mbps	Public and news media attending council meetings, library patrons and parks and cameras in the downtown area
High Point	1/2 square mile	Greater than or equal to 25 mbps and less than 50 mbps	Greater than or equal to 25 mbps and less than 50 mbps	Local residents, Local businesses, Community visitors
Kernersville	Only a small area just outside five buildings in Town.	Greater than or equal to 10 mbps and less than 25 mbps	Greater than or equal to 10 mbps and less than 25 mbps	Local businesses, Community visitors
Knightdale		Greater than or equal to 1.5 mbps and less than 3 mbps	Greater than or equal to 1.5 mbps and less than 3 mbps	Community visitors
Newton	My wifi is downtown and along main highways. If I had to guess it covers 3 square miles.	Greater than or equal to 1.5 mbps and less than 3 mbps	Greater than 200 kbps and less than 768 kbps	Local residents, Local businesses, Community visitors
Not Indicated		Greater than or equal to 768 kbps and less than 1.5 mbps	Less than or equal to 200 kbps	Local residents
Not Indicated		Greater than or equal to 6 mbps and less than 10 mbps	Greater than or equal to 1.5 mbps and less than 3 mbps	Local residents
Not Indicated		Greater than or equal to 768 kbps and less than 1.5 mbps		Local residents
Not Indicated	Just around the local libraries. Not more than the parking lot, outside seating areas, ...	Greater than or equal to 10 mbps and less than 25 mbps	Greater than or equal to 10 mbps and less than 25 mbps	Local residents, library patrons, other guest in county facilities
Not Indicated		Greater than or equal to 3 mbps and less than 6 mbps	Greater than or equal to 1.5 mbps and less than 3 mbps	Local residents, Community visitors
Not Indicated		Greater than or equal to 6 mbps and less than 10 mbps	Greater than or equal to 6 mbps and less than 10 mbps	Local residents, Community visitors

Not Indicated		Greater than or equal to 3 mbps and less than 6 mbps	Greater than or equal to 768 kbps and less than 1.5 mbps	Local residents, Local businesses, Community visitors
Onslow County		Greater than or equal to 6 mbps and less than 10 mbps		Local residents
Reidsville	One square mile	Less than or equal to 200 kbps	Less than or equal to 200 kbps	Local residents, Local businesses, Community visitors
Wake County		Greater than or equal to 10 mbps and less than 25 mbps		Local residents, Community visitors
Winterville		Greater than or equal to 1.5 mbps and less than 3 mbps	Greater than or equal to 1.5 mbps and less than 3 mbps	Local residents, Community visitors
Community	Who is the Internet service provider?	What is the brand name of the access points and backhaul radios used? (Example: Cisco, Aruba, Meraki, Netgear, Linksys, Ubiquity etc.)	What topology is used for the Wi-Fi network?	Who owns the equipment?
Beaufort County	CenturyLink and MCNC/NCREN (depends on user (student/faculty/patron or guest))	MERU	Mesh	Beaufort County Community College
Chapel Hill	AT&T, TWC, Clear.	Open-mesh Wi-Fi routers. Backhaul is either DSL, RoadRunner, or ClearWire.	Mesh	Town
Christiansburg	Citizens Coop	Aruba	Multiple independent access points	Town
Currituck County	CenturyLink	Netgear	Multiple independent access points	County
Davidson County	Time Warner	Netgear, Linksys	Multiple independent access points	County
Davidson County	Time Warner Cable	Meru	Multiple independent access points	County
Duck	Charter	Meraki	Multiple independent access points	The Town
Gastonia	Time Warner Cable and Windstream Communications	AP's - Meraki, Back haul - AirSpan	Mesh	City of Gastonia
Greensboro	Time Warner	Cisco	Single access point and mesh	City of Greensboro
High Point	North State Communications	Meraki	Mesh	City of High Point
Kernersville	Century Link	Meru	Mesh	Town
Knightdale	Wake county, Time Warner	Meraki	Multiple managed access points	Town of Knightdale
Newton	I'm not sure. The county provides the service.	Meraki and Ubiquity	Hybrid mesh and point to multipoint	City
Not Indicated	telco windstream	cloudtrax	Multiple independent access points	County
Not Indicated	Charter, CenturyLink	Cisco, sonicpoint	Multiple independent access points	County
Not Indicated	Frontier	Aruba	Mesh	IT dept
Not Indicated	TWT	Aruba	Multiple independent access points	County
Not Indicated	Skyline Telephone	Meraki	Mesh	County

Not Indicated	Time Warner	Cisco	Multiple independent access points	Town
Not Indicated	Skyline Telephone	Meraki	Mesh	We do
Onslow County	Century link, time-warner	Cisco, Ubiquity	Multiple independent access points	County
Reidsville	AT&T	Meraki, Ubiquity, Cisco	Multiple independent access points	City
Wake County	Time Warner	CISCO	Multiple independent access points	Outsourcer
Winterville	Centurylink	Ruckus	Mesh	Government
Community	Does the public Wi-Fi network connect to the Internet via a government network or does the network have a separate Internet connection?	Is the Wi-Fi network managed in-house or is it outsourced?	If the network is outsourced, please list the name of the company that maintains the network:	Is this service advertised by the local government?
Beaufort County	Public Wi-Fi connects via a separate Internet connection	In-house	N/A	No
Chapel Hill	Public Wi-Fi connects via a separate Internet connection	In-house	N/A	No
Christiansburg	Public Wi-Fi connects via a government network	In-house	N/A	Yes
Currituck County	Public Wi-Fi connects via a separate Internet connection	Both		No
Davidson County	Public Wi-Fi connects via a separate Internet connection	In-house	N/A	No
Davidson County	Public Wi-Fi connects via a government network	In-house	N/A	Yes
Duck	Public Wi-Fi connects via a government network	In-house	N/A	Yes
Gastonia	Public Wi-Fi connects via a government network	In-house	N/A	Yes
Greensboro	Public Wi-Fi connects via a government network	In-house	N/A	Yes
High Point	Public Wi-Fi connects via a separate Internet connection	Both	H.ITS	Yes
Kernersville	Public Wi-Fi connects via a government network	In-house	N/A	No
Knightdale	Public Wi-Fi connects via a government network	In-house	N/A	No
Newton	Public Wi-Fi connects via a government network	In-house	N/A	Yes
Not Indicated	Public Wi-Fi connects via a separate Internet connection	In-house	N/A	No
Not Indicated	Public Wi-Fi connects via a government network	In-house	N/A	No
Not Indicated	Public Wi-Fi connects via a government network	In-house	N/A	No

Not Indicated	Public Wi-Fi connects via a government network	In-house	N/A	Yes
Not Indicated	Public Wi-Fi connects via a government network	In-house	N/A	No
Not Indicated	Public Wi-Fi connects via a government network	In-house	N/A	No
Not Indicated	Public Wi-Fi connects via a government network	In-house	N/A	No
Onslow County	Public Wi-Fi connects via a government network	In-house	N/A	No
Reidsville	Public Wi-Fi connects via a government network	In-house	N/A	Yes
Wake County	Public Wi-Fi connects via a separate Internet connection	Outsourced	Anaptyx	Yes
Winterville	Public Wi-Fi connects via a government network	Both	IPC Technologies	Yes
Community	Is the public Wi-Fi open and unsecured or does it require a password?	Does your local government have a public Wi-Fi acceptable use policy?	What have been the biggest lessons learned from setting up and operating this network?	Would you set the network up in the same way if you were to do it over? Why or why not?
Beaufort County	Password required	Yes	Plan and walk-thru and not to rely on computer generated models to locate APs	Yes
Chapel Hill	Open/unsecured	No	Not as easy to implement as it seemed at the outset. Requires less support than other lines of business.	No. I would use a teared topology, not mesh, as it affords much more granular interactions with endpoints and fewer Internet up links.
Christiansburg	Open/unsecured	Yes	Even though it's a guest service, it can become very important to the users. Many start to rely on it.	Yes
Currituck County	Open/unsecured	No		
Davidson County	Open/unsecured	No	Need lots of power strips/power for laptops.	Yes
Davidson County	Open/unsecured	Yes	Define your coverage areas upfront with consideration for expanded coverage.	Yes
Duck	Open/unsecured	Yes	It is only 6 months old so we don't have much data at this point.	Yes
Gastonia	Open/unsecured	Yes	The back haul did not function as advertised. Do not let administration force you into an untested technology to fit their timeline.	No. We are using a WiMax back haul to WiFi units. The technology was not ready for commercial sale. The equipment is problematic.

Greensboro	Open/unsecured	Yes	Network can start consuming your available bandwidth for internal employee use. Also, disable peer to peer sharing and other bandwidth consuming applications.	Probably not. I would have a total separate network with a separate Internet connection for public Wi-Fi.
High Point	Open/unsecured	Yes	There are many options out there. Do your homework.	Yes. It is very cost effective and reliable.
Kernersville	Open/unsecured	Yes	There is more bandwidth requirements from mobile devices than traditional laptops so plan accordingly.	Yes. The Meru product provides us with the features needed to provide open and secured wifi with the same devices and more easily manage those devices.
Knightdale	Open/unsecured	No	Don't allow too much bandwidth	Yes
Newton	Open/unsecured	Yes	Mounting and power outdoor devices.	Yes, given the same funding or lack of.
Not Indicated	Open/unsecured	No		
Not Indicated	Open/unsecured	Yes		
Not Indicated	Open/unsecured	Yes	Limit acces to areas that the public doesn't obviously need it (such as public health center).	Yes. Limited wireless puts us in a position of not competing with private services in the future.
Not Indicated	Open/unsecured	No	Significant demand	Yes, it is simple, easy and cost effective to provide the service (most of the cost, 80%, is federally funded by e-rate)
Not Indicated	Open/unsecured	Yes		Yes
Not Indicated	Open/unsecured	Yes		
Not Indicated	Open/unsecured	Yes		
Onslow County	Open/unsecured	No	Managing bandwidth	We'd start with ubiquity equipment
Reidsville	Open/unsecured	Yes		
Wake County	Open/unsecured	Yes	No issues - works well	Yes
Winterville	Open/unsecured	Yes	You should be sure that management components are as stated and centralized between all devices as much as possible. The business partner you choose matters almost as much as equipment, make sure to do your homework. Remember that you can save a lot of money by participating actively in the project and not outsourcing all components.	Not known yet, sure some will be revealed.