



..... *Beyond Access*

Broadband Adoption: the Other Half of the Digital Divide

Huntsville, Alabama

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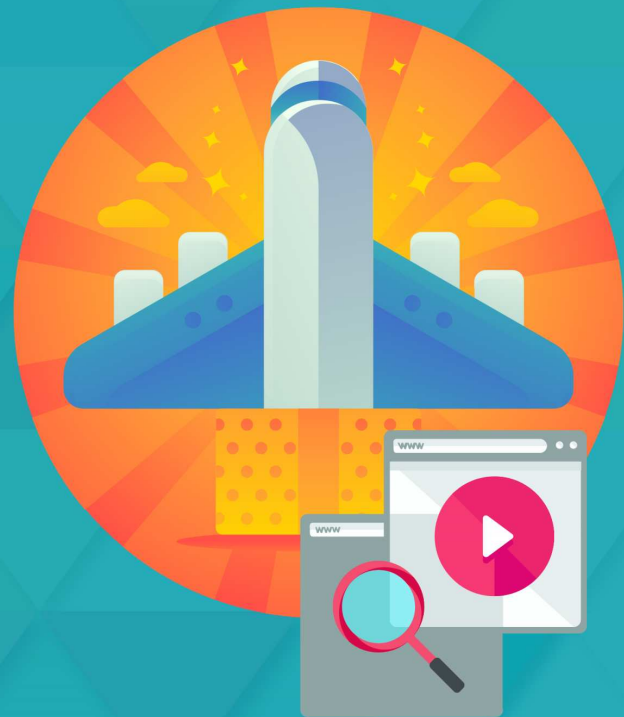
Introduction

With approximately 200,000 residents, Huntsville is the second largest city in Alabama. It houses the brain power and imagination that fuels NASA's space flight center and the U.S. Army's missile command. Research and engineering are an integral part of the City's legacy. Long before they were known as a GIG City, residents and small businesses complained about expensive, unreliable internet connectivity. In this technology hub, broadband access is an expectation, much like access to clean water and electricity. However, today, broadband access is still unequal.

The qualitative data in this report was gathered from interviews with local community leaders, public sector employees, and private sector representatives working in the information and technology sector as well as in philanthropy. In addition to U.S. Census Data, the statistics in this report were gathered from City of Huntsville and Huntsville Utilities' annual budgets. Lastly, this case study relies upon press releases, State of Alabama legislative publications, and local news accounts in order to unveil the current state of the city's digital divide.

The following recommendations could improve broadband adoption for Huntsville residents:

- **The City of Huntsville should expand free digital literacy training programs.**
- **City Public Schools should partner with the County Public Library to enroll the parents into workforce development programs.**
- **Higher education institutions in the area could help collect data, analyze research, and make recommendations on broadband adoption, particularly digital literacy.**
- **Public and private partnerships are essential for providing devices to households with a demonstrable need.**
- **City Public Schools could develop partnerships with higher education institutions to connect student volunteers with teachers and parents who need assistance with virtual learning software.**
- **The public library system should receive additional funding for the surge in need for hotspot devices.**



The 2018 Alabama Broadband Accessibility Act was an important step in which the state government generated momentum to improve connectivity by permitting use of other federal and state support, including loans and grants, to improve broadband access.

Key Facts

- The City is working to install wireless transmitters and receivers that will help to improve coverage and data transfer speeds for Huntsville residents, particularly in the areas with the highest levels of density wherein devices currently compete for bandwidth.
- While over 80% of Huntsville's population has access to fixed or wireless connectivity, 11.5% of all households do not have a home internet connection of any kind. Almost 8% rely solely on cell phone internet connections.
- Despite making inroads in broadband access, obstacles to adoption perpetuate Huntsville's digital divide. The residents most likely to struggle with digital tools and literacy are also struggling with poverty. For those residents in particular, libraries provide essential and equitable digital services.



Broadband Solutions That Go Beyond Access



Sunday mornings are gameday in the Davis household. Pastors Errol and Jennifer Davis (pictured below) are a husband and wife ministerial team at the New Beginnings Christian Church (NBCC) in Huntsville Alabama. In a state wherein roughly 88% of the population identifies with a religious identity and just over 50% of people are estimated to attend a religious service at least once a week, Sunday morning church services are as central to the household weekly routine as going to the grocery store or to a favorite restaurant.

For 13 years, the Davis family has provided a space for Huntsville residents to worship, pray and develop a meaningful faith community that can help foster deep relationships, intellectual or emotional stimulation, and local community initiatives. However, the normal early morning Sunday routine in the Davis household has been amended by an unwelcome guest: COVID-19. And NBCC was not fully prepared to transition all of its activity to the worldwide web.



The pandemic forced NBCC to shift to a programming model that is primarily virtual, with sermons, worship services, and Bible studies being streamed into the homes of its now decentralized congregation. Some congregants did not have equal access to broadband and digital tools. Disparate levels of internet adoption within their congregation created a mild learning curve for the NBCC pastoral team as they worked to keep membership engaged with services and with one another.



Social Gaps in Huntsville's Broadband Infrastructure



ADTRAN, Huntsville Utilities and the Huntsville Committee of 100 worked with Huntsville City Schools in Spring 2020 to provide parking lot wifi connectivity to 37 schools. **Photos Courtesy of ADTRAN**

For many who are familiar with Huntsville, it is the city's impressive and world-renowned aerospace engineering legacy that often comes to mind. It possesses the second largest research park in the United States.¹ Dubbed as the "Rocket City," Huntsville in the 1960s transformed from a U.S. Army chemical munitions production hub into an epicenter for the Apollo space program. Decades before policymakers and researchers began to discuss Alabama's digital divide, Huntsville became the first city in the state to end a different social inequity—legalized racial segregation of public accommodations.²

In February 2016, Mayor Tommy Battle and Huntsville Utilities CEO Jay Stowe announced a new municipally-owned fiber network.³ The use of fiber cables for residential connectivity was scaled out across Huntsville's 218 square miles, allowing private internet service providers ("ISP") to lease their fiber infrastructure and improve connectivity for hundreds of thousands of residents and guests through private home connections.

In order to implement this new fiber network infrastructure, Huntsville Utilities invested \$54,258,296 between 2017 and 2019. Likewise, the budget expenditure for the City's Information and Technology services increased by 20% from \$6,200,452 in 2015 to \$7,458,828 in 2019.

"Before we embarked on becoming a GIG City, we heard the frustration from not only our citizens but also from small businesses about how expensive and how insufficient the offerings were. We don't get those phone calls now," says Harrison Diamond, the City of Huntsville's Business Relations Manager.





Policy Momentum at the State Level

In Alabama's state government, there is bipartisan momentum to dramatically improve broadband connectivity. In 2018, Governor Kay Ivey signed the Alabama Broadband Accessibility Act into law, broadening "the permitted use of other federal and state support, including loans and grants" to improve broadband access in rural areas of the state. Amended in 2019, the Act established the Alabama Broadband Accessibility Fund, which includes appropriations from the Alabama legislature as well as gifts, grants, and donations for the Fund. Notably, the Act provides for grant awards to non-governmental entities, including cooperatives, corporations, limited liability companies, partnerships, and private business entities that provide broadband services. It does not, however, expand the authority of Alabama's local governments to provide broadband service.⁴

House Bill 187, an appropriations bill that passed on May 9, 2020, allocates \$20,000,000 for the State's Rural Broadband Grant and \$5,000,000 for its Research and Development Grant Program.⁵

In May 2020, Governor Kay Ivey awarded \$5.1 million in grants to expand high-speed internet in rural areas. "Mediacom Southeast and New Hope Telephone Cooperative Inc. were given a combined \$122,000 to provide high-speed internet in Berkley and Beth Drive," cities which are both about a 20-minute car ride from Huntsville within Madison County.⁶

Mayor Battle's administration, meanwhile, seeks to build upon its 2016 fiber network upgrade by developing municipally-owned and managed small cell infrastructure. The installation of these wireless transmitters and receivers will help to improve coverage and data transfer speeds for Huntsville residents, particularly in the areas with the highest levels of density wherein devices currently compete for bandwidth.



"Having widespread broadband is vitally important to our economic competitiveness. We need to be able to attract the best and the brightest. The best and the brightest expect there to be great connections," reflects Diamond. "We also know that working from home is going to be more important not just because of COVID19, but also due to changes in the way work is done. We can deliver that infrastructure now to meet those needs."

Broadband Adoption

The other half of the Divide

Despite efforts to improve broadband access, broadband adoption still persists as a stubborn obstacle to closing Huntsville's digital divide. According to the 2018 American Community Survey, approximately 77.7% of the city's 88,848 households subscribe to high-speed broadband using residential cable, fiber, or DSL connections.⁷ Similarly, 77% of Huntsville households have a desktop computer while 87% of households have access to a smartphone device, allowing the majority of residents to be able to get online.

7.7%

of 75,054 households in Huntsville
with an internet connection rely solely
on cell phone internet connections

but

11.5%

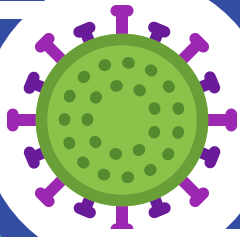
of all households in the city
have no home internet
connection of any kind

Like other cities, household income is the controlling variable in broadband adoption rates. For instance, amongst the roughly 16,600 Huntsville households who earn less than \$20,000, 27.6% (4601 households) have no home internet connection of any sort. Considering that housing and public school demographics often correlate with household income levels, the 4601 households who earn below \$20,000 and have no internet subscription of any sort are likely to be concentrated near one another within Huntsville's low-income neighborhoods.⁸

These adoption statistics may be frustrating for city officials who have successfully developed relationships with private internet service providers to increase access to high-speed internet subscriptions. And yet, the reality of 11-36% of Huntsville households possessing either no internet subscription or who can only access the internet at home on their cell phones indicates a need for adoption programming. The same type of innovation that helped expand access could be used to identify resources and community-level partnerships that will increase adoption.

Positioned for Success or Failure -

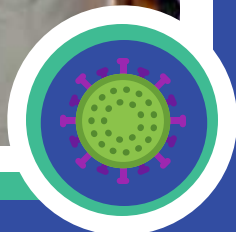
COVID-19's Reinforcement of an Existing Divide



Back at New Beginnings Christian Center, Pastor Errol Davis began to notice that while some churches were well positioned to take on the challenges that Huntsville's faith communities would experience during the COVID-19 pandemic, other congregations were struggling to remain connected. He explained, "Prior to COVID, our church had already been utilizing online giving platforms for tithes and offerings. So while we have noticed a slight drop-off from our normal levels of financial support, I know that other churches are having a more difficult time."

The pandemic has exacerbated challenges that faith communities with older or less affluent members were already facing prior to the pandemic. Churches that were slow to adopt streaming technology for services and classes, as well as social media communications are said to be having a more difficult time with these technologies now that they're being forced to, according to Pastor Davis. "Our average age is around 35-40 years old. So while some of our older members struggled to make the switch to Youtube, Facebook and Google Hangouts, many in our congregations made the transition pretty easily."

NBCC, which Davis describes as pretty "middle-class," is located in the North side of Huntsville like many of its fellow predominantly African American churches. Nationally, according to the Pew Research Center, "some 46% of blacks and 48% of Hispanics say training to help them be more confident in using computers, smartphones and the internet would help 'a lot' in terms of making important decisions, compared with 20% of whites."⁹ Moreover, lower income households of any race typically struggle to adopt the internet due to greater reliance on smartphones which are less efficient than laptop computers for many tasks.¹⁰



Public-Private Partnerships Prove Critical With Arrival of COVID-19

COVID-19 sent shockwaves throughout school systems across the United States, prompting school officials to scramble and shift classroom curriculums to online learning environments that students could access from their homes. Huntsville was no exception.

Somewhat early into the pandemic, the Huntsville Public Schools benefited from a partnership with telecommunications networking hardware provider, ADTRAN, and Huntsville Utilities that resulted in the installation of access points in the parking lots of 35 schools. These access points provide Huntsville students WiFi coverage for about 300 yards from the access points.

“Connectivity is more important during COVID-19 than it’s ever been. Huntsville schools were already working on finding a solution to deliver better broadband to its students, teachers, and staff. This project with ADTRAN was essential in allowing them to achieve that,” remarks Gary Bolton, the Vice President of Global Marketing at ADTRAN. “Connecting communities is what ADTRAN is all about – whether through wireless or fiber. For Huntsville schools, better connectivity will positively impact the education of its students today and in the future.”

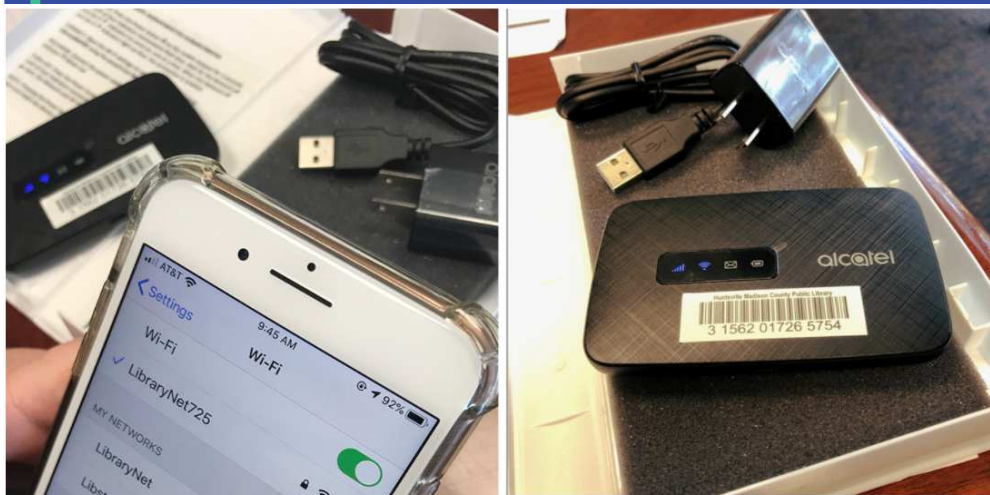
In addition to its parking lot WiFi zones, seven school buses were mounted with WiFi access points and positioned in various locations throughout the city so that students from the 9,752 Huntsville households that are estimated to lack a home-based internet connection could download and upload assignments from 10 a.m. to 2 p.m.

However, prior to the pandemic affecting broadband access for students, local leaders in the city had already taken a series of steps to increase home connectivity for students. In 2017, T-Mobile partnered with Huntsville Public Schools and the Huntsville Madison County Public Library through its EmpowerED program which provided an initial 3,000 T-Mobile hot spots for “use, free of charge, to support learning anywhere and anytime.”⁴¹ Participating households needed to have a student enrolled in Huntsville City Schools and “be identified under the free/reduced lunch status” through the State of Alabama’s Direct Certification Program in order to qualify.

In 2018, Google Fiber in partnership with the Community Foundation of Greater Huntsville (CFGH), launched the Digital Inclusion Fund to support digital inclusion efforts in the City of Huntsville. In February of that year, the Community Foundation convened a community conversation of stakeholders and potential partners in order to develop a definition of digital inclusion, identify gaps and barriers to service, and generate a list of priorities for a new Digital Inclusion Fund.

To date, Google Fiber has contributed \$225,000 to the Fund, which has been granted out to twenty-four local nonprofits and organizations. Of these grants, eight were awarded in June 2020 for a total of \$70,000 with the specific intent of supplying “K-12 students in Huntsville, Alabama with devices and mobile internet [and] to support distance learning as a result of COVID-19.”¹² Awarded proposals ranged from supporting “online tutoring and access to educational resources by providing Google Chromebooks for K through 2nd grade students” to “increasing Internet connectivity from home by providing hotspots for English Language Learners.”¹³

School officials for both Madison City and Huntsville City Public school systems will be using their respective allotments from the \$100 million in federal aid recently allocated to the Alabama Board of Education for remote learning initiatives to improve student adoption rates at home. Increasing internet access for parents and families and students is one of the objectives being explored by Huntsville City Schools Superintendent Christie Finley and her staff.¹⁴



Demand for hotspot device rentals from the Huntsville-Madison County Library (pictured left) outpaces their supply.

Photos Courtesy of Huntsville-Madison County Library



A critical aspect of the CFGH's Digital Inclusion Fund is the support it provides for internet adoption initiatives. Broadband adoption, unlike access, results from Huntsville residents being empowered to engage with online tools once internet connectivity is made available. In a city that has installed new fiber infrastructure and whose internet service providers offer special internet subscriptions as low as \$10 per month for those that qualify, a significant 19% of Huntsville households rely solely on a mobile phone internet data plan or have no internet access at all. Just over 16% of households lack desktop computer access.

The Huntsville Madison County Public Library received a 2018 Digital Inclusion Fund grant of \$7500 for a "workforce development lab with mobile capability," assisting "those who need digital assistance to secure employment or job advancement." This workforce development program added an adoption component that complemented its existing services that improve broadband access.

At the city's Downtown library branch, Anthony Hale, who oversees the workforce development lab program, has created video tutorials that guide viewers through various online platforms that will help viewers to access employment opportunities and make participants more effective and productive within current and future job roles. In addition, Anthony and his colleagues who supervise onsite computer labs, including one enclosed lab with a play area for young children accompanying their parents, have been able to develop hundreds of touchpoints with a diverse array of Huntsville residents within a single month. These interactions give them a strong understanding of how policies and programs actually close the City's digital divide.



"We get all types of folks here at the Downtown branch," reflects Hale. "Some guests are homeless and in need of a safe space as much as they are in need of internet access. Other guests come in with their own devices and are just looking to use our WiFi network, our quiet workspace, or printers. However, there are others who not only rely on our computers, but need very basic assistance in order to navigate the internet. Most recently, we had a number of guests use our computers to access their 2020 Cares Act stimulus checks. I had to provide very hands on assistance and explain concepts such as a 'permanent mailing address.' These are concepts that many others would not find complex at all."

"Time and again we see people with little to no computer experience come through our doors needing to fill out online forms to look for jobs, apply for housing, or be seen at clinics—actions that in many cases are impossible without a computer. Public libraries work against this growing digital divide by providing wireless internet, public computers, and, when possible, direct training and assistance - all for free" explains Jake Cornelius, the library's Information & Business Center Manager.



"Working in a public library, each day further reinforces the idea that internet access and digital literacy are fundamentally required to function in this society. However, the unfortunate truth is that a significant percentage of the populace is missing that access and literacy."

COVID-19 physical distancing restrictions demonstrated that Huntsville residents without internet access at home would go to great lengths to access a broadband connection. While the public libraries closed their doors in March, before reopening with occupancy restrictions on May 4th, the library's management kept their WiFi networks on so that individuals could access the internet from library parking lots. During this period, there were still over 4500 logins into the library's WiFi network. As of June, after reopening, that number had climbed to over 10,000 logins. Meanwhile, in June 2020, there were 429 rentals of mobile hotspot devices and 136 hold requests for a rental once a device became available. Just 300 of these devices are available for rent throughout the system.



Going forward the Huntsville Madison County Public Library and the Huntsville City Public Schools should further explore whether federal E-Rate and Lifeline programs could help support broadband connectivity for residents.

The Federal Communication Commission's E-Rate program could help schools and libraries in Alabama to obtain affordable broadband. Lifeline is a federal subsidy designed to help low-income families get connected and to remain online.¹⁵



TAKING

THE

NEXT

BIG

STEPS



Paraphrasing a line from an ancient Christian text, which Reverend Davis and many others in town may be familiar with, Huntsville leaders must do their best, in this race of closing the city's digital divide, to "fight the good fight and keep the faith".¹⁶

COVID-19 has shown that access-minded projects must be complemented with adoption-focused programs and partnerships. Increased funding for digital literacy development and training will help more of the 11% of Huntsville households without internet access to get online.

Huntsville's digital divide does not only reflect the reality that some adults may lack the confidence to adopt modern communication software and hardware - It also reveals that many students are unable to complete homework assignments because their guardians are unable to acquire and maintain a home-based internet subscription.

Income barriers in the city of Huntsville will require that taxpayer and philanthropic-supported entities like the public library, the public school system, and other community-based organizations be engaged by policymakers. These on-the-ground partners have a unique understanding of ongoing obstacles to broadband adoption and of ways to educate Huntsville residents.



For Pastor Errol Davis and his fellow clergy members, COVID-19 has been a threat to the deep bonds shared between congregation members. However, it has also served as a catalyst for local leaders to address the city's digital divide with more urgency. The pandemic exposed the shortcomings of a collective effort to remain competitive in a global information age while simultaneously revealing that when confronted with unprecedented change, Huntsville's leadership and community members are courageous enough to overcome such a challenge.

Recommendations



The City of Huntsville to facilitate free digital literacy training in collaboration with nonprofit organizations and community leaders.



Huntsville City Public Schools to partner with the Huntsville-Madison County Public Library to enroll the parents into workforce development modules.



Higher education institutions in the area to study the effects of broadband adoption and digital literacy on socioeconomic outcomes for residents.



Public and private partnerships to be formed to provide refurbished laptops, tablets, or iPads to households with a demonstrable need for a WiFi-connected device.



Huntsville City Public Schools to develop partnerships with higher education institutions to connect student volunteers with teachers and parents who need assistance in navigating virtual learning software.



The public library system to receive additional funding for a 200% increase in the number of hotspot devices available for free rentals. Resources may also be required for additional staff to track the devices and provide digital literacy support.



Standard Rates in Huntsville

Google Fiber	Hughes Net	Viasat	Wow!	Xfinity	AT&T
\$50-70/month	\$59.99	\$50/mo	\$44.99/mo	\$25/mo	\$59.99/mo
Download and upload speeds up to 1 gigabit (1000 Mbps)	↓25 Mbps & ↑3 Mbps	↓12 Mbps & ↑3 Mbps	↓100 Mbps & ↑10 Mbps	↓25Mbps	↓100 Mbps & ↑20 Mbps
No data caps	2-4 users	1-2 users	4+ Users		4+ users
1 TB of free cloud storage	Gaming, live streaming, Alexa	Basic browsing, email use	HD and 4K streaming		HD and 4K streaming
Multi-stage sample	HD streaming on multiple devices	SD video streaming on one device	Smart-home friendly		Smart-home friendly
Segment random sample					

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