Failed Connection

The broadband gap

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Cover photo:

Edna Rodríguez-Plate, who teaches Hispanic studies at Hamilton College, spent much of the spring of 2020 teaching from her car in a campus parking lot. She gets no broadband internet or cellphone service at her home, in upstate New York.

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Turtle Mountain Community College serves a small Native reservation in a remote region of North Dakota. Many area residents cannot afford internet service at home, and some students must drive long distances to find hot spots.

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TRIBAL COLLEGE JOURNAL

When the pandemic forced colleges across the country to shut down their campuses and move online more than a year ago, the situation highlighted some of the stark inequities in American society — including uneven access to broadband. It quickly became apparent that students who lacked reliable internet access would be at a serious disadvantage. Online classes have been challenging enough for students with good internet connections. But for many low-income and rural students, the broadband gap has made success untenable.

The term "broadband" generally refers to high-speed internet access that can be delivered through technologies like optical fiber or cable lines. Some 42 million Americans lack the ability to purchase either wired or fixed-wireless broadband internet, according to the research group Broadband Now. Many of them live in heavily minority urban neighborhoods, rural communities, or tribal lands. For students and faculty members living in remote regions, the cost of expanding broadband wires to their homes can

be astronomical, and a lack of cellular service renders wireless internet hot spots useless. Low-income students living in areas long-neglected by telecommunication companies have few affordable high-speed internet options, and often have to share limited bandwidth with other family members.

There have always been students whose circumstances landed them on the wrong side of the country's digital divide. Among them are adult learners who have no access to broadband at home to complete their coursework. But that gap was not as clear before the pandemic, because such students could gain internet access through campus Wi-Fi, computer labs, libraries, coffee shops, or public locations, says Jarret Cummings, senior adviser for policy and government relations at Educause, an advocacy group for technology in higher education.

Since the outbreak of the pandemic, colleges have scrambled to provide mobile Wi-Fi hot spots and computers to needy students. And students have scrambled to parking lots on campus or at fast-food places where they can use Wi-Fi on their smartphones to take exams, log onto lectures through Zoom, and turn in their coursework. But Barbara K. Mistick, president of the National Association of Independent Colleges and Universities, compares colleges' efforts to "putting a Band-Aid on a wound that needs 37 stitches."

Community colleges have been hit the worst by the coronavirus, with enrollment down 9.5 percent as of early 2021 from the previous spring, according to the National Student Clearinghouse Research Center. (Overall undergraduate enrollment was down 4.5 percent.) A lack of broadband access very likely contributed to the drop, according to reports and surveys by the think tanks New America and Third Way.

Congress recently provided some federal money in coronavirus-relief legislation to address the issue, and some states have taken steps of their own. A number of communities have taken it upon themselves to start their own publicly owned broadband networks, which have helped students and colleges with fast, affordable internet service. But many states have banned cities and counties from running their own broadband networks. Experts and advocacy groups agree that much more federal funding is needed to keep communities and students from falling further behind.

This report examines the challenges associated with uneven access to broadband. It looks at some of the efforts underway to help narrow the gap between wealthy and low-income students, and between urban and rural ones. And it discusses what kinds of actions — by governments, educators, and business sectors — are needed to get remote higher education on a strong, consistent wavelength.

How the Pandemic Has Widened the Digital Divide

The lack of broadband in rural areas has challenged colleges and communities for years, but the gap has grown far wider since the outbreak of the pandemic. As a result, rural and low-income communities are often left behind, and public policies that aim to solve the issue are unable to provide enough incentive for companies to invest in those regions.

Frontier Nursing University stands as an example of how crucial broadband services are to rural colleges. The 82-year-old institution, which primarily offers graduate degrees in nursing and midwifery via distance education, recently decided to uproot from its historic campus in southeastern Kentucky and move two and a half hours north. It cited the need for better broadband access as a major factor.

Frontier had long been central to the identity of Hyden, Ky., a tiny town of around 440 residents. The 2,500 students enrolled at Frontier each semester typically hail from all over the country, says Susan Stone, Frontier's president. Students do not live on or near campus and have relied on online courses — supplemented by on-campus visits — since 1990. They visit the campus twice throughout their studies — during a five-day orientation, and again prior to starting their clinical sessions for in-person simulations and exams. Each year, more than 1,500 students would stay at the

COURTESY OF FRONTIER NURSING U.

Frontier Nursing U. recently moved its campus to Versailles, Ky., so it could expand and meet the growing demand for rural health care. The need for better broadband access was a major factor in the college's decision to move.

university's campus, often visiting Hyden's shops and restaurants and boosting its economy, said Stone. The university also employed about 30 local residents.

Frontier tried to make it work in Hyden, but the situation eventually became impractical, says Stone. Internet on the campus would frequently go down, especially during storms, forcing all online classes and simulations to stop. Cell service was almost nonexistent on campus. Occasionally a student from out of town could get enough of a signal to dial home from specific spots on campus. Frontier spent heavily to improve its internet connection, and even asked the area's single broadband provider if it could build a cellphone tower on campus, but that request was denied, Stone says.

When telecommunication companies decide whether to extend broadband services into a region, they weigh whether they can recover their costs and make a profit from

providing those services, Jarret Cummings, senior adviser at Educause, said in an email. An area's population density and average income factor into that decision, since they are key indicators of the number and profitability of potential customers.

Colleges need access to broadband for a range of tasks, including billing, connecting students to student accounts and teaching platforms, applying for federal funds, encouraging innovation, and recruiting faculty members, to name a few.

During the pandemic, technologically and financially disadvantaged colleges — including many minority-serving institutions — have struggled to purchase the new internet infrastructure, software, and training needed to pivot to online learning as quickly as their wealthier peers, says Antonio R. Flores, president of the Hispanic Association of Colleges and Universities. Many underserved colleges were unable

Logging On Not an Option

This map shows the locations of 20 large and medium-size cities that had the highest share of households lacking broadband internet subscriptions, including via cellphone, in 2019.
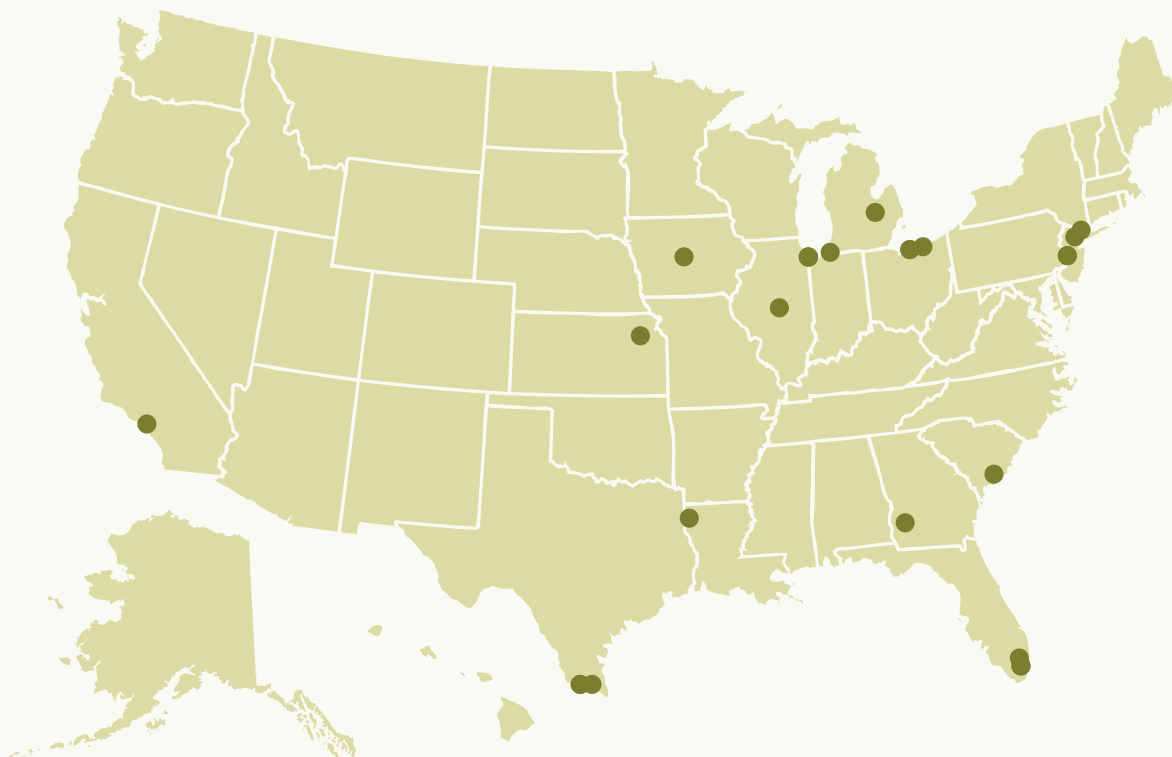

Chart: Audrey Williams June

Source: National Digital Inclusion Alliance analysis of U.S. Census data, "Worst Connected Cities 2019"

to equip their classrooms with newer, smart-classroom technologies like cameras and microphones.

A survey by New America and Third Way in the summer of 2020 found 57 percent of college students said that having access to a stable, high-speed internet connection could be challenging if they continued their education online. Students without reliable internet access — including those in urban areas — have struggled to complete coursework, watch or participate in online lectures, and take tests. Some may drop out,

hurting their chances of earning a degree, said Emily Bouck West, deputy executive director of the bipartisan policy group Higher Learning Advocates, in an email.

For historically Black colleges and universities, having reliable broadband improves their ability to expand curricula and help leaders to make a stronger case about their programs and institutional identities during virtual site visits with accreditors. It allows students to get books that may only be available online and helps prepare them to lead the work force of the future, says Lodriguez

Students without reliable internet access have struggled to complete coursework, watch or participate in online lectures, and take tests.

Murray, senior vice president for public policy and government affairs with UNCF.

More than 70 percent of all HBCU students are Pell-eligible, and many are also first-generation students facing family pressure to succeed at college.

High-speed internet service may not be a priority for many low-income families, who may instead spend money on basic living expenses such as rent and utilities. Even when families purchase lower-cost basic internet packages, the connection often isn't strong enough to stream classes or lectures on Zoom, says Barbara K. Mistick, president of the National Association of Independent Colleges and Universities.

During the pandemic, a lack of broadband has become another of many stressors that have made a college education challenging for disadvantaged students. Those who attend minority-serving institutions, for instance, often return to overcrowded homes, leaving them without a place to study, says Flores. Latino and Black families also have suffered from higher Covid infection rates, more hospitalizations, and more deaths. And their family members often work essential jobs in which they are highly exposed to the virus, says Flores.

HOT SPOTS HELP, BUT NOT ENOUGH

Turtle Mountain Community College serves the Turtle Mountain Band of Chippewa Indian Reservation in a remote region of North Dakota near the Canadian border. In 2017, over 41 percent of the tribe lived in poverty and 63 percent were unemployed, according to statistics included in a federal grant application submitted by a tribe official. Many residents cannot afford to pay for internet services.

The tribe's internet-service provider has made major strides in recent years to improve internet capacity, says Chad Davis, the college's information-technology director. Still, a survey conducted in the spring of 2020 found that more than 5 percent of students did not have internet access at home. During the pandemic, wireless hot spots were placed at the college and other locations throughout the reservation so students could sit in their cars to get internet access, said Davis. But driving on often unpaved roads during grueling North Dakota winters can be dangerous, and not everyone can find a ride to the nearest hot spot. Many students have also had to care for children at home during the pandemic.

Without internet access, community members can't scroll online to find a job or do extra research that might help them in class. "There are a lot of different hurdles that come into play when students are unable to have that sufficient internet access," says Davis.

Meanwhile, Frontier, the nursing university, will officially welcome students to its new campus in Versailles, Ky., in the fall of 2021. Stone says many staff members from Hyden left behind their heritage and made the move to the new campus, in a suburb of Lexington.

"We were promised for years that it was going to get better," the college's president says of the long struggle for internet services. "You can be down for three days, and you can't run a college like that in this day and age."

How the Gap Jeopardizes Student Success

For students who live in remote areas of the country, connecting to the internet can involve major hurdles.

Kayla Kenny, a freshman at Coconino Community College, in Flagstaff, Ariz., has struggled to take courses online from her home on the Navajo Nation reservation. Coconino serves some 6,000 students who live in a sprawling region in northern Arizona that encompasses the Grand Canyon. Kenny lives an hour from campus and 30 minutes from a public library and high school where she can access public Wi-Fi from her car. But service is poor on days when it's cloudy or windy, or when too many people are using it at the same time, and she often loses her connection.

Rural colleges like Coconino often provide wireless hot spots to connect students to the internet or expand Wi-Fi to campus parking lots. But hot spots do not work in cellular dead zones, and driving long distances to campus isn't an option for many students, especially those without cars.

Connecting her home to poor-performing internet would cost Kenny's family of four $100 a month, she says — a price that is too high. She has a wireless hot spot on her computer, but a mountain blocks her home from connecting to the nearest cell tower. She can get a bit of service from her family's horse barn or on top of a nearby hill, but it's tough working outside, where

Edna Rodríguez-Plate, who teaches Hispanic studies at Hamilton College, taught from her car in a campus parking lot in the spring of 2020.

the winds are strong and the horses are noisy.

In class, Kenny often gets booted off Zoom. When she loses connection while drafting coursework for her calculus class, her uncompleted assignment automatically gets submitted, resulting in lower grades. She then has to wait 30 minutes to reconnect. Biology assignments are especially difficult, because they can require home kits to complete. Kenny needs to drive to a parking lot so she can follow along with a demonstration streamed on YouTube. But some steps require refrigerating materials such as yeast or gelatin for an hour or microwaving them before moving on to the next step.

So far Kenny's professors have been flexible and tried to make arrangements to allow her to complete her work, but, she says, "It is kind of frustrating that my grades have been affected … I learned to kind of accept that I have to put in more effort than most people would in order to get grades I am completely happy with."

Kenny's story is shared by many students living in rural parts of the country. Such regions have suffered from a dwindling population and disinvestment due to the outsourcing of manufacturing and agricultural jobs that once anchored their economy, says Chet Jordan, a board member for the Rural Community College Alliance. As people continue to move out, basic services like broadband are

57%

The share of college students who said having access to a stable, high-speed internet connection could be challenging if they were to continue their education online.

Source: New America and Third Way survey, 2020

not being provided at the same rate as in other parts of the country, he says.

Students at Southeast Kentucky Community and Technical College encountered problems when trying to stream classes through Zoom after classrooms moved online in March 2020. The two-year college serves a rural, mountainous region consisting of four counties bordering Tennessee and Virginia. Unless you live along a main trunkline, internet connection is often slow and expensive, says Roy Silver, a sociology professor at the college.

One student has a wireless hot spot on her computer, but a mountain blocks her home from connecting to the nearest cell tower.

Canon Moore, a second-year sociology student, pays $100 per month for the fastest internet in the area, yet he frequently loses service, he said in an email. For a struggling coal-mining region where 30 percent of residents live in poverty, that is an expense many cannot afford.

Moore, a social worker, lives in Wallins Creek, Ky., a tiny unincorporated community near campus. He has run into issues logging in to classes on Zoom countless times during the pandemic, he said in an email. But he is better off than many classmates, since he has a powerful computer that allows him to fully participate in class. And his professors have been understanding when

he turns in an assignment late because his internet dropped the day it was due.

Broadband providers have also often failed to invest in lower-income urban neighborhoods, due to a practice known as "digital redlining," says Josh Stager, deputy director of New America's Open Technology Institute. A survey conducted by Higher Learning Advocates in 2020 found that Latino and Black students were more likely to rely solely on mobile data to gain access to course material, and had more difficulty getting content.

The limitations have forced students and faculty members to be resourceful.

WHEN YOUR OFFICE IS YOUR CAR

Edna Rodríguez-Plate, an associate professor of Hispanic studies at Hamilton College, taught two courses from the back seat of her car after the institution switched to remote learning in March 2020. For eight weeks, she taught from a campus parking lot where the four-year college had extended free Wi-Fi. She placed a laptop on a step stool in the back seat of the car and wrapped herself up in a blanket to keep warm.

She lives on a large, remote plot of land about a quarter mile outside of Hamilton's rural campus in Clinton, N.Y., about an hour east of Syracuse. Internet service is very limited there, and she was told by a telecommunications company that it would cost $10,000 to extend internet wires to her home. She resumed classroom teaching in the fall of 2020, when state restrictions loosened. But Covid has accelerated
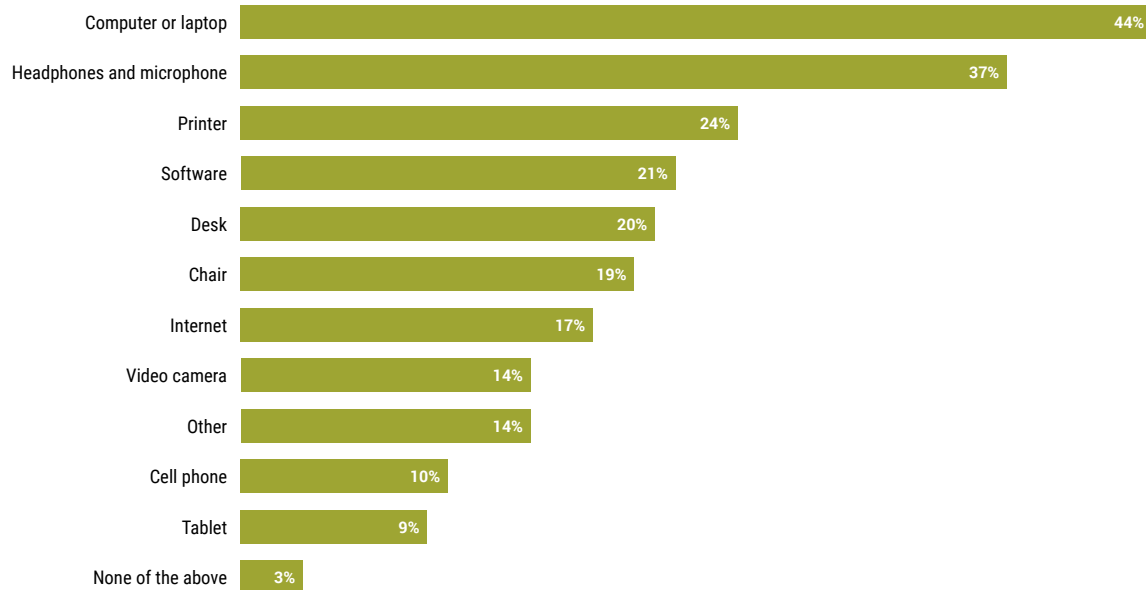
97%

The share of college students who said having access to a stable, high-speed internet connection was important for them to succeed academically.

Source: New America and Third Way survey, 2020

Big-Ticket Shopping List

Since March 2020, 41 percent of college students have had to buy items to support their online education. The largest share of those students purchased a computer or laptop.

Item	Percentage
Computer or laptop	44%
Headphones and microphone	37%
Printer	24%
Software	21%
Desk	20%
Chair	19%
Internet	17%
Video camera	14%
Other	14%
Cell phone	10%
Tablet	9%
None of the above	3%

Note: Respondents were surveyed in August 2020 and could choose more than one answer.

Chart: Audrey Williams June

Source: New America and Third Way

society's dependence on the internet, and without broadband, she is not confident that her family will be able to remain at their home.

"You make lemonade out of lemons," she says, but adds: "It was frustrating."

Patrick Cate, vice president for academic and student affairs at Lakes Region Community College, in central New Hampshire, worries that students who left college during the pandemic will struggle when they return — assuming they do.

The college started offering hybrid courses that included a mix of in-person and online learning when the pandemic broke out. But an estimated 10 percent of students have encountered problems with internet access over the past year, says Cate.

"When they come back, the institutions that they went to may look very different," he says. "I do wonder, the students who took some time off, what are we going to do to make sure we are able to help them get ready for those changes?"

Strategies for Closing the Broadband Gap

Helping students succeed during the transition online has been especially challenging for faculty and staff members of rural community colleges. Many of them are simply unable to make the enormous commitment of time, effort, resources, and flexibility needed, says Chet Jordan, of the Rural Community College Alliance.

Rural colleges need to take it upon themselves to start advocating at the state and national level for universal Wi-Fi for all Americans, he says. If the divide goes unaddressed, such colleges will lose their ability to reach all students and continue to suffer — or even close, he says. That means rural communities across the country could lose their civic centers, cultural institutions, meeting places, town centers, and other places that bind residents together.

"Internet access at this point in our own history is an essential resource, and to deprive people of it, or to overcharge people who can't afford it, is damaging the core of the community and our ability to remain in a rural environment," he says.

The nation's broadband gap affects rural and low-income residents in many ways. For example, in the summer of 2020, as the pandemic caused mass layoffs throughout the country, state websites were overwhelmed with requests for unemployment benefits, hurting people's chances of getting crucial financial relief.

In early 2021, white senior residents of Washington, D.C., were able to secure appointments for the coronavirus vaccine at higher rates than Black seniors because they often had better access to computers, good internet service, flexible working hours, and family and friends who could help them navigate the first-come, first-serve online or phone system, *The Washington Post*

A student at Barton College, in Wilson, N.C., uses free Wi-Fi provided by a city-owned broadband network called Greenlight. Barton says its partnership with the city has allowed it to install a campuswide fiber-optic network that connects student housing, classrooms, and facilities with fast and reliable internet service.

reported. (The city responded by reserving a portion of vaccine appointments for residents of underserved neighborhoods.) Similar issues have arisen in other states that relied heavily on online tools to book vaccine appointments.

In rural areas, improved broadband infrastructure would allow telehealth to help communities solve problems caused by closures of rural hospitals and medical practices, a shortage of health-care workers, and the lack of public transportation.

While existing federal programs do not adequately address the needs of communities where broadband is limited, members of Congress appear willing to help. In total, an estimated $80 billion to $100 billion would be needed to close the digital divide,

says Josh Stager, of New America's Open Technology Institute. That amount was reflected in proposed $94-billion legislation reintroduced in early 2021 by Democratic members of the new Congress. The legislation would make high-speed broadband affordable and bring it to areas where service is slow or unavailable.

> "Internet access at this point in our own history is an essential resource, and to deprive people of it, or to overcharge people who can't afford it, is damaging the core of the community."

FEDERAL SUPPORT GROWING

The Biden administration also appears willing to spend heavily on infrastructure improvements, including expanded broadband, in the near future. Between March 2020 and March 2021, Congress included significant amounts of money in coronavirus-relief packages aimed at helping more people, including college students, go online.

The Cares Act, passed in March 2020, provided $14 billion in relief to help colleges respond to the pandemic and to provide emergency grants to students. Colleges were allowed to use their relief to take steps to aid their transition to online learning, by providing Wi-Fi hot spots, for example. However, they had broad discretion on how to use the funds and cited many competing needs.

The $1.9 trillion federal relief package passed in March 2021 provides $7.1 billion to help K-12 schools and libraries purchase broadband and equipment like Wi-Fi hot spots and routers, which they could use to extend access to the homes of students and community members. While none of the money is specifically targeted for higher education, it could indirectly help some rural students. For instance, a student could potentially access a hot spot from a local library that received funding, or get better broadband at home if they have a sibling in K-12, Educause's Jarret Cummings said in an email.

The coronavirus-relief bill passed in December 2020, meanwhile, provided the most targeted broadband support for college students. That package set aside $3.2 billion for service providers to offer subsidized broadband discounts of up to $50 per month to certain populations. The amount is higher (up to $75 per month) for those living on tribal land. Under the legislation, college students who are Pell Grant recipients are eligible for discounted services, as are lower-income households, families with children eligible for free or reduced-priced lunch, and people who have been recently laid off or furloughed.

An additional $285 million was set aside to help HBCUs, other minority-serving institutions, and tribal colleges provide connectivity to students with financial needs and to improve campus technology. The funds also allow HBCUs and other minority-serving institutions to form partnerships with minority-led businesses and nonprofits that make broadband service and equipment available in their communities.

But experts warned that the money in the December 2020 relief package could run out within months. Congress should provide additional and permanent funding for those programs, and examine whether to distribute funds directly to colleges to assist

> "Community-owned networks offer some of the fastest and most affordable internet service in the United States, so we'd love to see more of them in every state."

students, Emily Bouck West, from the policy group Higher Learning Advocates, said in an email.

"Advances that have been made in a few of these Covid-related bills are significant, impactful and good," says Lodriguez Murray, the UNCF senior vice president. "But they are not enough to close the digital divide that we see on our campuses and amongst our folks."

It will take more than money to fully address the digital divide, say Stager and others. The federal government needs to exercise strong oversight over telecommunication companies to ensure they are actually using the federal money they receive to extend broadband services to people who need it, says Stager. However, such oversight may require new legislation. In 2017, the Federal Communications Commission rolled back rules that essentially unraveled much of the oversight that existed before, Stager says.

In regions where companies have opted not to invest, local governments in many states can take it upon themselves to con-

nect their communities to high-speed internet service by building their own networks. But because of lobbying efforts from some providers, at least 20 states either ban or restrict such municipal networks, Stager said in an email. "Community-owned networks offer some of the fastest and most affordable internet service in the United States, so we'd love to see more of them in every state," he said.

A COMMUNITY STEPS UP

For some colleges, the community approach can be a game changer. Students at Barton College, a private liberal-arts college in the small city of Wilson, N.C., receive affordable, high-speed internet service from the city.

Wilson purchased fiber-optic networks from a local cable provider in the early 2000s and has offered low-cost, high-gigabit internet speeds to residents for nearly a decade, through a broadband network called Greenlight. The service has over 10,000 customers, and residents can get free internet access through wireless hot spots located throughout the city. Barton's 2018 partnership with the city allowed the college to install a campuswide fiber-optic network that connects student housing, classrooms, and facilities with fast and reliable internet access, said the college's president, Douglas N. Searcy, in an email.

Barton continued face-to-face instruction during the pandemic, but with more students working at home, Greenlight added an option that offered Wilson residents basic internet services for $10 per month, complete with enough bandwidth for off-campus students to access all remote-learning tools. It also added 30 free wireless hot spots throughout the city, Searcy said.

The hot spots gave students a convenient Wi-Fi option for remote learning. The result, according to Searcy: "Barton commuter students and residential students have been consistently connected throughout the pandemic."

The broadband gap in higher education is a real and expensive problem that experts and advocates say the federal government and, to a lesser extent, local governments can solve. Federal programs that extend broadband into underserved areas while helping low-income Americans afford it are crucial. But those programs need permanent funding, and the telecommunications companies that receive federal money need to be closely regulated and monitored to ensure they are serving the people who need affordable access.

Local governments should also be encouraged to focus on the issue, by creating municipally owned networks that offer residents low-cost, high-speed access. Supporters of such networks say Congress should pass federal legislation that would prevent states from banning or restricting municipal networks, as a number of them now do.

Unless the broadband gap is narrowed, many minority-serving institutions, along with rural, tribally controlled, and community colleges, will continue to struggle financially. Some could even be forced to relocate or close. If that happens, impoverished rural areas could lose important community hubs.

Until there is widespread support for universal broadband, many rural students will continue to drive long distances to parking lots where they can find just enough Wi-Fi to turn in an assignment or exam, or follow along with lectures being streamed online. And urban students whose families can't afford the internet at home will continue to log on at campus hotspots, coffee shops, and other locations. Some students, especially those at community colleges, have found the obstacles too cumbersome during the pandemic, and have dropped out.

The pandemic has cast a spotlight on the growing inequalities between students who have access to broadband and those who do not. Now, says Chet Jordan, the Rural Community College Alliance board member and an advocate of broadband for all, it's time to end those inequalities.

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