



**Education**  
SUPERHIGHWAY

September 2017

**2017 STATE OF THE STATES**

# **Fulfilling Our Promise to America's Students**





# Table of contents

**3** Our promise to America's students: A letter from Evan Marwell

**5** National highlights

**9** What's left to do

**10** Getting to zero by 2020

**13** Expanding fiber networks to unconnected schools

**15** Bringing Wi-Fi to every classroom

**18** E-rate modernization catalyzes progress

**22** Action plans

**22** Governors

**23** Service providers

**24** School districts

**26** Closing the connectivity gap (for good)

**29** About the data

“With the support you have dedicated to this project, we’ve made critical progress in connecting public schools across the U.S. – so much so that we’re almost there, to the finish line.”



Dear Reader,

When I started EducationSuperHighway, the urgency of the connectivity gap was undeniable. Every year, millions of high school seniors were graduating, and every year, too many lacked the digital learning opportunities they needed to thrive in their futures.

**That’s why, in 2013, our nation made an important promise to close that connectivity gap and level the playing field for children throughout the U.S.** The promise was that public school students, regardless of their location, age, or socioeconomic background, would have high-speed broadband access in their classrooms within five years.

The Federal Communications Commission's (FCC) 2014 E-rate modernization was the catalyst that gave way to a massive broadband expansion throughout America’s public education system. Across party lines and geographic boundaries, governors, state and district leaders, schools, and service providers have thoughtfully leveraged E-rate’s resources to make the promise of nationwide connectivity a tangible reality.

With the support you have dedicated to this project, we’ve made critical progress in connecting public schools across the U.S. — so much so that we’re almost there, to the finish line.

**But there are still 6.5 million students that need our help.** Without it, these students will not have equal access to the digital opportunities now afforded to nearly 40 million American kids.

As you read this report, I encourage you to:

- ▶ Accept our sincere gratitude for your continued support to this vital mission. As you’ll see, progress has been nothing short of incredible in the past several years.
- ▶ Consider the ways (detailed in “Action Plans”) that you can help definitively close the connectivity gap in America’s public schools by 2020.

Success is within reach: Let’s make that final push toward digital equality in every school, for every child.

Many thanks,

A handwritten signature in black ink, appearing to read 'Evan Marwell'.

Evan Marwell  
Founder and CEO  
EducationSuperHighway

# 6.5 MILLION

more students  
still left to connect

---



**39.2 M**  
students connected



**2.6 M**  
teachers connected



**74,000**  
schools connected

## National highlights: 6.5 million students left to go

In 2013, our nation made a promise to close the K-12 digital divide and level the playing field for children throughout America. In the past four years, unparalleled bipartisan action has led to exceptional progress toward fulfilling this promise by connecting an additional 35.2 million of our students. This progress has been possible thanks to the joint efforts of many, including:

- ▶ The Federal Communications Commission (FCC), which modernized the E-rate program.
- ▶ 46 governors, who have led the effort to upgrade their states' school broadband networks.
- ▶ State and school district leaders, who have brought high-speed connectivity to 8,379 school districts.
- ▶ Service providers, who have dramatically improved the affordability of broadband.

In 2017, the progress made possible by E-rate modernization continued, reducing the number of students without high-speed Internet access by 5.1 million and the number of schools without 21st-century broadband infrastructure by 45%, thereby setting the stage for the nation to deliver on our promise of digital equity by 2020.



### OUR NATION'S CONNECTIVITY PROMISE

In 2014, the Federal Communications Commission (FCC) [modernized the E-rate program](#). That was the first step in delivering on our nation's promise to connect America's public school students. The FCC established three connectivity goals:

1. 100 kbps per student of Internet access, the [minimum recommended bandwidth](#) to enable digital learning in the classroom.
2. Fiber connections to every school, so that school bandwidth can reliably grow over time.
3. Wi-Fi in every classroom to support one-device-per-student programs.

### **39.2 million students and 2.6 million teachers in 74,000 schools now have the Internet access they need for digital learning.**

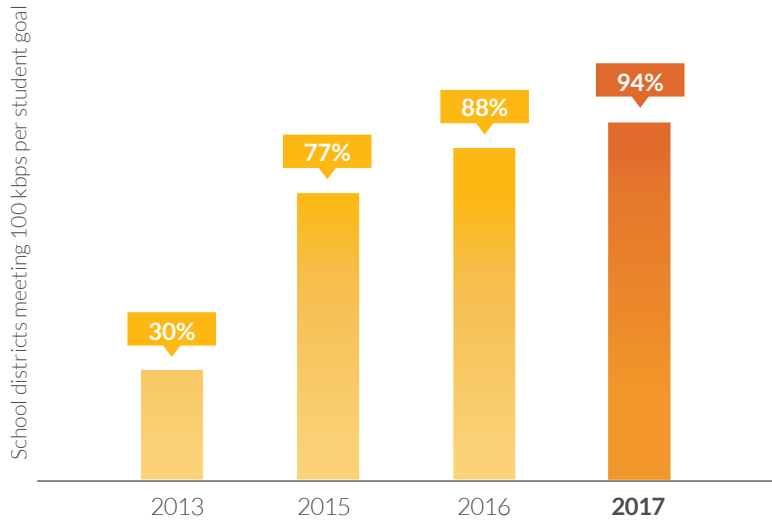
Since 2013, the bipartisan effort to connect America's students to 21st-century learning has delivered high-speed broadband to 94% of public school districts, representing an increase of 35.2 million students and 2.3 million teachers who are now meeting the FCC's minimum Internet access goal of 100 kbps per student.

To date, nine states have achieved the remarkable milestone of delivering high-speed Internet access to 100% of their students. This dramatic improvement in connectivity has leveled the playing field for students regardless of their level of affluence or location, and it is propelling forward digital learning opportunities across the country.

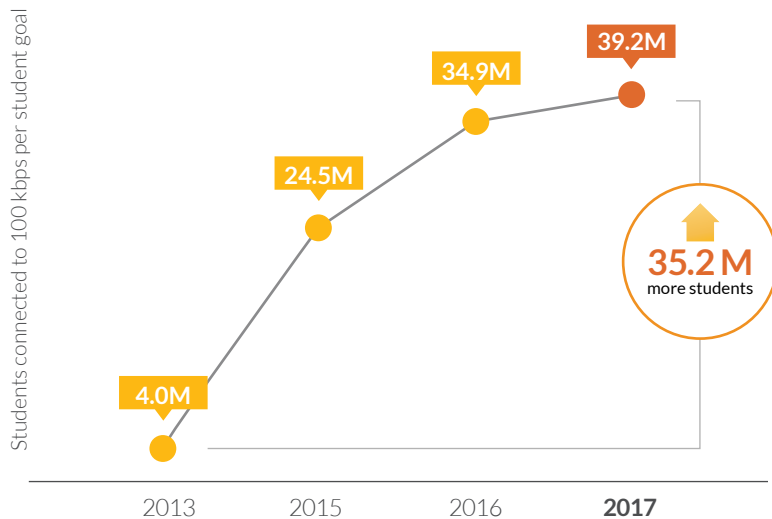


# OUR PROMISE & PROGRESS

**Chart 1: 94% of school districts are now ready for digital learning**



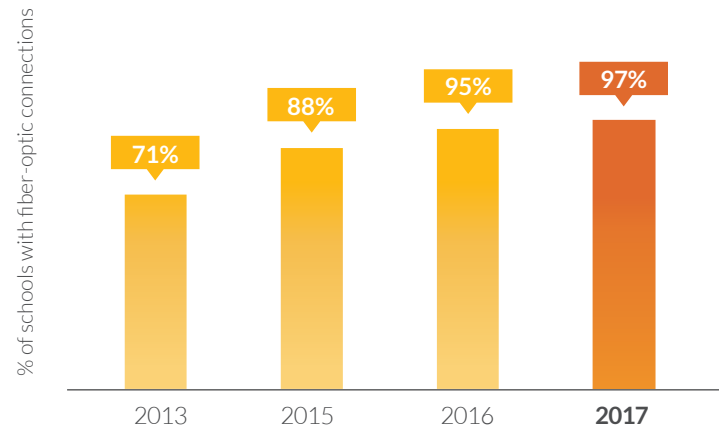
**Chart 2: An additional 35.2 million students gained access to the broadband they need for digital learning in the last four years**



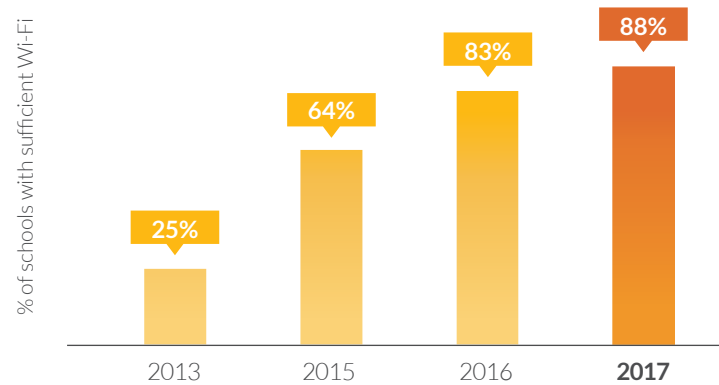
**We also dramatically improved the infrastructure needed to deliver high-speed broadband to classrooms.**

To deliver high-speed broadband to students and teachers, every school needs a fiber-optic connection and every classroom needs a Wi-Fi access point. Today, estimates show that 97% of schools are connected by fiber and 88% of schools report having sufficient Wi-Fi in their classrooms.

**Chart 3: 97% of schools have the fiber-optic connections required to meet current and future connectivity needs**



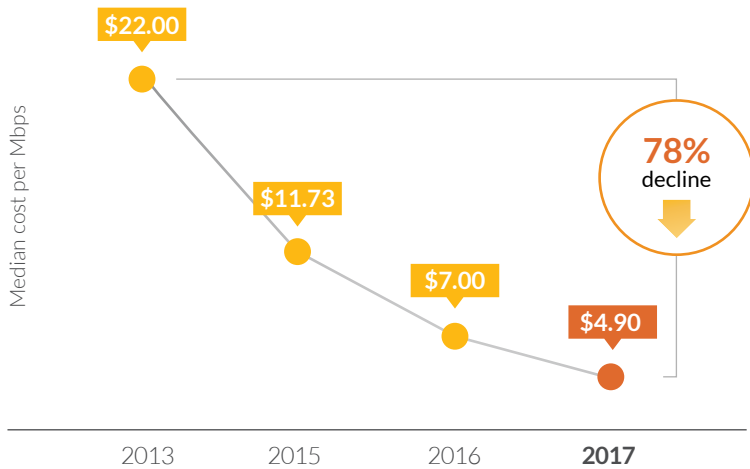
**Chart 4: 88% of schools report having sufficient Wi-Fi in their classrooms**



**Service providers have made broadband significantly more affordable.**

In 2017, Internet service providers continued to dramatically increase the affordability of broadband by taking advantage of technological improvements that allowed them to provide significantly more bandwidth to school districts at the same cost. As a result, the cost of Internet access declined 30% from 2016 to 2017.

**Chart 5: The cost of K-12 Internet access has declined 78% in the last 4 years**



A woman with dark hair tied back is shown in profile, looking down at a tablet computer she is holding. The image has a warm, orange-toned overlay. In the center, there is a white square with an orange border containing the text "WHAT'S LEFT TO DO".

**WHAT'S LEFT  
TO DO**



## What's left to do

We've made dramatic progress, but to deliver on our promise there is more work to be done.

There are still:

- ▶ **6.5 million students who don't have affordable Internet access**, limiting their ability to adequately prepare for college and careers.
- ▶ **2,049 schools that don't have fiber infrastructure**, limiting their ability to engage in current and future digital learning opportunities.
- ▶ **10,000 schools that don't have sufficient Wi-Fi**, limiting teachers' ability to deliver personalized learning for every student.



**6.5 M**

students still left  
to connect



**2,049**

schools still  
need fiber



**10,000**

schools still  
need Wi-Fi

While we must continue to expand the bandwidth available to the 39.2 million students in America's connected classrooms in order to meet growing demand from increased technology use, our immediate task is to work through the challenges the remaining students and schools without sufficient connectivity are facing.

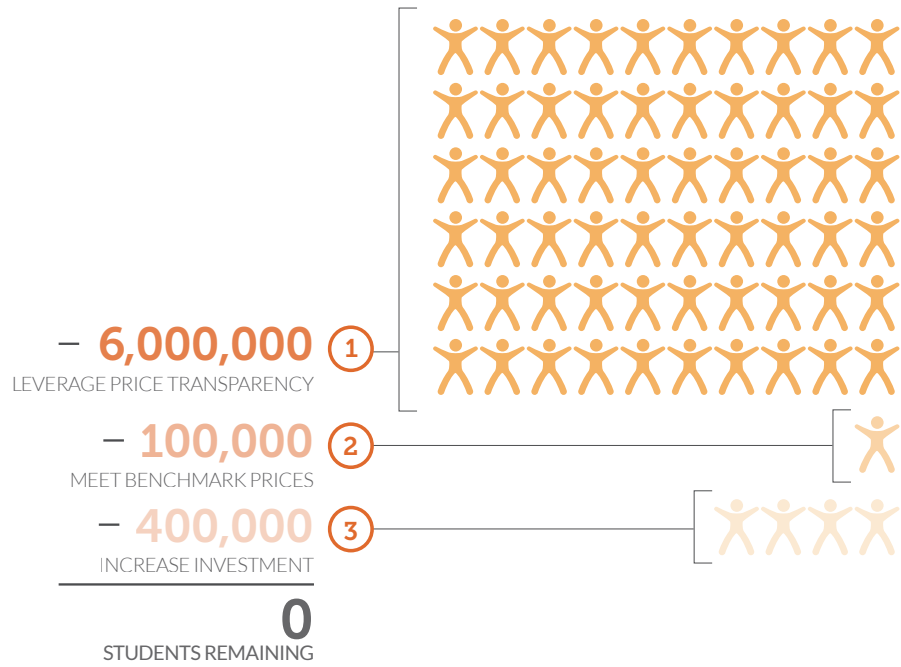
What follows in this report is an analysis and path forward for addressing each of these challenges so we can keep our promise to America's students and close the K-12 connectivity gap by 2020.

### Getting to Zero

Connecting the last 6.5 million students to the FCC's minimum recommended bandwidth for digital learning can be accomplished by:

1. Leveraging price transparency to bring affordable bandwidth to 6 million students.
2. Connecting 100,000 students to service providers that meet national benchmark prices for Internet access.
3. Empowering fewer than 40 school districts representing 400,000 students to increase their broadband investment to levels comparable to those of districts that are sufficiently connected.

## How can we get to zero by 2020?




### 1 Leveraging price transparency to bring affordable bandwidth to 6 million students

**6 MILLION STUDENTS** could be connected by ensuring their districts get the same bandwidth pricing as peer districts in their states.

A peer district is one of similar locale and district size within a state.<sup>1</sup> To analyze the potential of price transparency to connect the last 6.5 million students, we examined the current budget of each school district not meeting the minimum connectivity goal and looked to see if any of its peer districts were purchasing Internet access at prices that could meet that goal within the district’s current budget. In this report, we refer to these as “peer deals.”

<sup>1</sup>For “mega” districts with more than 50 schools, we included other mega districts nationally in the peer group. We believe this is reasonable because virtually all of these districts are located in highly competitive broadband markets often served by overlapping sets of service providers.

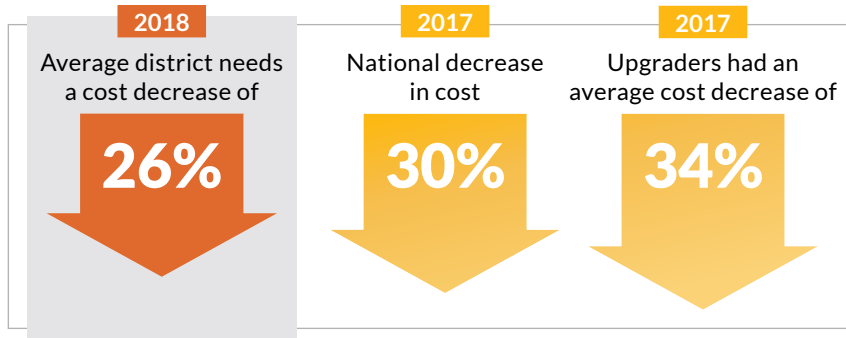


### Massachusetts District Uses Price Transparency To Power Educational Opportunity

Paul Puzzanghera, Tech Director for Andover Town & Schools, often uses price transparency tools to assess how much bandwidth his district is getting for its budget in comparison with nearby districts. He discovered that while Andover was doing well with its negotiated contract price, the district was lagging behind in its bandwidth per student. In his E-rate bid for this year, Mr. Puzzanghera made sure to request double the bandwidth to ensure that his district was receiving the most value possible to meet current and future digital learning needs.

94% of the districts (representing 6 million students) not meeting the 100 kbps per student Internet access goal could meet or exceed it within their current budget by gaining access to a peer deal. On average we found 62 peer deals for each district. 58% of districts not meeting the minimum goal had one or more peer deals available from their current service provider. That means that 2.6 million students could be connected to the bandwidth they need without their districts having to switch service providers – the quickest path to digital equity.

**58%** of districts not meeting the minimum goal had one or more peer deals available from their current provider.



In order to meet the minimum bandwidth goal by leveraging price transparency, the average district needs to lower its cost per Mbps by 26%. This is well within the realm of possibility because districts that upgraded in 2017 saw their costs decline 34% while the cost of K-12 broadband declined 30% overall. Moreover, nearly 90% of the 6 million students who can be upgraded simply by obtaining peer deals are in urban and suburban districts with access to highly competitive broadband markets, increasing the likelihood that peer deals will be available.

### DO SCHOOL DISTRICTS WITH MORE THAN 15 SCHOOLS NEED 100 KBPS PER STUDENT?

The rollout of digital learning in more classrooms has caused bandwidth demand to skyrocket. Large districts have responded to this trend by significantly increasing the amount of Internet access they purchase:

- ▶ **85% of the 900 largest school districts are buying more than 100 kbps per student.**
- ▶ **10% are already meeting the 1 Mbps per student goal.**

However, 5 million students in 15% of the largest districts, which are mostly urban and suburban, still do not have 100 kbps per student of Internet access, likely leaving them without the same digital learning opportunities as their peers in similar-size districts.

Fortunately, by making it a priority to ensure these districts take advantage of peer deals to increase their bandwidth at no cost, we can keep our promise of digital equity for all of America's K-12 students.

### 2 Connecting school districts to service providers that meet national benchmark prices

**100,000 STUDENTS** in school districts that cannot meet the minimum connectivity goal through peer pricing could be connected to sufficient bandwidth if their districts bought Internet services at national benchmark prices. In 2017, we saw continued progress in this regard, with 60% of districts nationwide now meeting affordability targets for Internet access.

To reach benchmark prices, these districts would have to lower their cost per Mbps by 12%, significantly less than the average decrease in cost per Mbps achieved by districts that upgraded in 2017.<sup>2</sup>

### 3 Increasing school district investment to levels comparable to peers'

**400,000 STUDENTS** in school districts that cannot meet the minimum connectivity goal through peer pricing or benchmark pricing could be connected to sufficient bandwidth if their districts increased their broadband budgets.

In 2016, approximately 5% of school districts could have provided their students with sufficient Internet access by investing more in broadband. A year later, fewer than 1% of districts (representing 400,000 students) need to increase their broadband budgets to bring equal digital access to their students.

**These districts spend 90% less per student on Internet access** than the average district that does meet the minimum connectivity goal spends per student. This is despite having slightly fewer financial constraints than their well-connected peers.<sup>3</sup> To meet the minimum connectivity goal these districts need to invest an average of an additional \$1.07 per student per year.

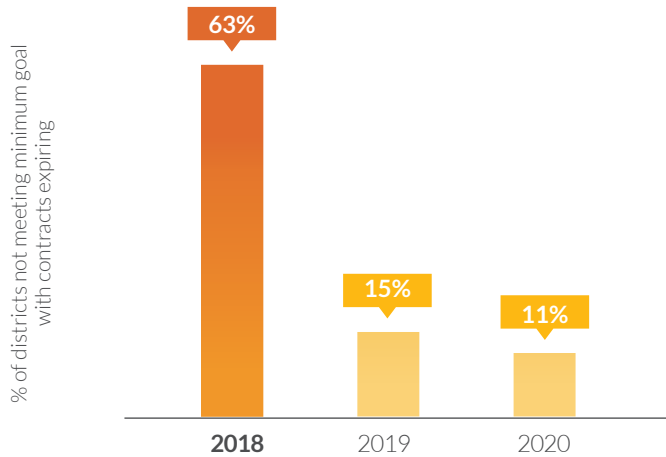
<sup>2</sup> See the "Methodology" section for additional details on pricing benchmarks.

<sup>3</sup> Districts not meeting goals that need to spend more have a median Free & Reduced lunch (FRL) percentage of 70% as opposed to those meeting goals with a median of 80%.

## Making it happen by 2020

Nearly 90% of the districts that need upgrades have contracts expiring before the start of the 2020 school year; most others have upgrade options built into their current contracts.

**Chart 6: Two-thirds of school districts not meeting the minimum connectivity goal can be upgraded by 2018**



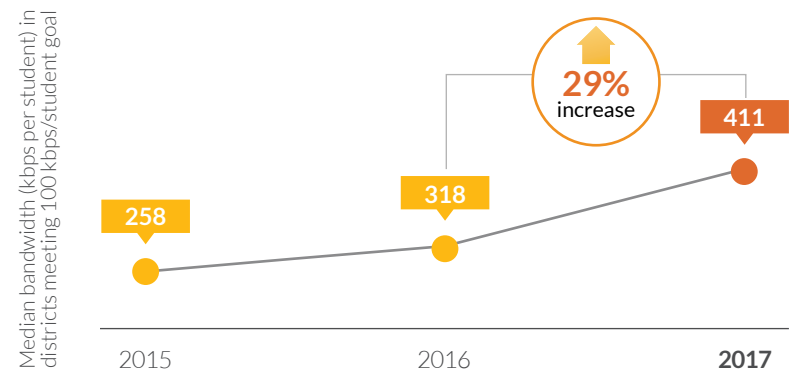
To ensure these upgrades happen, both the Universal Service Administrative Company (USAC)<sup>4</sup> and EducationSuperHighway have tools to help state and district leaders leverage price transparency to get more bandwidth for their existing budgets. [USAC's new open data platform](#) gives districts easier access to their peers' E-rate application data. Similarly, EducationSuperHighway's [Compare & Connect K-12 tool](#) provides an interface to E-rate data that helps districts identify peer pricing opportunities. These tools empower districts to negotiate more effectively with their existing or new service providers.

<sup>4</sup> USAC is an independent, not-for-profit corporation created by the FCC to administer the universal service programs, including the Schools and Libraries Program ("E-rate").

## ONCE STUDENTS HAVE THE MINIMUM CONNECTIVITY THEY NEED, WHAT'S NEXT?

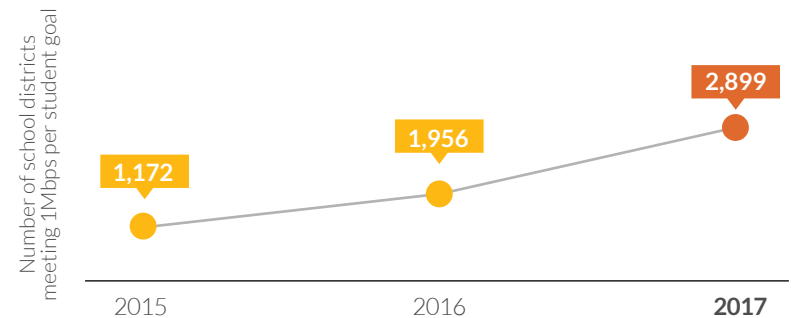
While 100 kbps per student is the minimum connectivity required for digital learning, it's important that school districts continue growing their bandwidth to keep up with the increasing adoption of technology in classrooms. As seen in Chart 7, the median bandwidth per student in districts meeting the minimum connectivity goal has increased by nearly 30% year over year.


**Chart 7: School districts are growing their bandwidth by 29%**



The growing demand for bandwidth, caused by increasing adoption of media-rich digital learning, also explains the steady increase in the number of school districts meeting the FCC's long-term goal of 1 Mbps per student. As seen in Chart 8, almost 2,900 districts (22%) are now meeting the 1 Mbps per student goal, a nearly 50% increase from 2016.

**Chart 8: 22% of school districts now meet the FCC's 1 Mbps per student long-term goal**





**When Lack of Affordable Options Becomes an Obstacle to Digital Learning**

Near the entrance to Glacier National Park in Montana, the lone school in West Glacier has long struggled with inadequate and unreliable connectivity. With only a 7 Mbps DSL connection shared among 65 students and the surrounding community, the students struggle each year to complete online assessments. Still, West Glacier's school leaders have remained determined to improve their broadband. The rural elementary school requested any and all possible upgrade options through E-rate. At the end of the bid period, the school received just one response from the incumbent provider for a small bandwidth upgrade at 11 times higher than the current monthly cost – an option that just wouldn't fit into the school's limited technology budget. In spite of its funding challenges, West Glacier will continue searching for an affordable upgrade, with the hope that a competitive provider will step forward with a solution.

## Expanding Fiber Networks to Unconnected Schools

### Why fiber is so vital

As much as we all strive to anticipate learning needs down the line, it is not always possible to predict the extent of technology's evolution. Ten years ago, few had foreseen the current prevalence of multimedia in the classroom, the number of devices on school networks, and other digital learning demands that require more robust bandwidth than the vast majority of district networks were originally built for.

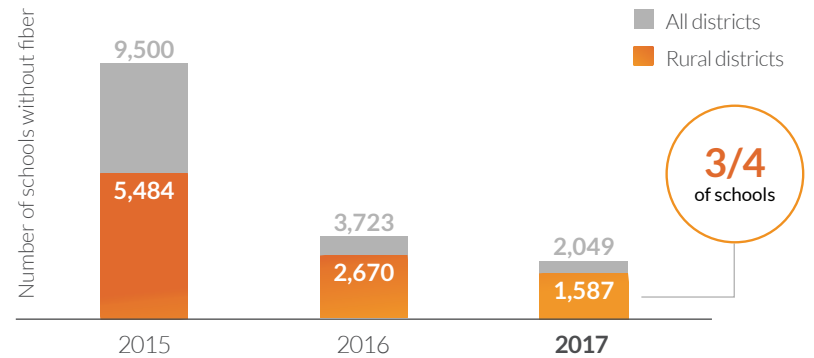
To handle today's digital learning demands and the need for additional bandwidth in the future, fiber is currently the only technology that can meet the requirements of the vast majority of schools.

### 2,049 schools still don't have this critical technology.

In 2017, states, school districts, and service providers reduced the number of schools without fiber by 45%. This was made possible through a combination of:

- ▶ Service provider network expansions
- ▶ The availability of state matching funds
- ▶ The use of E-rate special construction subsidies in districts with low budgets

**Chart 9: Rural and small town schools represent 3/4 of the schools without fiber**



Much of this progress can be attributed to E-rate modernization. The FCC significantly accelerated the expansion of fiber networks by:

- ▶ Articulating the need for scalable infrastructure to schools
- ▶ Making it easier to use E-rate funds for fiber construction
- ▶ Giving schools access to the same competitive fiber options available to businesses
- ▶ Creating incentives for states to pay part of fiber construction costs
- ▶ Increasing overall broadband funding

Unfortunately, there are still 2,049 schools without the broadband infrastructure they need to meet their current and future connectivity requirements. Schools without fiber are spread across 45 states with more than three-quarters (77%) located in rural and small-town communities.

**Chart 10: Nearly every state has schools that need fiber**





## WHAT'S LEFT TO DO

Connecting the last 3% of schools to fiber will be particularly challenging; the majority of these schools are in areas that have not historically been economically viable for service providers. However, by approaching this challenge strategically we have the opportunity to bring digital equity to the students in these schools as well as high-speed broadband to more than 2 million people in underserved communities.

### THERE ARE THREE STEPS TO ENSURING SCHOOLS HAVE THE 21ST-CENTURY INFRASTRUCTURE THEY NEED FOR DIGITAL LEARNING

- I. Empower school districts to request fiber for the schools that lack it.
- II. Work with the service provider community to ensure schools get bids.
- III. Leverage state and federal funding so schools can afford fiber.

### What is stopping the last 2,049 schools from getting fiber?

#### I. School districts aren't asking for fiber infrastructure.

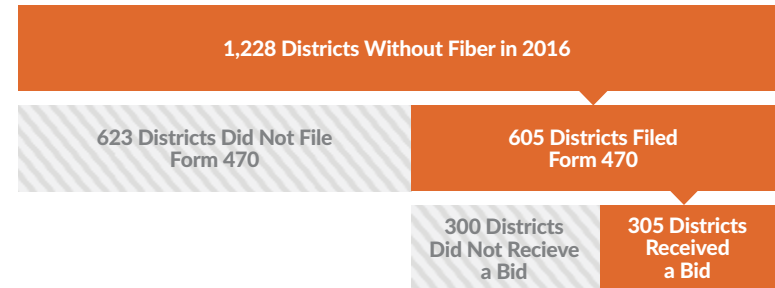
The first step in connecting schools to fiber is to make sure that the district issues a Request for Proposal (RFP), or E-rate Form 470, requesting a fiber connection to the school.

Unfortunately, in the 2016-17 E-rate cycle only 49% of the districts needing fiber connections made such a request. This may have been because they were unaware of the new options and funding available through E-rate, they didn't think there was a service provider that would offer them fiber, or they didn't have the necessary support to run a fiber procurement process.

#### II. Those school districts that request fiber are not receiving bids from service providers.

Among the 49% of districts that did issue an RFP or E-rate Form 470 requesting fiber for their unconnected schools, a third did not receive any bids from service providers. This number rises to nearly half if bids requiring E-rate special construction funding are excluded, and demonstrates the importance of the FCC's special construction changes during E-rate modernization.

**The net result is that only 25% of districts that needed fiber were able to get a bid from a service provider with a nearby fiber network.** To address this challenge, state leaders are engaging both districts and service providers to help districts prepare RFPs and ensure that service providers bid on those requests.



#### III. Many school districts struggle to come up with the budget for fiber construction.

77% of the schools requiring fiber are located in rural and small-town communities. This increases the cost for districts to bring fiber to their schools, since construction must cover significantly longer distances. In addition, rural and small-town districts often have few resources available to pay for fiber construction because of their relatively small overall budgets.

The FCC took an important first step to address the fiber cost challenges faced by rural and small-town districts during E-rate modernization. To minimize the upfront costs faced by districts to build fiber, the Commission made it significantly easier to use E-rate funds for fiber construction and created incentives for states to contribute 10% of the construction costs. In response, 18 governors and state legislatures created state matching funds with nearly \$200 million of resources available to help defray costs.

**Chart 11: 18 states have made available \$200 million in fiber matching funds**



## WHAT'S LEFT TO DO

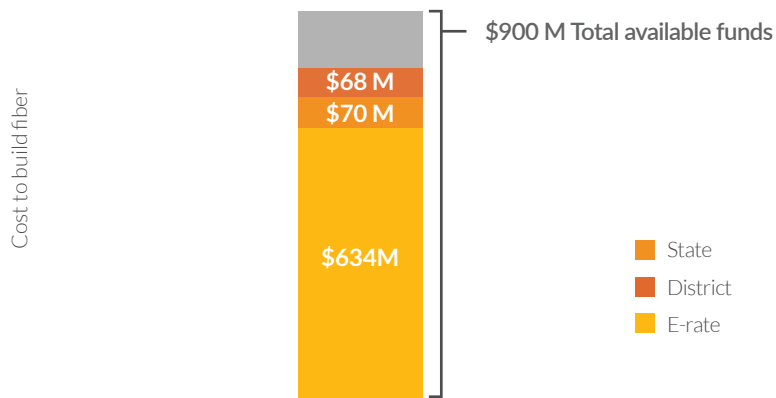
As a result, approximately 25% of the schools that need fiber can be connected at no cost to the district.

Unfortunately, this still leaves more than 1,500 schools without fiber that are unlikely to be able to afford their share of the construction costs.

Approximately 30% of these schools could be connected at no cost to the district if their state established a fiber matching fund. For the remaining schools, we estimate that their districts face more than \$68 million in out-of-pocket costs to bring fiber to their schools — approximately \$104,000 per school.

In order to ensure that no school is left without scalable broadband infrastructure, states and the FCC could provide additional subsidies for these districts so no school is required to pay prohibitive one-time construction costs. The good news is that plenty of funds exist within both E-rate and the existing state matching funds to make up this difference. Indeed, the entire cost of building fiber to the 2,049 schools that need it is less than the \$900 million of E-rate funds that remain available in 2017.

**Chart 12: Existing E-rate funding is sufficient to build fiber to all schools at no cost to districts**



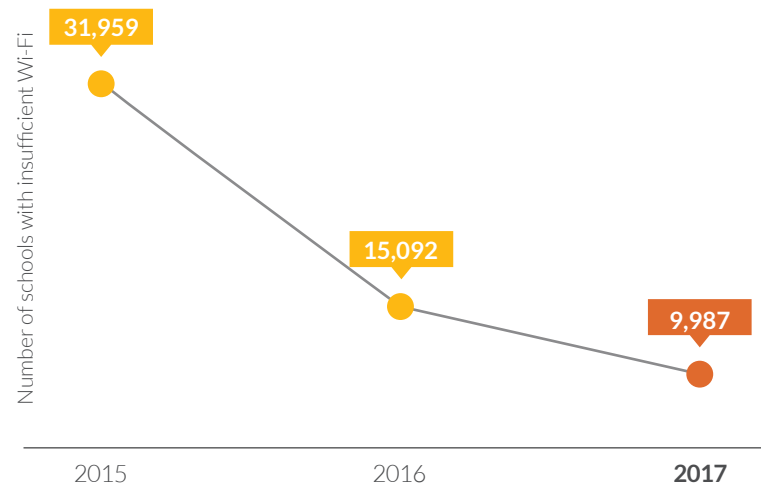
### Upgrading From Cable to Fiber Amplifies Access to Digital Learning

Ashland School District's cable modem connection made it nearly "impossible for the staff to stream video or push through any large files," said Lester Brent, the district's Technology Director. Brent sought a scalable fiber upgrade to meet current bandwidth needs and plan for the future. After bidding through E-rate, the New Hampshire district found a fiber solution that brought them 500 Mbps of symmetrical bandwidth, giving them the flexibility to pilot a new personalized learning initiative. Hoping to foster a love of learning in all students, Ashland can now implement several new technology products, including software to help with differentiated reading, writing, and math support.

### Bringing Wi-Fi to Every Classroom

High-speed broadband that can support digital learning requires a combination of scalable broadband connections, sufficient affordable bandwidth, and robust Wi-Fi connections to support student devices in the classroom. In 2017, nearly 10,000 schools (12%) reported insufficient Wi-Fi in their classrooms, a 34% decrease from 2016.


**Chart 13: Nearly 10,000 schools still report insufficient Wi-Fi in their classrooms**



For the last three years, E-rate modernization has been delivering upgraded access to Wi-Fi into America's K-12 classrooms. By providing every school with a \$150 per student budget for the wired and wireless networks needed to deliver high-speed broadband to the classroom, E-rate has made it possible for 10,000 school districts to upgrade their Wi-Fi in the last three years — seven times as many as were able to do so in the three years prior to E-rate modernization.

However, not all districts have taken advantage of the opportunity to bring Wi-Fi to their classrooms. More than half (52%) of school districts have at least half of their E-rate Category 2<sup>5</sup> budgets remaining, and 22% (representing 4.5 million students) have not used any of their funding. **In total, \$2.35 billion of E-rate Category 2 funds remain unspent and will expire in 2020.**


Federal and state leaders must take action to ensure school districts know about the available funding and have the technical and procurement support they need to make effective use of the funds. In addition, federal policymakers can address this issue by ensuring that the E-rate program doesn't change before districts have the opportunity to use the funds that were promised to help connect their classrooms.



### *The Strength of Classroom Wi-Fi can Make or Break the Success of 1:1 Initiatives*

*"Can you imagine just being a teacher and having all of your students on Chromebooks, and ... seeing the little circle moving because you can't get to the next page?" asked Principal Dario Diaz. McFarland Unified District successfully upgraded its broadband so that every student could have an in-classroom device, but is finding that having sufficient Wi-Fi is the next challenge in supporting its classrooms and the community as a whole. "We are not solely a place that provides classes and education," said Assistant Superintendent Aaron Resendez. "We are a place that connects parents, we connect with our community, we provide resources that oftentimes they wouldn't get elsewhere and Wi-Fi is part of that." For students who cannot afford Wi-Fi access at home, having a reliable connection at school is paramount to their academic achievement.*

<sup>5</sup> Items classified by the FCC as Category 2 services include: "internal connections, basic maintenance, and managed Internal broadband services (more commonly described as managed Wi-Fi)."

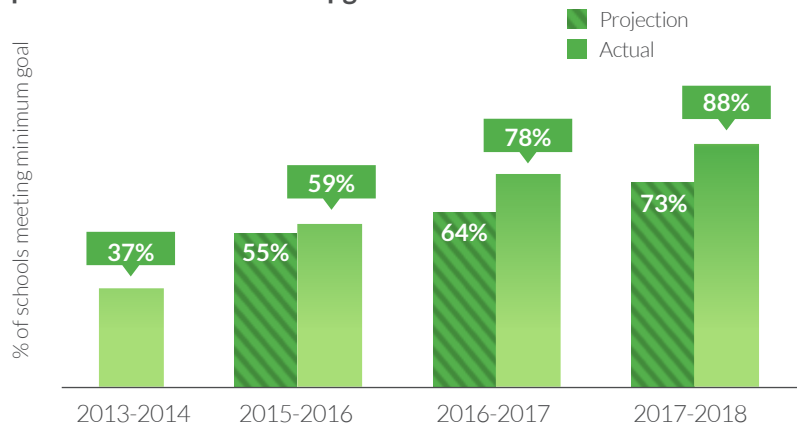
A young man with curly hair and a goatee, wearing a white and blue baseball-style t-shirt, is smiling and looking towards a young woman. The woman has long, wavy brown hair and is wearing a yellow top, also smiling. They are outdoors in a bright, sunny setting with blurred greenery in the background. A semi-transparent green overlay covers the entire image, and a white rectangular box with a green border is centered over the couple. Inside this box, the text "E-RATE MODERNIZATION CATALYZES PROGRESS" is written in a bold, black, sans-serif font, arranged in three lines.

**E-RATE  
MODERNIZATION  
CATALYZES PROGRESS**

# How E-rate modernization became the catalyst for digital equity in schools

In 2014, the FCC modernized the E-rate program with the objective of closing the K-12 digital divide within five years. This catalyzed a sea change in the broadband available in America's schools, and as a result 35 million students have been connected to digital learning and educational opportunity.

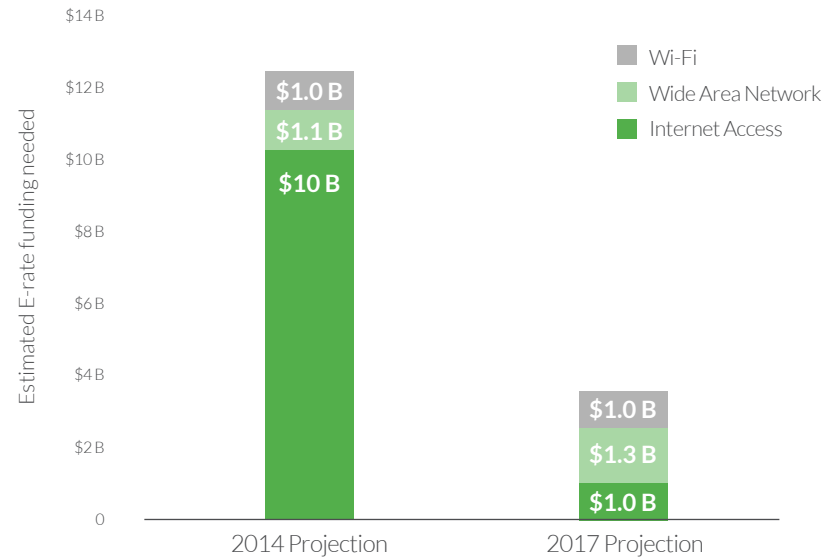
**Chart 14: E-rate modernization has dramatically accelerated the pace of K-12 broadband upgrades**



The impact of E-rate modernization is most evident in the acceleration of the pace of upgrades in K-12 broadband networks. As seen in Chart 14, we have connected 22% more schools to the broadband they need for digital learning than was expected prior to E-rate modernization. This puts us roughly two years ahead of schedule in reaching the goal of connecting 100% of America's schools to the FCC's 100 kbps per student goal.<sup>6</sup>

The success of E-rate modernization can also be seen in its impact on the cost effectiveness of the program. In 2014, it was projected that meeting the FCC long-term goal of 1 Mbps per student of Internet access would cost E-rate \$11 billion per year<sup>7</sup> – without any funding for Wi-Fi. Today, thanks to the impact of E-rate's price transparency provisions on broadband costs, meeting the 1 Mbps goal is projected to cost just \$3.3 billion per year, including \$1 billion per year for Wi-Fi upgrades.<sup>8</sup>

**Chart 15: E-rate modernization has reduced the cost of meeting the FCC's long-term connectivity goal by more than \$8 billion per year**



<sup>6</sup> Projections prior to E-rate modernization anticipated 100% of schools would reach the FCC 100 kbps per student goal by the start of the 2021 school year and that 91% of schools would meet the FCC's goal by the start of the 2020 school year. [Connecting America's Students: Opportunities for Action](#) (April, 2014).

<sup>7</sup> [Connecting America's Students: Opportunities for Action](#) (April, 2014).

<sup>8</sup> The \$3.3 billion annual projection reflects the amount for traditional public schools only. Approximately 43% of E-rate funds go to other applicants including libraries as well as private, charter, and alternative schools.



## Why has E-rate modernization worked so well?

The success of E-rate in delivering on our nation’s promise to connect all of America’s students has been driven by five key actions:

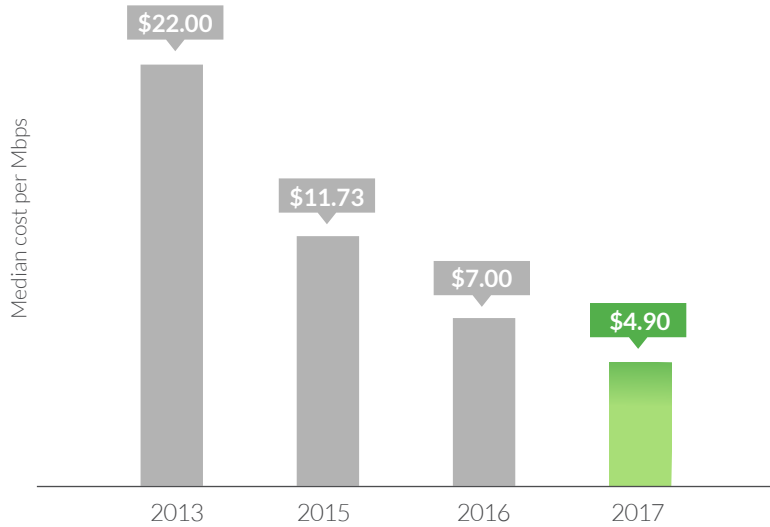
### 1. Setting clear connectivity goals

By setting explicit connectivity and infrastructure goals for schools, the FCC empowered school districts and states to recognize and take action on the important role broadband infrastructure plays in digital learning.

### 2. Improving affordability through price transparency

By making available all data about the broadband that schools were buying, from whom and at what price, the FCC created price transparency in the K-12 broadband market. This has led to lower costs and dramatically more bandwidth for schools.

**Chart 16: The cost of K-12 Internet access has declined 78% in the last 4 years**



### 3. Driving the expansion of fiber networks

The FCC recognized that access to digital learning required schools to have access to modern broadband infrastructure, and that for the vast majority of schools this meant connecting them to fiber. To accomplish this, the FCC expanded the use of E-rate funds to pay for fiber construction costs (special construction), gave schools access to the same competitive choices as businesses, and created incentives for states to provide resources for fiber construction.

These changes have been embraced by state and district leaders, reduced the number of schools without fiber by 90%, and remain critical to finishing the job of closing the connectivity gap.

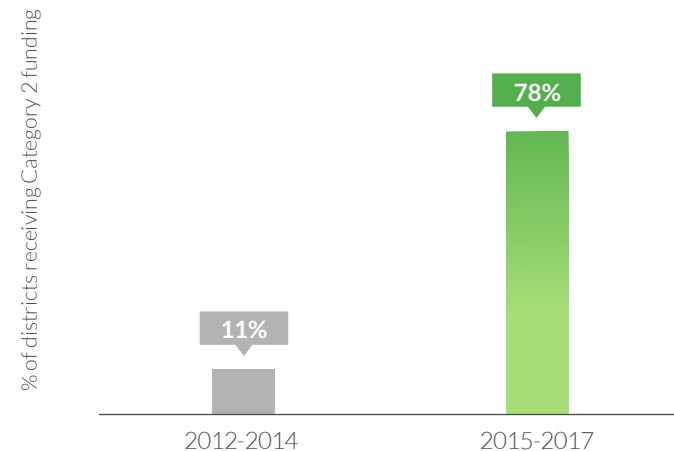


In 2017, there was  
**\$219 M**  
 requested for special construction,  
 that benefited:  
**337**  
 school districts

### 4. Bringing Wi-Fi to every classroom

Prior to E-rate modernization, few schools had received funding to put Wi-Fi in their classrooms. By increasing the resources available in the E-rate program and allocating to every school a \$150 per student Wi-Fi budget, the FCC dramatically increased the percentage of schools that have received Wi-Fi funding, more than tripled the number of schools with robust Wi-Fi, and paved the way for every classroom to be connected by 2020.

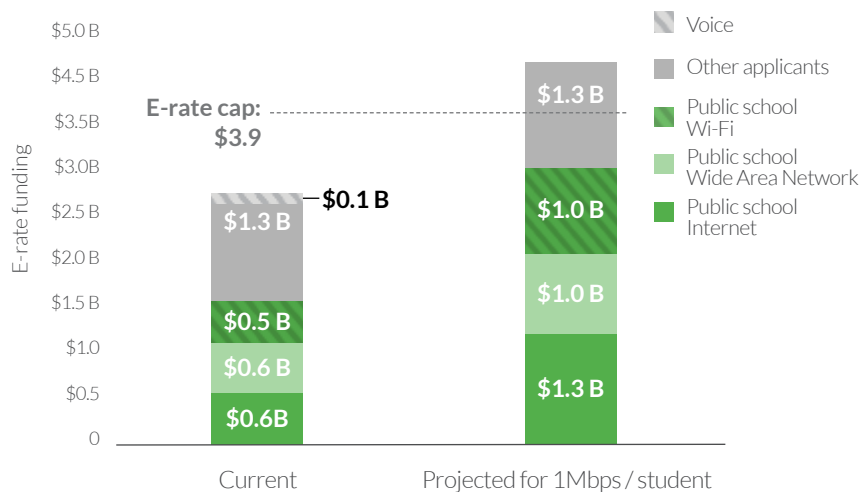
**Chart 17: E-rate modernization dramatically increased the number of school districts receiving Wi-Fi funding**



**5. Focusing on broadband**

Eliminating outdated services such as pagers and voice telephony has freed up the resources required to deliver on the FCC’s connectivity promise both today and in the future. Combined with improvements in affordability, we are now significantly closer to being able to meet the FCC’s long-term K-12 broadband goals within the current E-rate budget.

**Chart 18: Reinstating voice or other outdated services will jeopardize the ability of E-rate to help districts meet the FCC’s long-term connectivity goals within its current budget**



**Ensuring the stability of the E-rate program through 2020 and beyond is critical to delivering on our promise to connect America’s K-12 students.**

The E-rate program has been the foundation for dramatic progress toward our goal of bringing high-speed broadband to every public school classroom. To fulfill the FCC’s promise to America’s K-12 students, it is essential that the Commission preserve key elements of the current E-rate program through 2020:

- 1. Allow districts the full five years they were promised** to utilize their \$150 per student Category 2 budgets to complete their Wi-Fi upgrades.
- 2. Simplify and continue access to the same competitive fiber options available to businesses**, including dark fiber and self-provisioning made available by E-rate modernization.

**3. Maintain the current funding cap** to ensure that districts have the resources required to bring fiber to every school and meet the FCC’s long-term goal of 1 Mbps per student of Internet access.

**4. Reaffirm the focus on broadband** by resisting calls to reinstate outdated services.

**5. Preserve the needs-based approach to allocating E-rate funds** to ensure that E-rate continues to serve schools that need it most.

At the same time, the Commission should follow through on the objectives it laid out during the FCC’s August 2017 [Rural Broadband Month](#) and take steps to accelerate the expansion of fiber networks to rural America by:

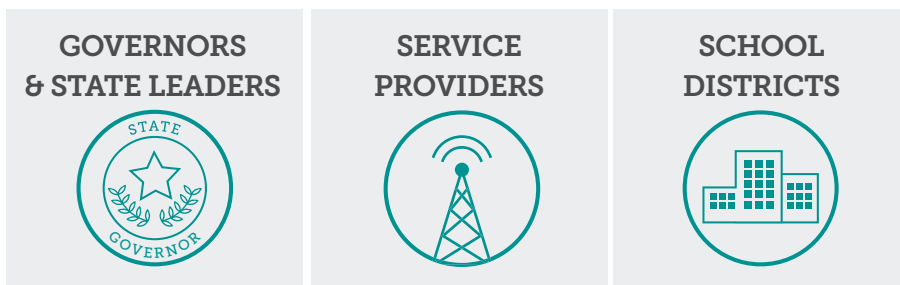
- 1. Accelerating the pace of approvals** by eliminating frequent rule changes and streamlining lengthy bureaucratic reviews of fiber projects that are delaying educational opportunity for the hardest-to-reach kids — those whom E-rate was originally designed to help.
- 2. Fully leveraging the FCC’s investment in rural broadband** by allowing service providers to dig once and pull extra fiber in E-rate-funded trenches to serve the entire community in places where E-rate brings high-speed broadband to a school or library.
- 3. Addressing the district fiber funding gap** by using funds already available in E-rate to help service providers bring fiber to all rural schools. This can be accomplished by increasing the E-rate reimbursement for fiber construction to 90% whenever states put up 10%.

With E-rate, we can close the school connectivity gap by 2020. Without it, we will fail to deliver on our promise to America’s students.

A photograph of two young boys in school uniforms sitting at a desk in a classroom. The boy on the left is holding a tablet and smiling broadly, while the boy on the right looks on with interest. The background is a blurred classroom with posters on the wall. A teal overlay covers the entire image, and a teal-bordered box is centered over the boys' faces.

**ACTION PLANS**

## Your action plan



### Your role in making sure that we can fulfill our promise to America's students by 2020.

With 6.5 million students still without the broadband speeds they need and more than 2,000 schools disconnected from 21st-century broadband infrastructure, it is clear that there is more work to be done to finish the job of connecting all of America's students to the transformational power of digital learning. By taking action, governors, service providers, and school districts can accelerate the pace at which our nation fulfills its promise to connect America's students.

### Governor & State Leader Action Plan

Connecting America's students to high-speed broadband is a bipartisan issue; for the past three years, governors from both parties have taken action to increase access to educational opportunity. In 2017, executive leadership enhanced the likelihood that districts upgraded to meet FCC connectivity goals, and accelerated the pace of fiber and Wi-Fi upgrades. They accomplished this by taking action in the following areas:

- ▶ **Set connectivity goals:** Governors across the country established and communicated specific connectivity goals for their states and then took action to identify which districts in their states needed to upgrade to meet these goals. By doing so, they helped emphasize broadband upgrades as a priority for superintendents and school boards.
- ▶ **Engage service providers:** Recognizing the important role service providers play in closing the fiber gap and improving broadband affordability, governors convened groups of service providers to upgrade schools. Galvanizing the support of service providers has increased the number of bids school districts receive through RFPs. It has also encouraged providers to extend their fiber networks to nearby districts, and has created a win-win environment where service providers are viewed as partners in delivering schools more bandwidth for their broadband budget.
- ▶ **Establish state matching funds:** 18 governors are accelerating the pace of fiber deployments to underserved school districts and communities by eliminating or reducing the need for districts to come up with capital for upfront construction costs. This makes it possible for service providers to extend their fiber networks to areas they were previously unable to reach

### Governor Engagement Helps Arkansas Connect 100% of its Students

In 2015, Arkansas brought high-speed broadband to Fort Smith Schools. Though the district was the first to connect to the state's newly upgraded K-12 education network, it was far from the last. The active, continuous involvement of Governor Asa Hutchinson, combined with the support of the Arkansas Department of Education and the state's service provider community, enabled phenomenal progress in connecting the state's K-12 students. In July of 2017, Governor Hutchinson [announced](#) that 100% of Arkansas students have not only met the minimum connectivity goal of 100 kbps per student, but now have 200 kbps or more in broadband connectivity. This is a particularly celebratory moment for a state with a high percentage of rural districts.

based on cost justification. In addition, some states are accelerating Wi-Fi upgrades by providing districts with some or all of the necessary matching funds to leverage E-rate Category 2 subsidies.

- **Make broadband affordable:** States are directly improving school district purchasing power by aggregating the procurement of broadband under statewide RFPs and rebidding out-of-date state broadband contracts. They are also helping districts get more bandwidth for their budget by providing access to price transparency tools and connecting districts with additional service providers during the procurement process (see [Compare & Connect K-12](#)).

**Chart 19: 46 governors are leading K-12 broadband upgrades**



- **Provide technical and procurement assistance:** In many districts, the inability to upgrade their broadband thus far is primarily a function of overburdened IT departments not having the time or support to pursue upgrades. Governors are addressing this issue and accelerating upgrades by providing districts with technical and procurement support. This facilitates the preparation of RFPs, maximizes competition, and improves the overall effectiveness of district-led broadband procurements.

In 2017, governors continued increasing their commitment to upgrading schools -- launching statewide upgrade programs, establishing fiber matching funds, and encouraging service providers to expand fiber networks. The map above identifies the governors who have committed to delivering on America's promise of digital equity for all of our K-12 students. Every governor who has taken office since 2016 has publicly committed to taking action and some have already made significant progress in upgrading their schools.

## Service Provider Action Plan



In 2017, the percentage of service providers delivering the minimum recommended bandwidth for digital learning to 100% of the students they serve rose from 61% to 77%. These service providers understand the important role they play in delivering on America's promise to connect our K-12 students. They are also taking advantage of the considerable opportunities to leverage E-rate funding to expand their networks and grow their businesses.

As school districts adopt digital learning in classrooms, the demand for K-12 bandwidth continues growing nearly 30% year over year. This growth is driving districts to upgrade to the FCC's 2018 goal of 1 Mbps per student of Internet access — a level 22% of districts have already reached. As a result, there are likely to be meaningful increases in broadband spending by school districts over the next few years. Service providers can take advantage of the opportunities inherent in bridging the K-12 connectivity gap in the following ways:

- **Use E-rate open data to identify districts requiring upgrades:** E-rate modernization made public all of the applications for funding submitted by school districts and consortia. Service providers can use the [Universal Service Administrative Company's Data Retrieval Tool](#) and websites like [Compare & Connect K-12](#) as a lead generation source to identify which districts need bandwidth, fiber, or Wi-Fi upgrades.



### With Greater Bandwidth, Digital Learning Possibilities Are Endless

*As a former teacher, Technology Director Tim Grant of Warren County Public Schools in Virginia is familiar with the frustration of slow Internet speeds impeding classroom instruction. He recalls, "Six years ago, I was an instructional tech teacher and we did an activity on Google Maps. Third-grade students could look at different times in history and see layers of ancient Rome. But at the time, only about three of the students in the class had [the simulation] work because the Internet was so slow." Fast-forward to today, and all students at Warren County Public Schools have access to digital learning thanks to Tim's vision for a faster network. Tim was able to work with his service provider and increase his district's bandwidth from 250 Mbps to 1 Gbps. Slow Internet is now a problem of the past for his district, and Tim is gearing up for a successful 1:1 device rollout for students in every classroom.*



- ▶ **Leverage E-rate funds to extend fiber networks:** By allowing E-rate funds to be used for fiber construction and enhancing subsidies through state matching funds, the FCC has given service providers the chance to extend their fiber networks to school districts and communities that they do not yet serve.
- ▶ **Upgrade existing customers to the FCC's minimum connectivity goal:** School districts meeting the 100 kbps per student goal are half as likely to switch providers when they re-bid their contracts. Service providers can significantly improve customer retention at virtually no cost by upgrading existing customers to this standard.
- ▶ **Compete on value, not price:** With school districts focused on increasing their bandwidth, service providers can compete for business by providing more bandwidth for the budget rather than lowering the monthly recurring cost. In most cases, this can be done by simply offering districts a deal that a peer district is already receiving, making this is an attractive opportunity for service providers to win new business and retain existing customers.
- ▶ **Engage in the opportunities enabled by the E-rate program:** Service providers play a significant role in the future of E-rate. To deliver on America's promise to connect our students, and to continue growing their networks and K-12 businesses, service providers should help ensure that FCC policy allows E-rate to sustain the dramatic progress accomplished so far. Providers should also consider lending their support to common-sense improvements to the administration of the E-rate program and the clarity of rules. This type of advocacy can help ensure that service providers are able to dig once and pull extra fiber in E-rate-funded trenches that serve the entire community, particularly in places where E-rate brings high-speed broadband to a school or library.

### FIFTEEN SERVICE PROVIDERS CONNECT 2.5 MILLION STUDENTS IN 2017

Last year we identified 15 service providers that could close the bandwidth gap for 6 million students by providing significantly more bandwidth to a portion of the districts they served. In 2017, these service providers upgraded 2.5 million of these students to the FCC's minimum recommended bandwidth for digital learning. 95% of these upgrades were accomplished by simply offering districts deals that were already available to peer districts, enabling districts to upgrade at little or no additional cost. We congratulate these providers and look forward to continued progress toward the goal of connecting 100% of the students they serve in 2018.

### School District Action Plan

As district leaders, you have firsthand knowledge of the technology needs of the schools you serve. Of the people who can drive change in this mission, you also have the greatest understanding of the particular challenges your districts face in procuring and sustaining sufficient connectivity.

- ▶ **Assess future bandwidth needs:** While you cannot predict exactly what digital learning needs you'll have in the future, it's important to plan at least three years ahead before you sign new contracts with providers. Make sure that the bandwidth you decide on and include in your upgrade request for proposal serves not only the current needs of your district, but those that may arise in the years to come. 22% of school districts are already meeting the FCC's 1 Mbps per student Internet access goal — how soon will you need to get there?
- ▶ **Expand the options on your Form 470 or RFP to maximize bids:** Many districts have found that submitting stronger Form 470s and RFPs makes a tangible difference in the quantity and quality of provider bids they receive. Including broader ranges of bandwidth and adding opportunities for vendors to bid on alternative fiber options are just some of the ways that you can maximize competition and interest in your upgrade. Seek external support with those forms and their corresponding follow-up processes if you have concerns about the time or resources needed to complete them.

- ▶ **Investigate the deals your peers are receiving:** Upgrading can seem financially daunting, but it is often possible for your district to lower its cost per Mbps, which means that you can get more bandwidth for your budget. Talk to other districts in your area about the service providers they are using and the broadband deals they are receiving. Chances are you can increase your broadband without spending more money.
- ▶ **Be open to switching providers:** If the pricing or bandwidth you are offered is not sufficient to meet your needs, it is important to seek other options, even if you have had a long-standing relationship with your current provider. In areas served by more than one provider, exploring other options can be a great way to ensure that you are truly getting the best deal possible.
- ▶ **Elevate the priority of funding broadband infrastructure projects:** With only two years remaining to take advantage of Category 2 budgets and fiber matching funds, the time to act is now. School boards, superintendents, and all district leadership involved in setting budgets must make it a priority to invest in broadband infrastructure today to ensure the foundation is set to support a district's future digital learning plans.

America has made tremendous progress in bringing high-speed broadband to its public school classrooms. The task now falls to governors, federal policymakers, service providers, and districts, working in partnership, to finish the job of connecting every student to educational opportunity. Each state has its own unique challenges and opportunities, but by setting goals and focusing on closing the bandwidth, fiber, and Wi-Fi gaps, our combined efforts can ensure that America delivers on the promise it made to close the connectivity gap and level the playing field for children across the nation.



## **Fulfilling the promise to close the K-12 connectivity gap (for good)**

The progress your actions have made possible in the past four years demonstrates we can deliver on our nation's promise by 2020.

Let's finish bringing equal digital access  
to *all* of America's schools.

A blurred background of a laptop on a desk. A white rectangular box with a black border is centered on the screen, containing the text "ABOUT THE DATA" in a bold, black, serif font.

**ABOUT THE DATA**

## About the report

The State of the States report tracks progress toward the K-12 connectivity goals established by the Federal Communications Commission (FCC)<sup>9</sup> and provides state leaders with the information they need to finish the job of connecting America's students to high-speed broadband. The report, published annually, highlights national and state progress toward achieving connectivity goals and the key requirements for meeting future connectivity needs: access to fiber or equivalent high-speed infrastructure, sufficient Wi-Fi equipment in classrooms to support 1:1 digital learning, and affordable pricing.

States are critical actors in the effort to provide and improve broadband access for K-12 students. School connectivity is often strongest in states where focused action has been taken by state leadership and state agencies. For that reason, the accompanying website at [stateofthestates.educationsuperhighway.org](http://stateofthestates.educationsuperhighway.org) provides insights, broken down by state, to help state leaders see where they stand relative to the FCC connectivity goals, understand potential actions they can take to dramatically improve broadband connectivity in schools, and find out what their state peers are doing.

---

<sup>9</sup> See FCC Report and Order and Further Notice of Proposed Rulemaking, WC Docket 13-184, released July 23, 2014, ¶ 22-62, [https://apps.fcc.gov/edocs\\_public/attachmatch/FCC-14-99A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/FCC-14-99A1.pdf)



## About the data

The analysis in this report is based on application data from the FCC's Schools and Libraries Program ("E-rate"). It includes data from 11,038 public school districts, representing more than 39 million students in approximately 73,000 schools across all 50 states and the District of Columbia. These applicants requested \$1.2 billion in funding from the E-rate program. All E-rate applications are subject to review before funds are distributed, which ensures that school districts have accurately reflected their requested services. As a result, this data represents the best national source of current information on school district connectivity; specifically, what broadband services schools are buying and how much they are paying for these services.

---

<sup>10</sup> The Schools and Libraries Universal Service Support Program, commonly known as the E-rate program, helps schools and libraries obtain affordable broadband. Eligible schools, school districts, and libraries may apply individually or as part of a consortium. Funding may be requested under two categories of service: Category One services to a school or library (telecommunications services, and Internet access), and Category Two services that deliver Internet access within schools and libraries (internal connections, basic maintenance of internal connections, and managed internal broadband services). Discounts for support depend on the level of poverty and whether the school or library is located in an urban or rural area. The discounts range from 20 percent to 90 percent of the costs of eligible services. E-rate program funding is based on demand up to an annual Commission-established cap of \$3.9 billion. See FCC, E-rate, <https://www.fcc.gov/encyclopedia/e-rate-schools-libraries-usf-program> 45

For the last three years, EducationSuperHighway's team of 25 analysts, data quality specialists, and developers has been verifying and analyzing the 2015-2017 E-rate data. Over this period, the team has placed particular emphasis on clarifying the broadband services contained in E-rate applications by working closely with school districts, state partners, and E-rate consultants to verify that the data accurately represents the services they receive.

Our data verification and analysis efforts supplied us with a comprehensive understanding of connectivity for each school district included in the sample. We then calculated state-level metrics based on a sample of the total school districts in each state, which on average included 85% of districts. As with any sample-based methodology, there is a small margin of error to consider when interpreting state-level results. Regardless, we believe that this report identifies specific actions states can take to improve connectivity in America's K-12 public schools. We will continue to report on our national progress every year to help state leaders close the K-12 digital divide before the end of the decade.

For more about our data and metric calculations, please [view the full-version of the methodology](#).

A digital version of this report is available at [stateofthestates.educationsuperhighway.org](http://stateofthestates.educationsuperhighway.org). To fully leverage the potential of the open E-rate data, the district-level connectivity and procurement information upon which the analysis of this report is based is available on *Compare & Connect K-12* at [www.compareandconnectk12.org](http://www.compareandconnectk12.org), a tool designed to help school districts increase the effectiveness of their network procurement and to help state leaders and service providers identify which school districts need to upgrade their networks.

## About EducationSuperHighway

EducationSuperHighway is the leading non-profit focused on upgrading the Internet access in every public school classroom in America. We believe that digital learning has the potential to provide all students with equal access to educational opportunity and that every school requires high-speed broadband to make that opportunity a reality.

Our work focuses on catalyzing federal and state action on K-12 broadband initiatives and accelerating upgrades in school districts by connecting them to competitive service provider options. We are currently working with governors in 22 states covering more than 21 million students and providing technical and procurement support to hundreds of school districts. Our *Compare & Connect K-12* online tool helps schools, state leaders, and service providers view broadband services and bandwidth information for school districts nationwide so they can get and deliver more bandwidth for their broadband budgets. As a non-profit, our tools and services are offered free of charge.

EducationSuperHighway is funded by national philanthropic organizations, including the Chan Zuckerberg Initiative and the Bill and Melinda Gates Foundation, and our mission is supported by America's leading CEOs.