



Grow with us

CoSN's E-rate and Broadband Survey 2013



Final key findings from a survey conducted
in the fall of 2013 by **CoSN** and Market Data
Retrieval (MDR)

October 2013 (rev. Nov. 2013)



CoSN (Consortium for School Networking)
1025 Vermont Avenue, NW, Suite 1010
Washington, DC 20005
202.861.2672
www.CoSN.org
info@CoSN.org

Please visit www.CoSN.org/eratesurvey to download this report in PDF format.



This work is licensed under a
[Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License](https://creativecommons.org/licenses/by-nc-nd/3.0/).

CoSN's E-rate & Broadband Survey 2013

Table of Contents

Key Findings	2
E-rate Overview	4
Standards and Goals	7
Connectivity Needs, Priorities, and Barriers	8
Internal Connections—Wired and Wireless	10
Costs	14
Telephony—POTS	17
VOIP	18
Providers	20
Consortiums	21
Findings and Recommendations	22

CoSN's E-rate & Broadband Survey 2013

In August and September of 2013 CoSN partnered with MDR (Market Data Retrieval) to survey school district leaders from around the United States on E-rate, broadband and education networks. This first-ever CoSN E-rate survey offers insight into access and connectivity challenges educators face as the growing demand for bandwidth intensifies with mobile learning, online assessments, and digital content. The survey will inform critical choices the Federal Communications Commission (FCC) must make over the coming months regarding the E-rate program. Finally, we believe this survey provides a path for educators interested in making a digital leap by giving clarity to pressing challenges around attaining robust education networks that are suitable to today's learning environment.

Key Findings

- **The current E-rate funding level is inadequate to meet the demands of creating a robust broadband infrastructure in schools. While it has been widely reported that annual E-rate requests for funding are more than double the amount available under the current funding cap, even this statistic understates the true demand. This survey shows that 29% of districts reported they did not apply for some E-rate funding because they expected insufficient funds. In addition, the following survey results demonstrate an overwhelming need for more investment as a nation in our school infrastructure.**
- **43% of the school districts indicated that none of their schools can meet the goal of 100Mbps of internet access per 1,000 students today. This goal has been advocated by the State Education Technology Directors Association¹ (SETDA) and the LEAD Commission Blueprint² and reinforced by President Obama ConnectED³. Only one quarter of districts responded that 100% of their schools meet the goal.**

CoSN surveyed over 29,000 district technology leaders and received 469 responses in approximately two weeks. This level of response has a less than 5% margin of error with a confidence rate of more than 95%. Responses came from 44 states (Delaware, Vermont, South Carolina, Vermont, Utah and Hawaii not reporting), with diverse geographic types and sizes which reflect the overall landscape of schools in our country today.

¹ SETDA, The Broadband Imperative: Recommendations to Address K-12 Education Infrastructure Needs (2012), http://www.setda.org/c/document_library/get_file?folderId=353&name=DLFE-1517.pdf

² LEAD's National Education Technology Initiative: A Five-Point Plan (2013), <http://www.leadcommission.org/sites/default/files/LEAD%20Commission%20Blueprint.pdf>

³ ConnectED: President Obama's Plan for Connecting All Schools to the Digital Age (2013), http://www.whitehouse.gov/sites/default/files/docs/connected_fact_sheet.pdf

- **Districts identified bandwidth access as the most important priority for E-rate funding, followed by wireless in schools. School Local Area Network (LAN) connectivity and District Wide Area Network (WAN) connectivity were also mentioned.**
- **School networks are not currently able to support broadband because of problems with internal connections/wiring, backbone in the school LAN, and wireless networks. The combination of these factors means that:**
 - 57% of districts do not believe their school's wireless networks currently have the capacity to handle a 1:1 deployment.
 - Half school buildings have wiring that is in part older, slower (Cat5 and Cat3) that will not carry data at broadband speeds.
 - 26% of districts are using slower backbones (copper or wireless) in their school LAN.
- **Rural schools pay six times more for connections than other schools/school systems. Likewise, very large school districts (+50k students) spend over three times more for WAN than other schools/school systems.** A one-size, per pupil E-rate formula will likely not meet the needs of these situations given these significant cost disparities.
- **While focusing E-rate funding on broadband connections versus traditional telephone services makes sense, a transition period will be necessary since many school districts still have traditional telephone (POTS) systems and a large portion of districts receive E-Rate funding for them.** Over 28% of districts indicated that POTS discounts were 50% or more of their current E-Rate funding.

On September 16, 2013, CoSN released the preliminary key findings from this survey. Below are final results with 469 districts responding (up from 447). There was no substantial change.

- 99% of districts need additional Internet bandwidth and connectivity in the next 36 months.
- 93% percent of districts believe current E-Rate funding does not fully meet their needs.
- The two biggest barriers for schools are ongoing monthly costs (79% agreement) and cost of capital or upfront/nonrecurring expenses (59% agreement).
- 20% of districts identified geography as a barrier to increasing connectivity in their schools, and 10.5% indicated their Internet providers were either at capacity or could not expand capacity.
- Only 57% of elementary schools and 64% of secondary schools have all classrooms fully equipped with wireless Internet connectivity.
- 44% of districts participate in consortium buying, including 37% for internet bandwidth. Many districts participate in more than one purchasing cooperative.

E-rate Overview

E-rate funding impacts nearly all school systems. 94.8% of our survey respondents receive Priority 1 funding (telecommunications & Internet access). Only 1.6% of the respondents indicated that they do not receive any E-rate funds.

Due to the current cap on E-rate funding, a much smaller percentage of districts— 24% —receive Priority II funding (internal connections for high poverty schools). Another 18.1% indicate that they regularly apply for Priority II funds but never receive them. And 37% of districts indicated that they need Priority II funds, but don't apply because funding has been so limited.

Size of District		
Answer Options	Response Percent	Response Count
Under 2,499	42.2%	198
2,500-14,999	40.5%	190
15,000-49,999	13.2%	62
Over 50,000	4.1%	19
<i>answered question</i>		469

Chart 1

Type of District (according to E-rate)		
Answer Options	Response Percent	Response Count
Urban	23.5%	109
Suburban but designated Urban	26.5%	123
Rural	50.0%	232
<i>answered question</i>		464

Chart 2

Only 7.5% responded that E-rate funding fully met their needs. This contrasts with the FCC’s 2010 E-rate Program and Broadband Survey⁴, which found that 20% of the respondents’ needs were fully met. This change over time highlights the growing gap between available E-rate funds and the demands of robust digital learning environments for students.

Which of the following best describes how the current level of E-Rate funding meets the needs of your district?

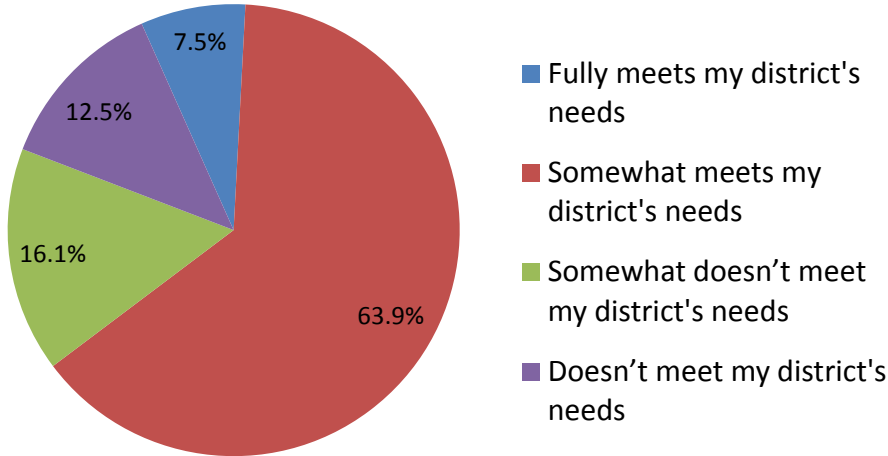


Chart 3

⁴ 2010 E-Rate Program and Broadband Usage Survey: Report, DA 10-2414, 26 FCC Rcd. 1, 2(2010), http://transition.fcc.gov/010511_Eratereport.pdf.

Percentage of current E-rate discount

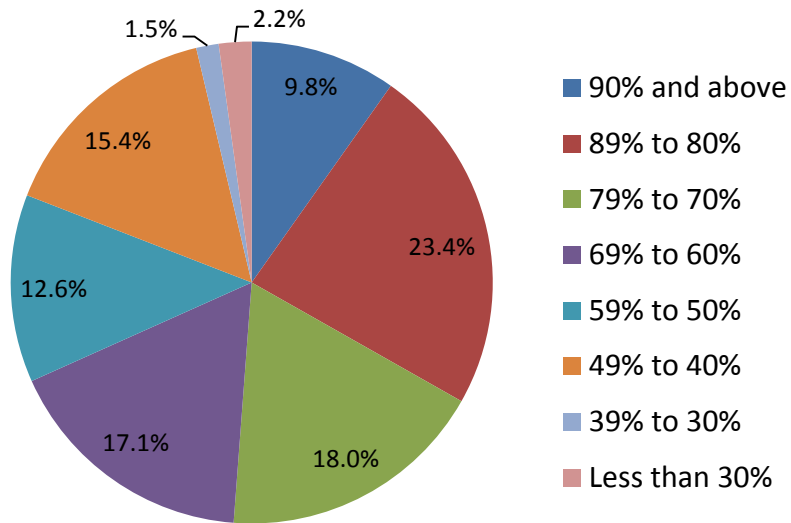


Chart 4

Do you currently receive E-rate funding? Mark all that apply.

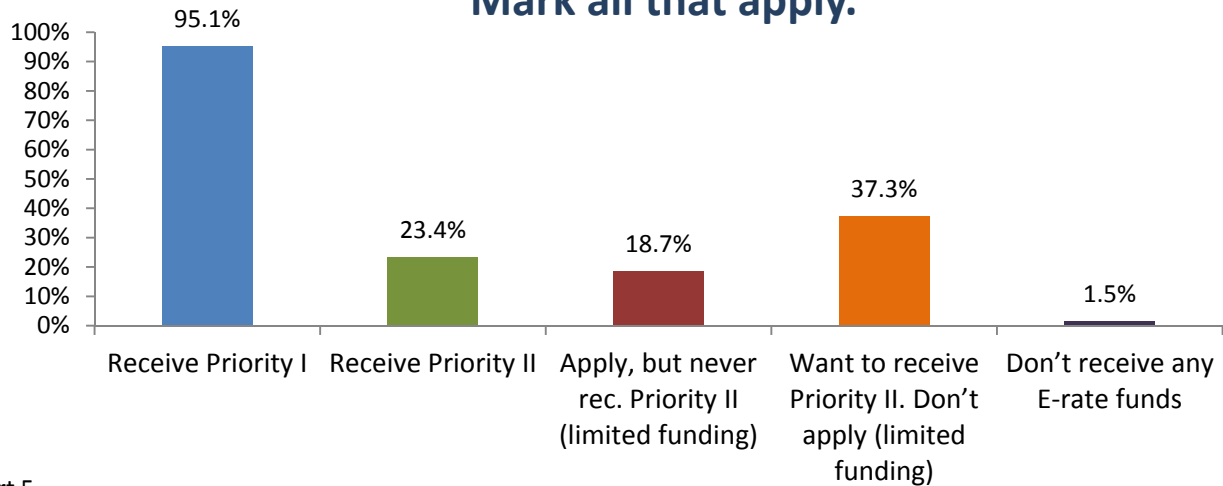


Chart 5

Standards and goals

43% of the districts indicated that none of their schools can meet recommendations from SETDA⁵, the LEAD Commission⁶ chaired by former U.S. Secretary of Education and President Obama's ConnectED Goals⁷ of 100Mbps of internet access per 1,000 students today. Only one quarter of districts responded that 100% of their schools meet that goal. There is a widening digital divide based on schools' abilities to provide adequate bandwidth for teaching and learning.

Approximately what percentage of the schools in your district have bandwidth that meets the SETDA recommendation of "100 Mbps of internet access per 1000 students today?"

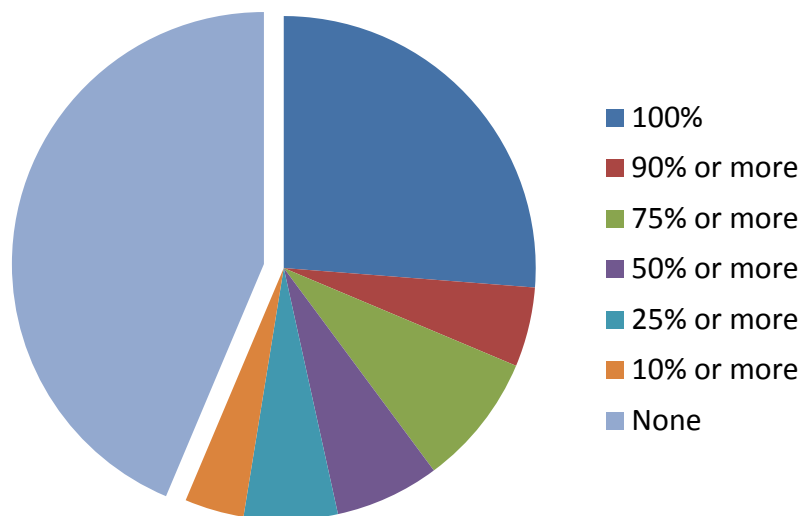


Chart 6

⁵ SETDA, The Broadband Imperative: Recommendations to Address K-12 Education Infrastructure Needs (2012), http://www.setda.org/c/document_library/get_file?folderId=353&name=DLFE-1517.pdf

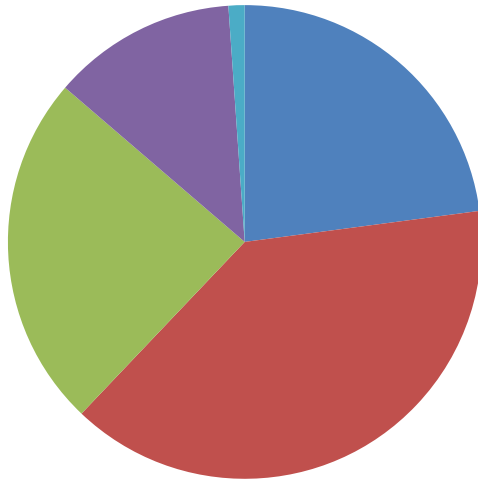
⁶ LEAD's National Education Technology Initiative: A Five-Point Plan (2013), <http://www.leadcommission.org/sites/default/files/LEAD%20Commission%20Blueprint.pdf>

⁷ ConnectED: President Obama's Plan for Connecting All Schools to the Digital Age (2013), http://www.whitehouse.gov/sites/default/files/docs/connected_fact_sheet.pdf

Connectivity Needs, Priorities, and Barriers

99% of districts indicated the need for additional bandwidth in the next 36 months.

Choose the statement below that best describes your district's connectivity and internet bandwidth needs.



- My district does not have enough connectivity to meet our current needs.
- My district has enough connectivity to meet our current needs but will need to increase access in the next year.
- My district has enough connectivity to meet our current needs but will need to increase access in the next 2 years.
- My district has enough connectivity to meet our current needs but will need to increase access in the next 3 years.
- My district has enough connectivity and will not need to increase access ever.

Chart 7

Schools ranked Internet bandwidth as the most important connectivity upgrade needed. Needs identified in rank order were:

- #1 - Internet Bandwidth
- #2 - Wireless in a school
- #3 - LAN connectivity within a school
- #4 - WAN connectivity between the school and the district

What is the most important connectivity upgrade needed in your district?

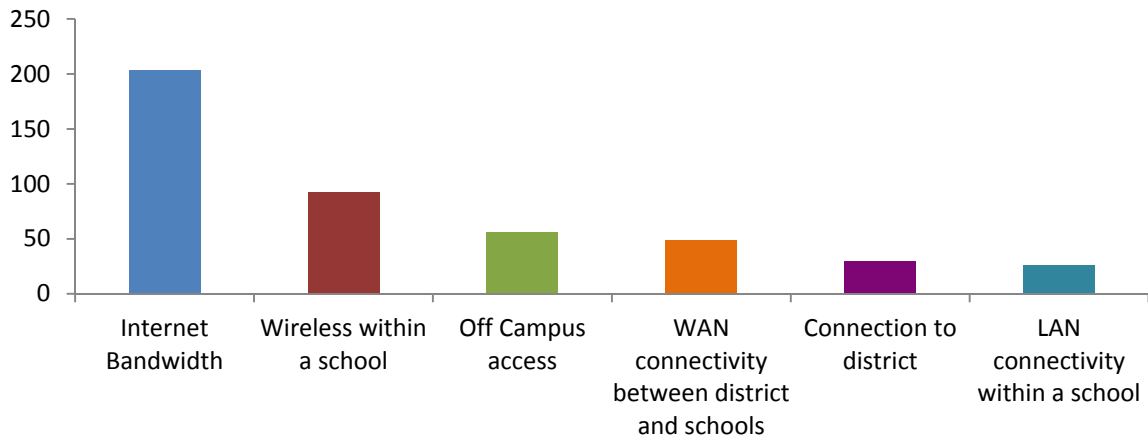


Chart 8

Respondents indicated that the **two most significant barriers to increasing bandwidth are cost-related:**

- 71% agreed that ongoing, recurring monthly costs were the largest barrier
- 59% agreed that capital or one-time costs were the other major barrier

Other statistically significant barriers were: geography (20%), transport abilities already at capacity (19%), and Internet provider abilities already at capacity (10%).

What are the most significant barriers to increasing connectivity? Mark all that apply.

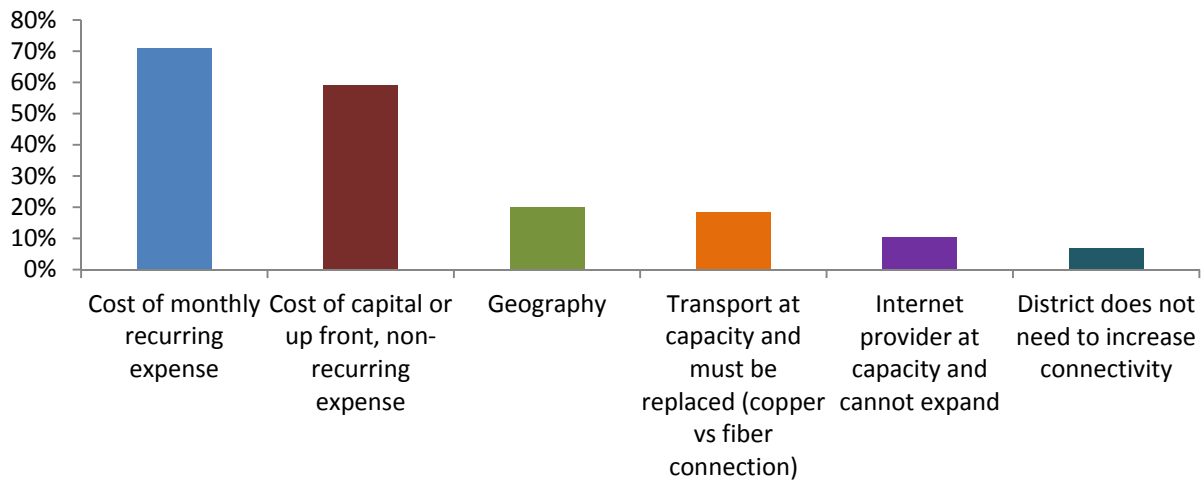


Chart 9

Internal Connections—Wired and Wireless

Elementary Classrooms with Wireless Access

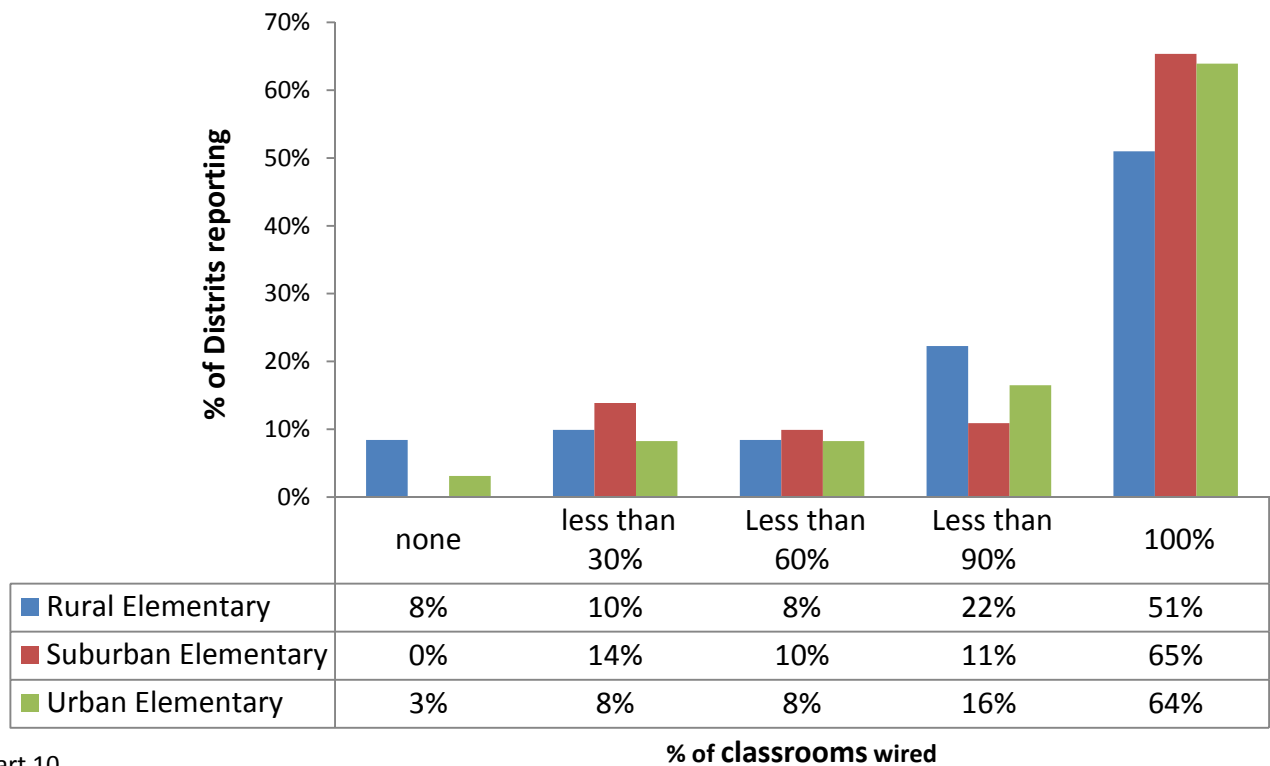


Chart 10

% of classrooms wired

The survey looked at several topics around the internal school LAN as well as the broadband connection data above. Most districts indicated that there was a wired connection to every classroom. Yet only 57% of the elementary schools and 64% of the high schools have 100% of the classrooms set up for a wireless connection.

There also is a geographic digital divide with lower wireless classroom access available in rural schools. Only 51% of rural elementary schools have wireless access in 100% of their classrooms, and 8% have no wireless access. While suburban and urban schools have slightly better coverage for wireless access, no district reports full access in more than 71% of its schools. Across all geographic categories, almost 1/3 of the schools reported lacking wireless access in some classrooms.

Middle School Classrooms with Wireless Access

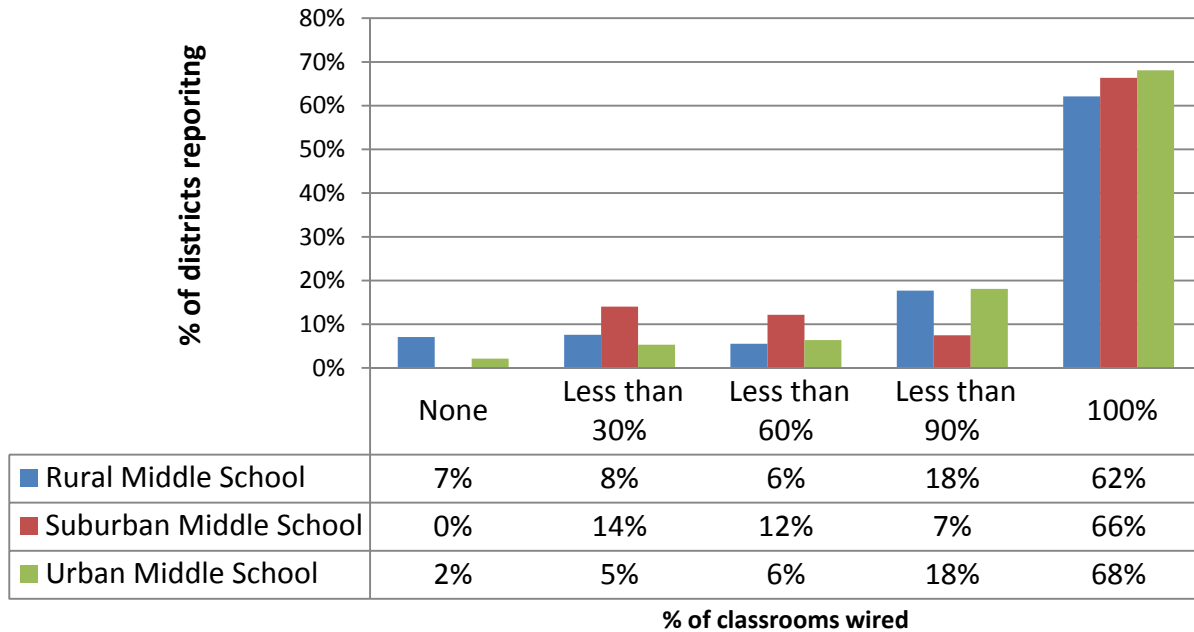


Chart 11

High School Classrooms with Wireless Access

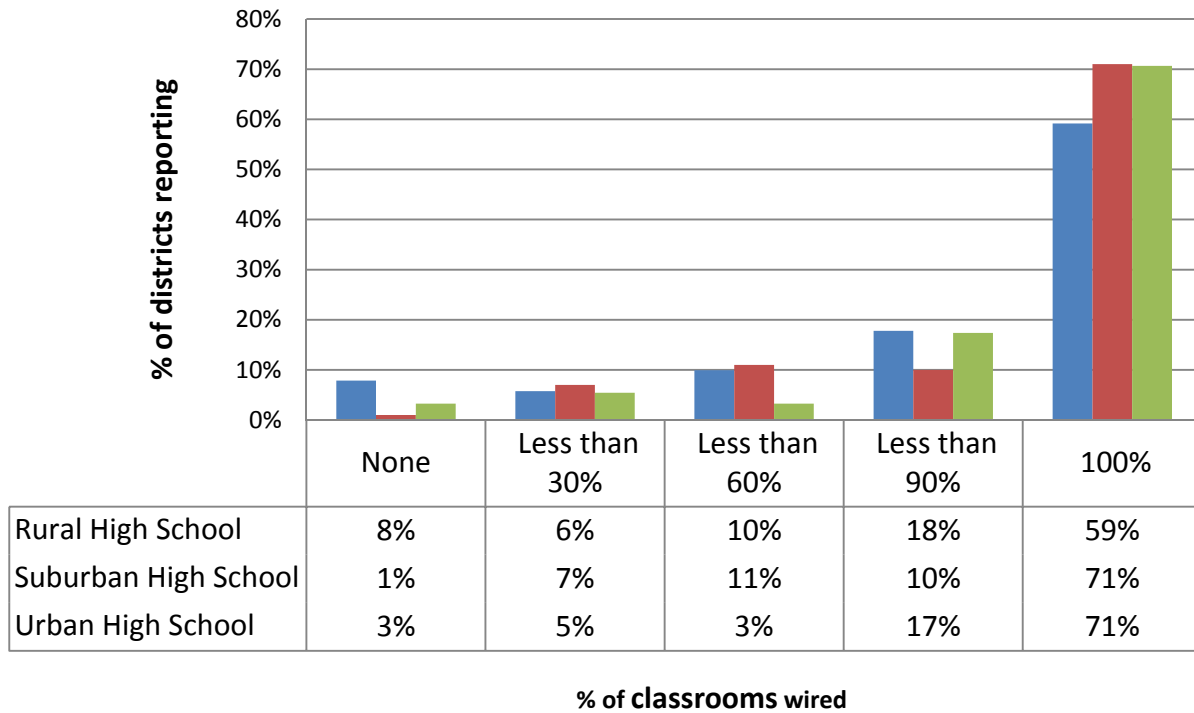


Chart 12

Over 75% of the districts responding indicated that their wireless access points could carry high speed data at 802.11n speeds (100 MB) or better, indicating that schools are buying wisely. However, the facts that many classrooms do not have access to wireless and that districts identified wireless in schools as the second highest priority for high speed access indicate that they have not yet been able to deploy enough access points to satisfy increasing capacity demands due to new digital resources, online assessments, BYOD, and 1:1 initiatives.

In fact, 57% of districts do not believe their school’s wireless networks have the capacity to handle a 1:1 deployment today. And as the new 802.11ac standard, with even faster speeds, rolls out this year, it will further disadvantage those with slower a/b/g access points.

How confident are you that the typical school’s wireless network would have the capacity to handle a 1:1 deployment this fall?

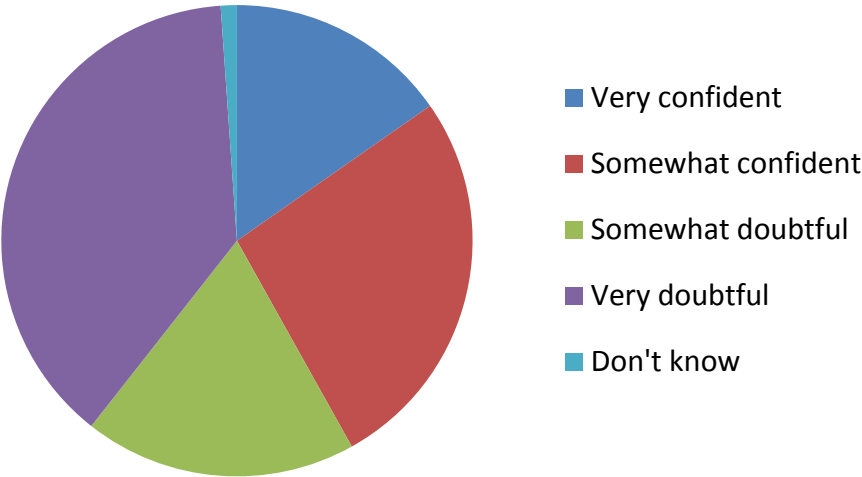


Chart 13

The survey identifies wiring as another major challenge. **Districts report that half of school buildings use, in part, older and slower wiring (Cat5 and Cat3) that will not be able to carry data at the speeds needed today.**

What type of wiring is used in your typical school building today? Mark all that apply.

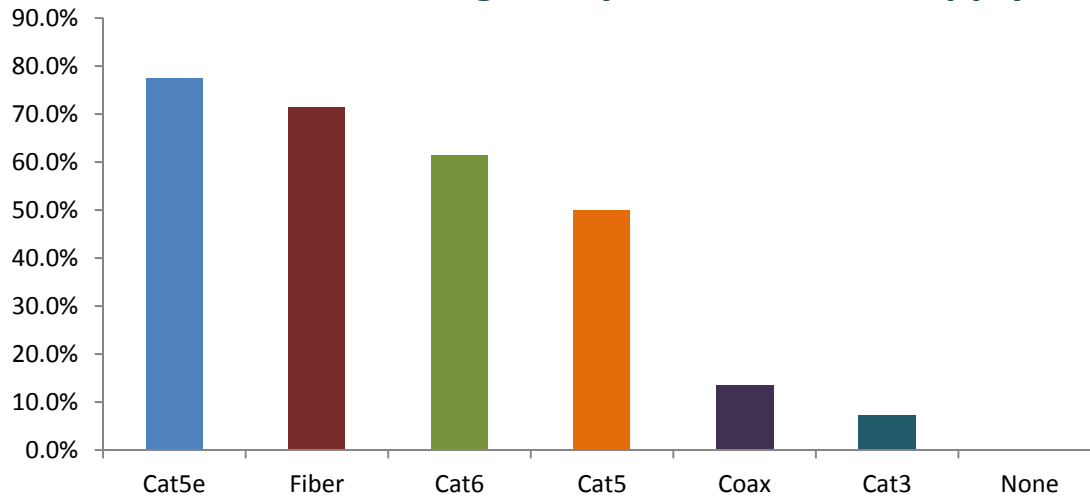


Chart 14

The backbones in school LANs are another serious problem. **26% of districts are using slower copper backbones and 2.3% are using wireless backbones in their school LAN.** The backbone in a school LAN provides the high speed connection from the point that broadband enters the building to connecting points throughout the building. Like a major vein or artery to the heart, the backbone must be able to collect and distribute data at high speeds or the entire system fails.

What type of Backbone within the building does your typical school have?

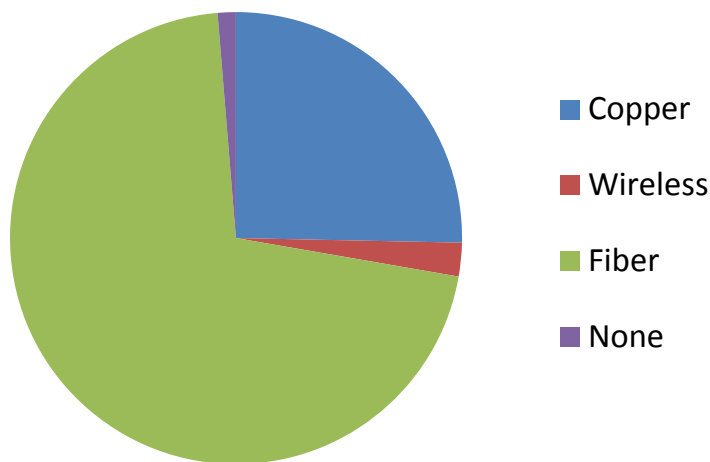


Chart 15

Schools with inferior backbones, insufficient wireless access points, and slower internal wiring will experience frustrating delays in their learning environments until these issues are addressed. The E-rate must focus funding on both big-pipe connections AND robust internal connections.

Costs

Rural schools are paying six times more for connections than other schools/school systems. Likewise, very large school districts (+50k students) spend over three times more for WAN than other schools/school systems.

The charts below show the story of broadband costs for different district types and the different component costs needed to deliver high capacity networks. Each chart depicts a set of funding problems that districts face. The costs for high capacity networks pose districts with unique challenges based on their locations, sizes, and needs. As a result, it is important to keep the funding program flexible and the local district as the decision maker. There is no “one size fits all” solution, as demonstrated by further examination of the cost figures.

Total Cost by Type of District

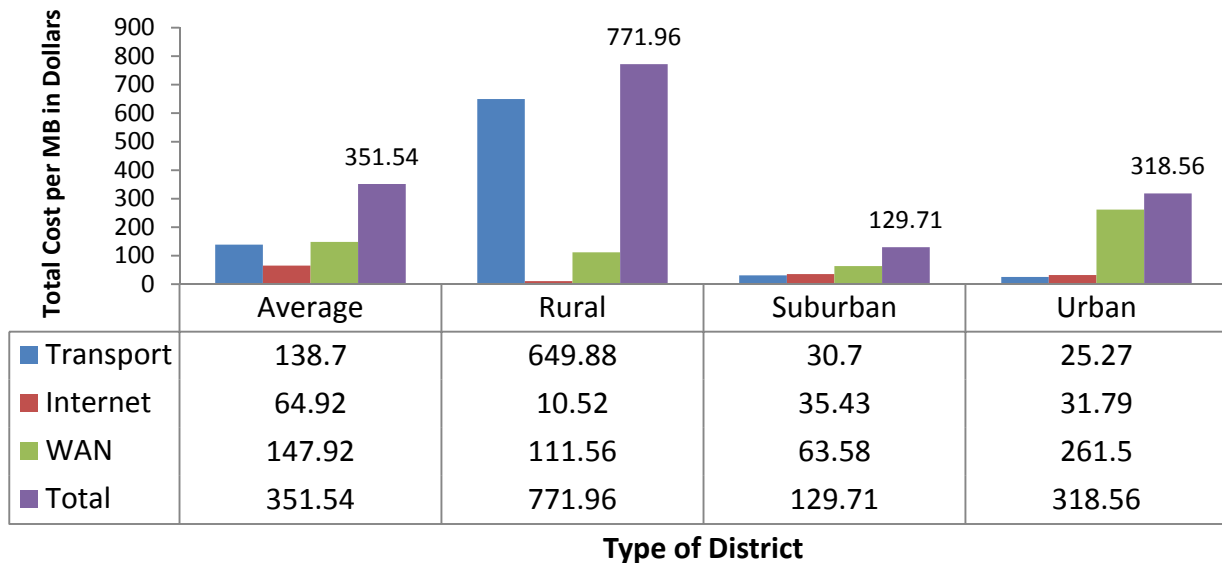


Chart 16

Charts 16 and 17 show the total cost for Transport, Internet, and WAN services. While even the average total cost seems high, if we break the number down in Chart 16 by rural, suburban, and urban, the data reveals that rural districts pay almost 2 times the average and almost 6 times as much as suburban districts.

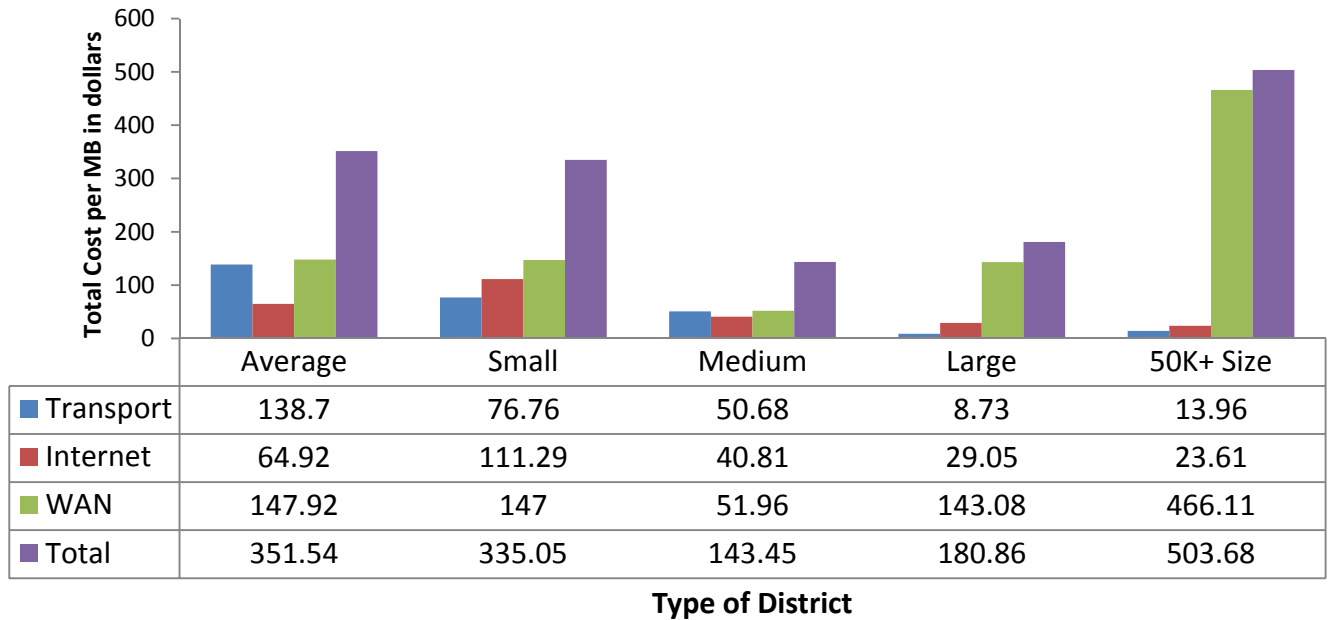


Chart 17

Chart 17, with districts broken down by size, shows another interesting and unexpected issue for very large (over 50,000 students) districts. In terms of total cost per Mbps, very large districts pay a cost significantly higher than average and more than 3 times that of medium sized districts.

Cost of District WAN Connection

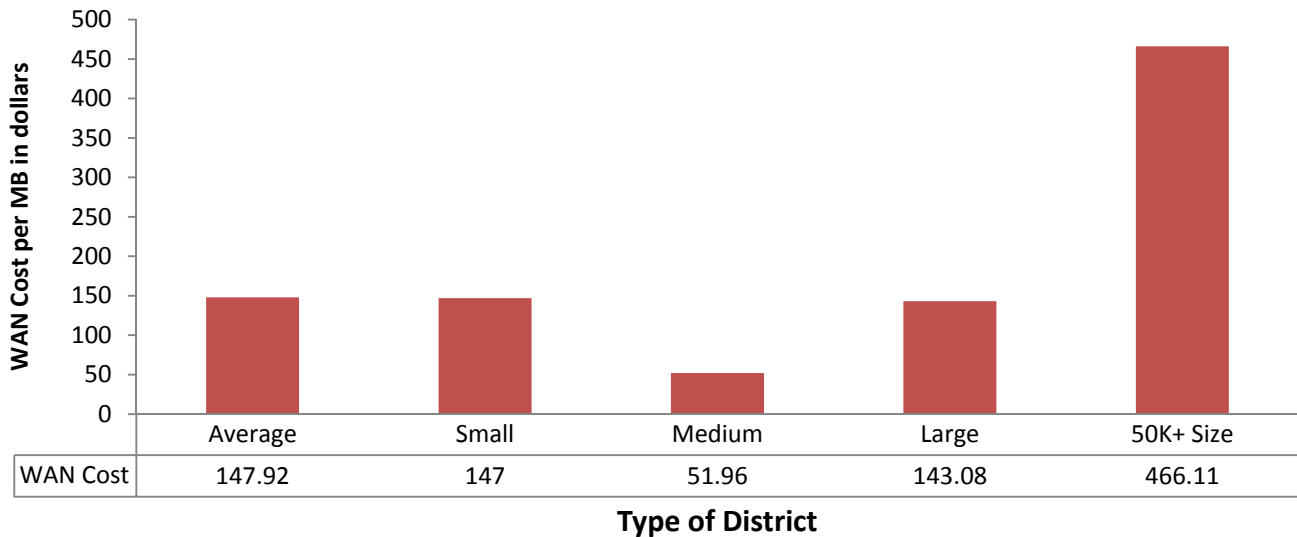


Chart 18

Differences in district type and size impact broadband costs. Chart 18 shows the costs for WAN connections broken down by size of district. The chart shows the disadvantage facing a 50K+ student population district: the cost of the connection to each school dramatically adds up. Even if the district has negotiated a very cost effective rate for bandwidth and transport, the cost to connect every school at the same speed can be very expensive. What the chart cannot show is that the individual rate may still be low, because the district is buying at the rate for 50 or 100 buildings, while a smaller district may only have 3-5 buildings.

Cost of Internet Bandwidth

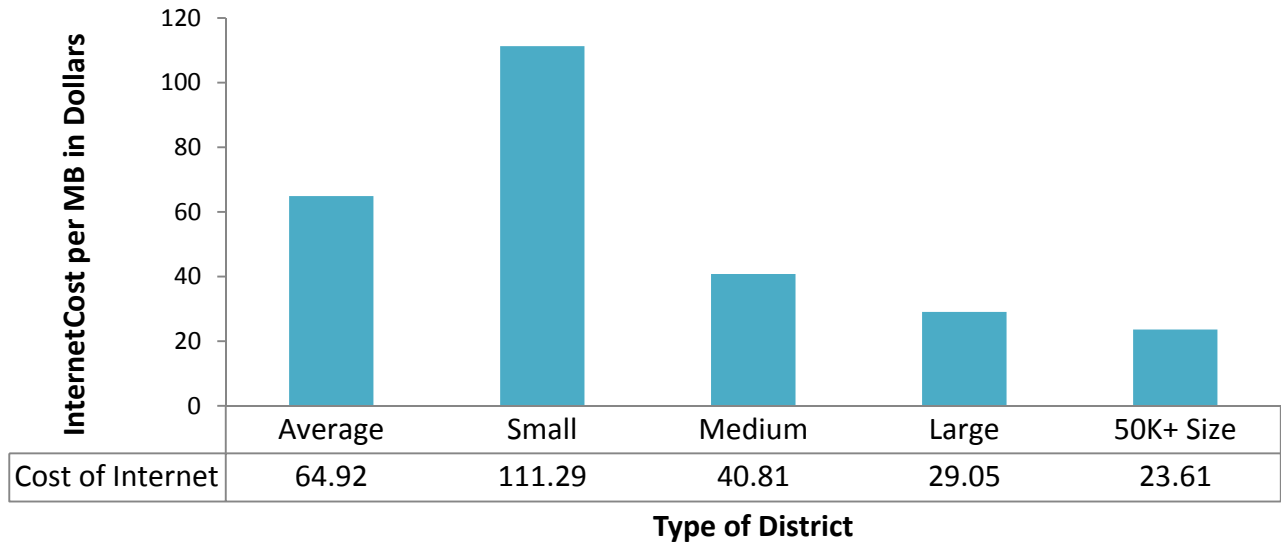


Chart 19

District size also impacts the cost of Internet Bandwidth, the bandwidth flowing through the connection (transport) pipe. Chart 19 shows that small districts pay almost twice as much as the average. Medium, large, and 50K+ districts all pay less.

Cost of Connection Pipe (Transport)

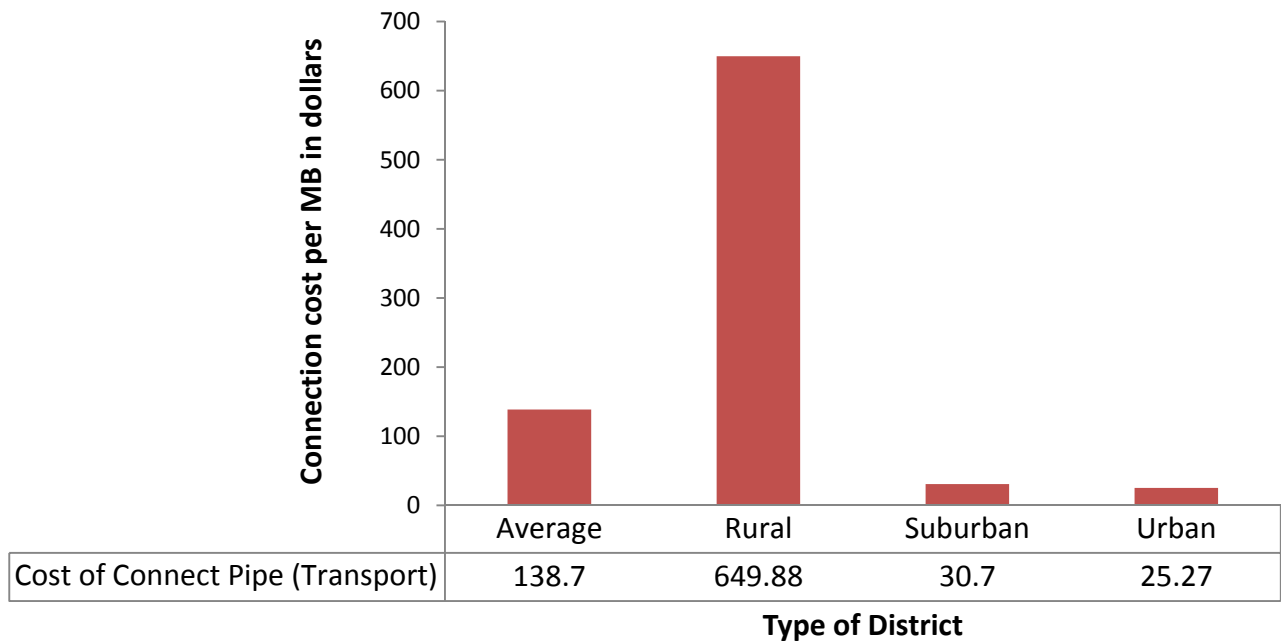


Chart 20

Chart 20 shows the cost for transport by type of district. Rural districts must transport over greater distances, often through multiple carriers and rugged and remote terrain. The communities where rural districts are

located are smaller, further hampering the chance to make a business case for a telco to invest in robust infrastructure upgrades. This increases the capital costs a district must bear for making the connection.

Telephony—POTS

President Obama, as part of his ConnectED⁸ initiative, has called for shifting E-rate priorities by funding next-generation broadband and high-speed wireless in schools and libraries. CoSN supports this change. That said, the survey also shows there is a need for a transitional funding period for Plain Old Telephone Service (POTS), since many districts still have these legacy systems and a large portion of districts receive E-Rate funding for them. The fiscal harm to districts could be great if basic telephone service were deemed a non-allowable expense under E-rate. In 2010 the FCC report⁹ indicated that 67% of E-rate Priority I telecommunications funding went to pay for land lines. This survey found that 28% of districts use 50% or more of their E-Rate funding on POTS discounts.

What percentage of your current E-rate funding goes to POTS (traditional telephone services)?

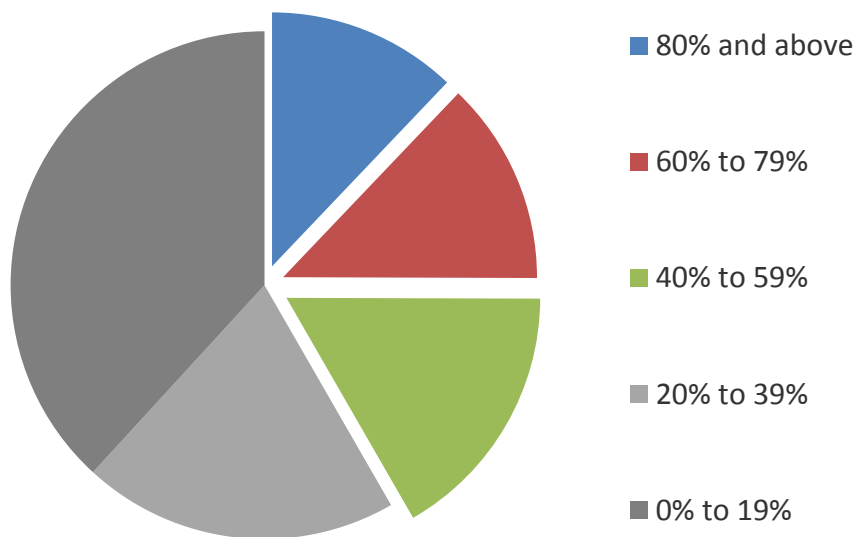


Chart 21

⁸ ConnectED: President Obama’s Plan for Connecting All Schools to the Digital Age (2013), http://www.whitehouse.gov/sites/default/files/docs/connected_fact_sheet.pdf

⁹ 2010 E-Rate Program and Broadband Usage Survey: Report, DA 10-2414, 26 FCC Rcd. 1, 2(2010), http://transition.fcc.gov/010511_Eratereport.pdf.

VOIP

Approximately one quarter of the districts have implemented Voice Over IP (VOIP) services and use E-rate funds to cover costs. An additional third of districts indicated they have a VOIP solution but are not using E-rate funds to pay for it, and 45.3% of districts have yet to implement any VOIP solution. Those non-VOIP districts are disproportionately small districts.

Have you implemented VOIP in your district?

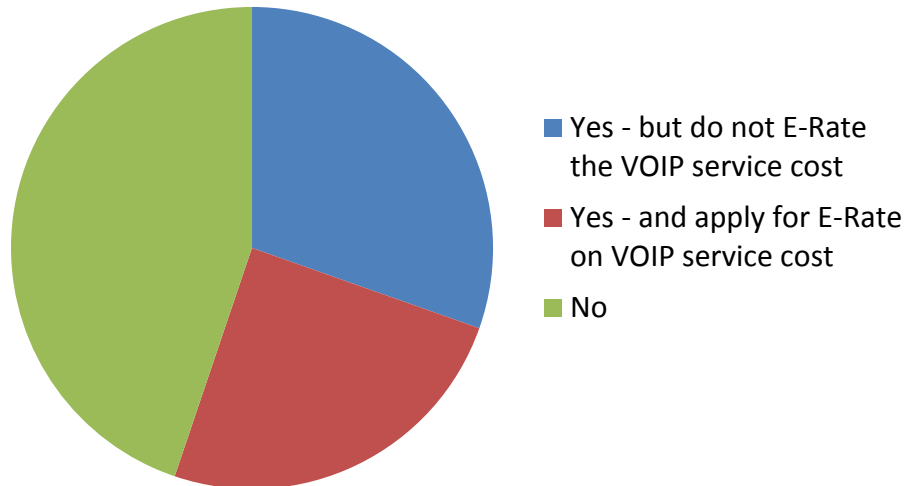


Chart 22

Further analysis of this question shows over 50% of smaller and rural schools have not yet implemented VOIP services.

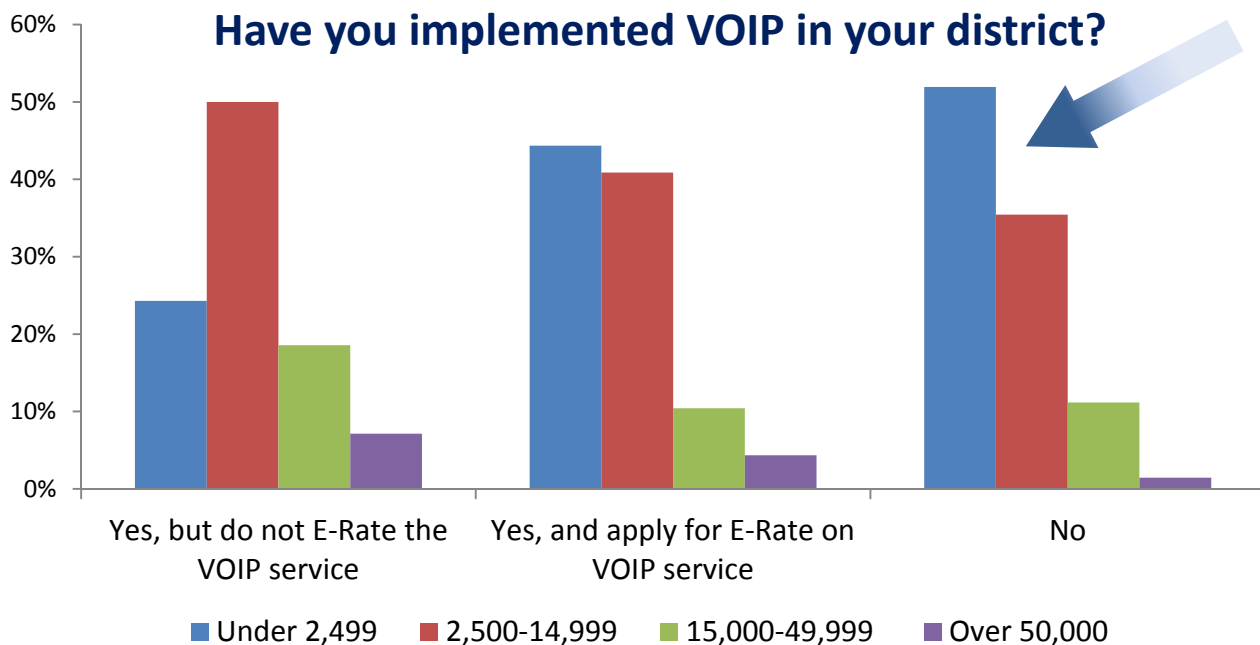


Chart 23

Have you Implemented VOIP in your District?

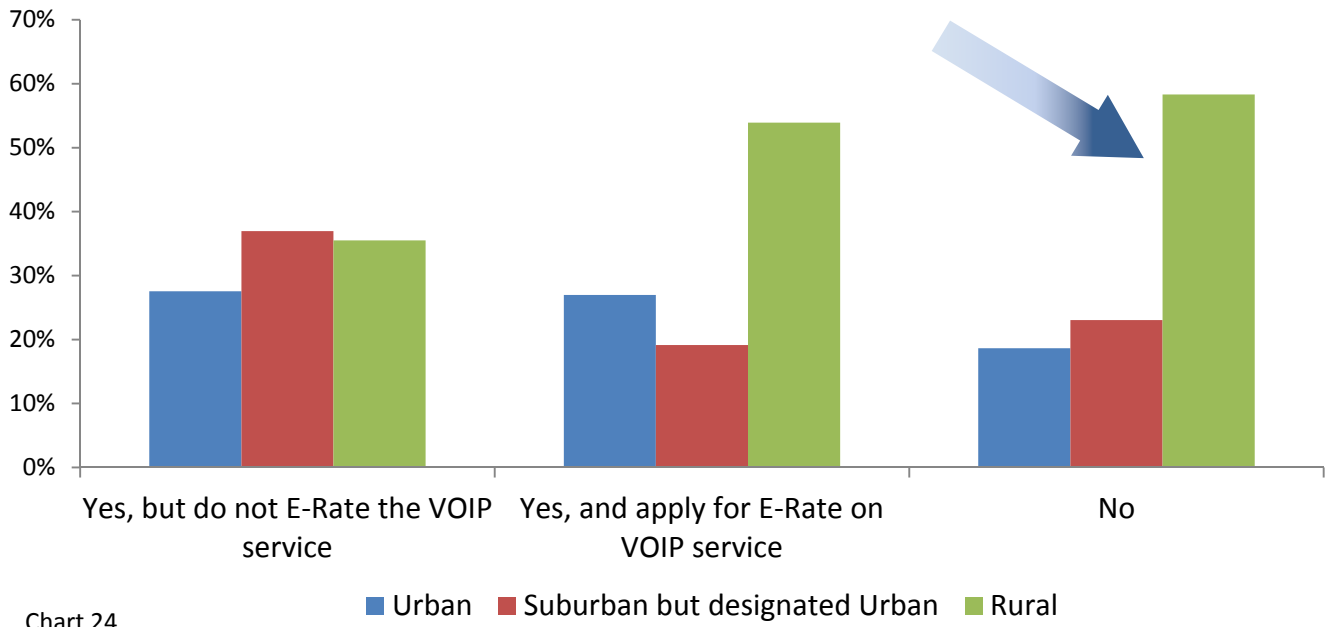
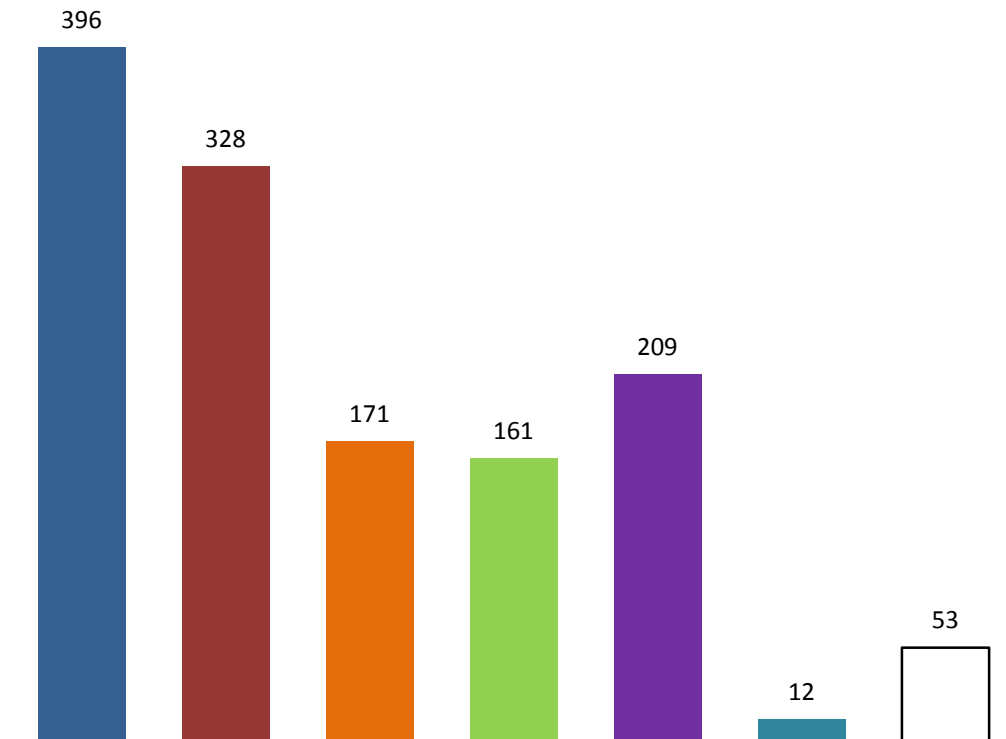


Chart 24

Providers

School districts use a variety of telecommunication providers—from traditional telcos and cable companies to statewide research and education networks and small independent providers.

Types of Providers – Which do you receive services from? *Mark all that apply.*



Traditional Wireline Telephone Company	396
Wireless/Cellular Company	328
Cable Company	171
State-Wide Education Network	161
Local Internet Provider	209
District Owned	12
Other	53

Chart 25

Consortiums

Some advocates have indicated that consortium buying, which aggregates demand is needed to drive down prices in the E-rate program. **Consortium buying, typically organized by an education service agency or state, is already used by nearly 44% of school districts (37% participate in consortium buying for bandwidth)** to achieve the best pricing possible. The largest group, 37% of the districts, is part of a consortium for Internet access, with some belonging to more than one buying group. That said, there is **significant room for expanding consortium buying** given the right incentives in the E-rate program.

Does your district participate in any consortium buying for E-rate services? Mark all that apply.

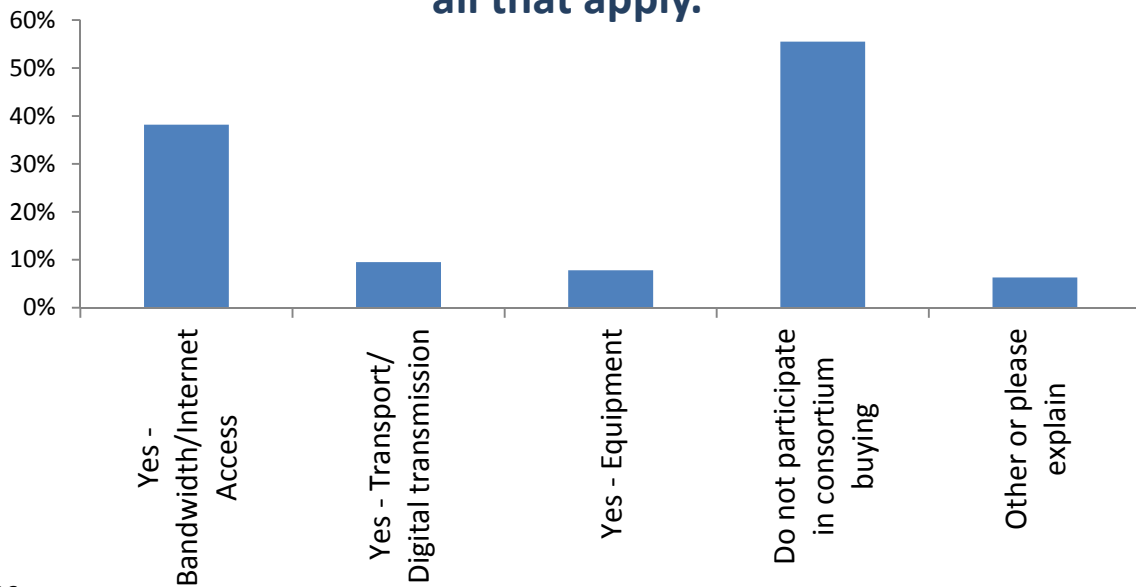


Chart 26

Findings and Recommendations

First and foremost, this survey highlights the **compelling need for increased E-rate funding**. The current cap on the E-rate is inhibiting the program from meeting districts' needs. 99% of districts agree they will need more broadband over the coming 36 months, placing even greater stress on an under-funded program.

The E-rate would have to double to upgrade internal connections, meet growing bandwidth needs and support transport connectivity. **A significant portion of school districts (43%) indicated that none of their schools can meet the goal of 100Mbps of internet access per 1,000 students today.**

The biggest barriers for districts in providing a robust network are cost-related: both ongoing, recurring expenses and up-front capital costs. While there has been much discussion about the need for a separate capital fund, it is also important to protect capital investments by funding ongoing maintenance costs.

The data also demonstrates that a one-size fits all per pupil formula for E-rate, although it may be appealing on the surface, would create many problems for addressing the needs of rural and large districts.

Districts currently lack bandwidth and sufficient internal connections – both wired and wireless – to meet their many needs for digital resources, online assessments, common core standards, and BYOD.

School systems are increasingly using consortia buying to lower bandwidth and network costs; however, incentives could be provided by the E-rate program to increase those trends.

Finally, increased E-rate investment for both capital and ongoing expenses is important; neither will be effective if viewed in the short term. As a country, we need to make a long-term commitment to ensuring that our classrooms are ready for learning today and tomorrow.

There is a strong and growing need to develop strategic, end-to-end school network designs that address internal infrastructure and broadband connections as equal steps in delivering a robust learning environment for students. CoSN, as the premier professional association of school district technology leaders/CIO/CTOs, is committed to providing this sort of vendor neutral advice.