

DIGITAL LEARNING IN CALIFORNIA'S K–12 SCHOOLS

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► **As California implements new tests in its K–12 schools, technology infrastructure is a key concern.**

California is implementing new tests (known as Smarter Balanced assessments) to complement the Common Core State Standards (CCSS). Since these new tests are delivered fully online, parents, researchers, and the general public have voiced concerns about the ability of schools' technology infrastructure to handle this large new task. In 2013–14, the legislature appropriated \$1.25 billion in CCSS implementation funds to help with teacher training, instructional materials, and technology upgrades. But many districts spent the money mostly on training and materials. In 2014–15, the governor included \$26.7 million in one-time funding specifically for broadband infrastructure improvement.

► **Many districts are confident that they had enough bandwidth for online field tests.**

In spring 2014, California administered online field tests in English language arts and mathematics to students in grades 3 through 8 and grade 11. Three quarters of the district administrators who participated in a 2014 California Educational Technology Professionals Association survey were either "fairly confident" or "certain" that their district had sufficient bandwidth for the field test. However, only 35% of districts responded and large and urban districts were overrepresented in the survey. The Smarter Balanced consortium surveyed test coordinators in 13 participating states. More than 70% of survey responders said their testing was successful—but, again, only a sample of test administrators responded. It is likely that the testing experience varied across districts and schools.

► **Digital learning will require significantly greater bandwidth than testing.**

The Obama administration has laid out an ambitious agenda for digital instruction that many states, including California, may soon adopt. But 39% of California's schools and 44% of its districts are connected at speeds lower than 100 megabits per second (Mbps), which is the White House's recommendation for digital learning. Without adequate bandwidth, schools are not likely to be able to provide video conferencing, virtual field trips, and personalized audio-visual learning.

► **Rural schools and districts are especially challenged.**

Only about a third of California's 403 rural districts have bandwidth at 100 Mbps or above, compared to about four out of five of the state's 181 urban districts. In fact, ten rural districts are still operating on T1 connections—part of a telephone-based digital system introduced in the 1960s. T1 is capable of delivering the assessment but cannot transfer data quickly.

► **Broadband costs significantly more in the smallest and largest schools, and all schools face ongoing costs.**

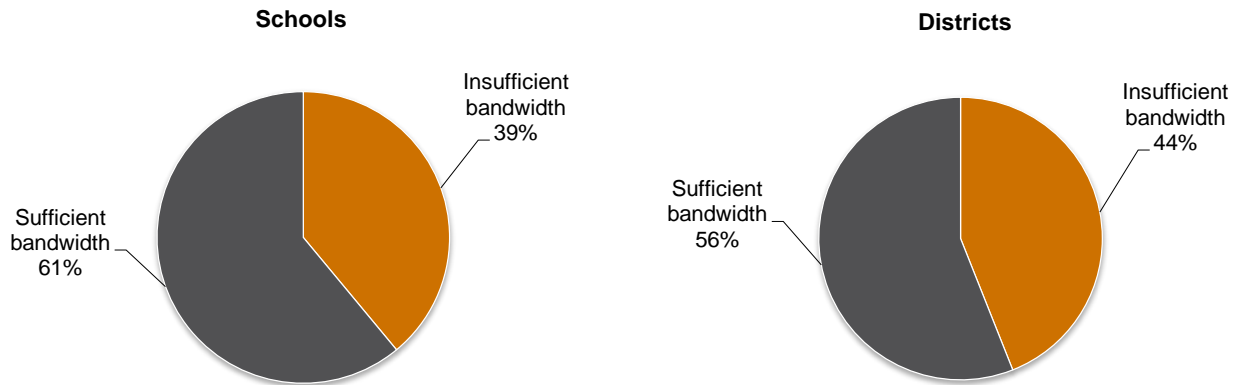
Up to a point, a network upgrade becomes more cost-effective for a larger number of students. Beyond that point, however, the trend reverses, so that an increase in enrollment slows down network traffic. In other words, the cost to upgrade technology infrastructure is significantly more expensive in very small and very large schools. Also at issue are the ongoing costs of maintaining and upgrading broadband systems.

► **Federal policies and programs might help California schools update their technological infrastructures.**

The federal E-rate program, which was created in 1996, provides eligible schools 20% to 90% discounts on telecommunication and Internet access. The Federal Communications Commission (FCC) and the White House recently announced plans to double the E-rate to \$2.4 billion. This funding has the potential to level the playing field for schools, particularly in rural communities. To monitor the development of technological infrastructure throughout the state, California needs to collect relevant data on hardware, network, software, and staffing.



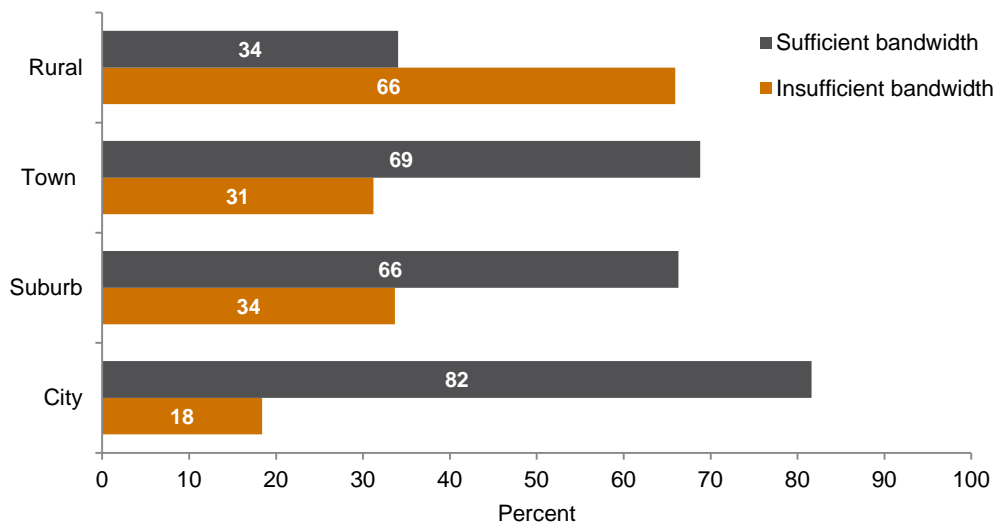
Large shares of schools and districts lack sufficient bandwidth for digital learning



Source: DataLINK, K-12 High-Speed Network (K12HSN), 2014.

Note: The White House proposed a minimum bandwidth of 100 Mbps (with a longer-term target of 1 Gbps) for digital learning. But, according to bandwidth data from DataLINK, 39 % of schools and 44 % of districts are connected at speeds below 100 Mbps.

Rural districts and schools are being left behind in the digital race



Sources: Bandwidth data: DataLINK, K-12 High-Speed Network (K12HSN), 2014. District urbanicity data: Common Core of Data, National Center for Education Statistics, 2011-12.

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