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How far is California from high-speed broadband Internet for all?

On August 14, 2020, California Governor Gavin Newsom issued an executive order directing state agencies "to pursue a minimum broadband speed goal of 100Mbps download speed to guide infrastructure investments and program implementation to benefit all Californians."[1] The order underscored how the COVID-19 pandemic has amplified our dependence on Internet connectivity for work, education, health and public safety, thus accelerating the urgency to address gaps in broadband deployment and adoption.

This policy brief examines how far California is from achieving this important goal. It identifies the characteristics of areas where broadband investments are most urgent, and discusses policy options to achieve the goals laid out in the executive order. The analysis is based on service availability data collected by the California Public Utilities Commission (CPUC), matched with demographic and adoption data from the Census Bureau's American Community Survey (ACS).[2]

High-speed broadband is available to most California residents, though gaps persist in rural and low-income areas

The vast majority of Californians (94.2%) live in census blocks where residential broadband services with advertised speeds of at least 100/10Mbps are offered.[3] As expected, high-speed broadband is significantly less likely to be available in nonurban areas.[4] Whereas about 98% of urban residents are within reach of 100/10Mbps services, this is true for only about two-thirds of nonurban residents. Even when accounting for differences in income, education and other demographic factors, these location-based differences remain significant, with 100/10Mbps service coverage in urban areas about 30 percentage points higher than in nonurban areas.[5]

Median household income is also a relevant determinant of high-speed broadband service availability. While 100/10Mbps services are available to over 98% of households in the top income decile, it is available to about 92% of households in the bottom income decile. This smaller than expected (but statistically significant) difference remains essentially unchanged when controlling for population density, education and other factors.

Similar patterns are observed in the case of fiber-service availability.[6] Overall, less than a third of Californians (31.5%) live in census blocks served by residential fiber, a modest increase from 29% in 2018. As expected, urban residents are about three times more likely to be served by fiber than nonurban residents. The deployment of fiber is also strongly correlated with wealth. Even after controlling for other demographic factors, fiber service availability is

[1] CA Executive Order 73-20, issued August 14, 2020.
[2] Both CPUC and ACS data correspond to December 2019, the most recent available.
[3] The executive order does not establish an upload speed target. Following industry standards, a 1:10 upload/download speed ratio is used.
[4] This study uses the Census Bureau's density criteria which defines urban areas as those with at least 1,000 residents per square mile.
[5] Based on regression model estimates available from author on request.
[6] These are fiber-to-the home (FTTH) or similar services capable of delivering gigabit-level speeds.

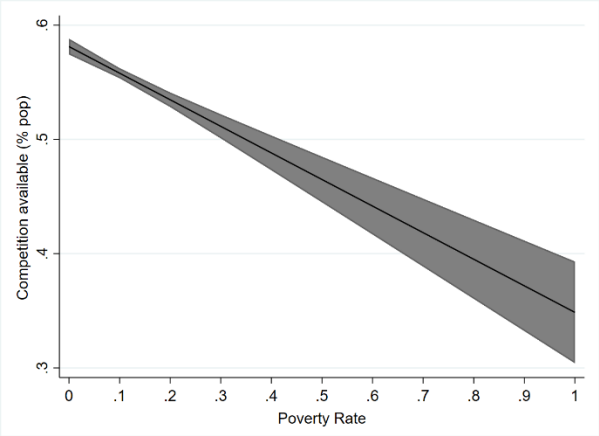
about 40% more likely for households in the top income decile relative to those in the bottom decile.

Differences in high-speed broadband availability exist, but weak competition and affordability are the most urgent problems

Despite these persistent differences in the availability of high-speed broadband along geographic and income lines, the evidence indicates that 100/10Mbps services are available to the vast majority of Californians. Even in low-income areas, over 9 out of 10 households are within reach of high-speed broadband. The most urgent and widespread problem is lack of competition in the provision of high-speed broadband. Statewide, only about 55% of the population lives in census blocks where competing 100/10Mbps services are offered. In other words, almost half of the state's households lack choice in the provision of high-speed residential broadband.

There are familiar patterns of where competition in high-speed broadband is found. Urban residents are four times more likely to live where competing 100/10Mbps services are offered (relative to comparable nonurban residents). Households in the top income decile are 32% more likely to be able to choose between high-speed broadband providers than those in the bottom income decile. Even after controlling for location, population density and other demographic factors, competition becomes less likely as poverty levels increase, as shown in Figure 1. This illustrates the urgent need to promote investments in broadband network infrastructure and services in low-income areas.[7]

Figure 1: Conditional estimate of population (%) served by two or more 100/10Mbps providers over poverty rate (95% confidence interval)



Competition is inextricably connected to service quality and prices. Without pressure from competitors, ISPs have few incentives to upgrade services and offer competitive prices.[8] This makes residential broadband unaffordable to many Californians, with less than half of households in the bottom income decile subscribing to services. A statewide survey conducted by the California Emerging Technologies Fund (CETF) in 2019 found that cost is the primary reason for not subscribing to residential broadband.[9]

Figure 2 maps the percentage of population in each California census block group that can choose between two or more providers of 100/10Mbps service. As shown, competition in high-speed broadband is essentially limited to the large metro areas in Southern California, the Bay Area and the Sacramento area. However, as shown in Figure 3, even within metro areas (such as Los Angeles) the extent of effective competition in high-speed broadband varies greatly, driven by income and other local market factors.

[7] For a more extensive discussion see Galperin, H., et al. (2019). *Who Gets Access to Fast Broadband? Evidence from Los Angeles County*. Presented at the 47th TPRC Conference, Washington DC.

[8] For a benchmarking study of broadband prices see "The Cost of Connectivity 2020" (New America Foundation, July 2020).

[9] CETF (2019). Internet Connectivity and the "Digital Divide" in California.

Figure 2: Population (%) served by two or more 100/10Mbps providers by census block group

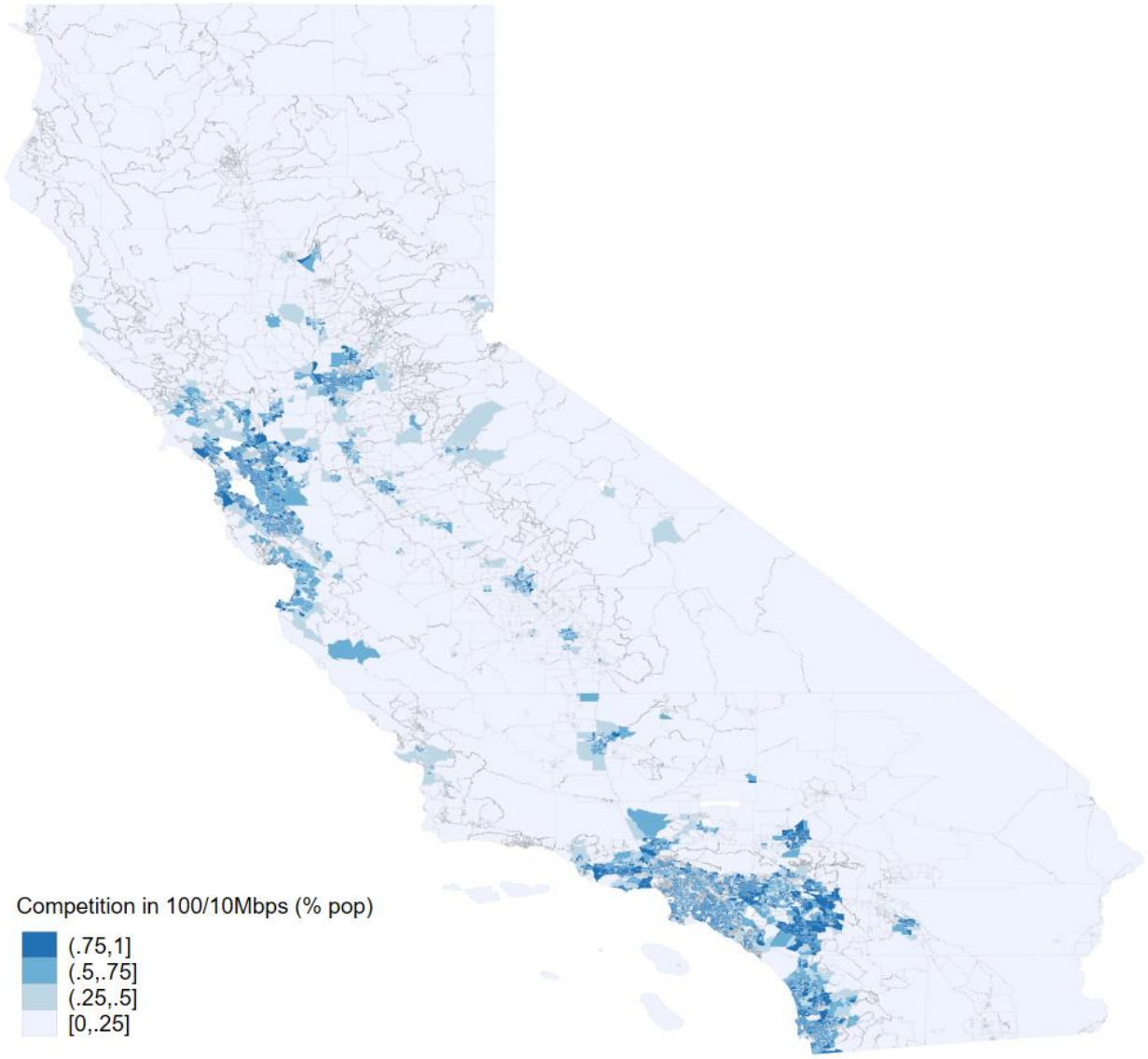
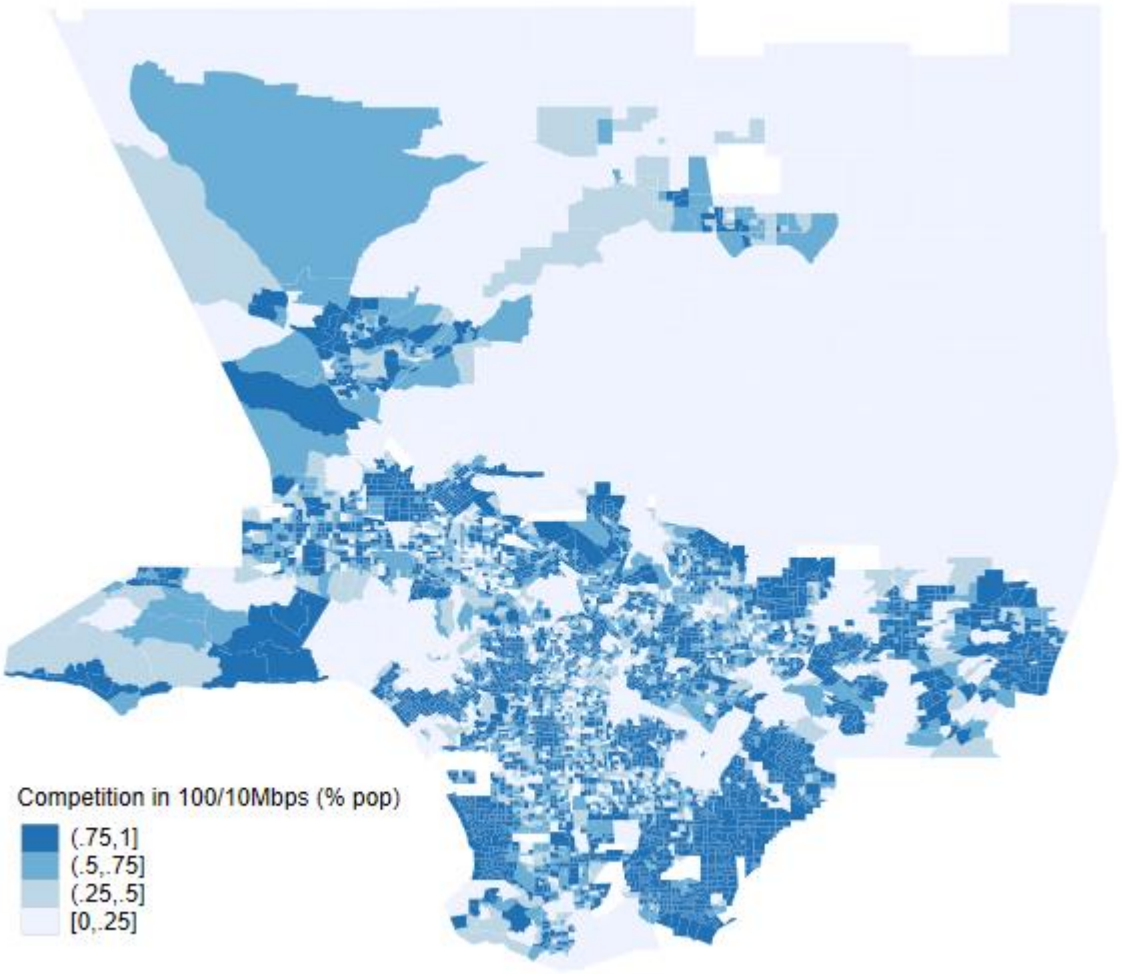
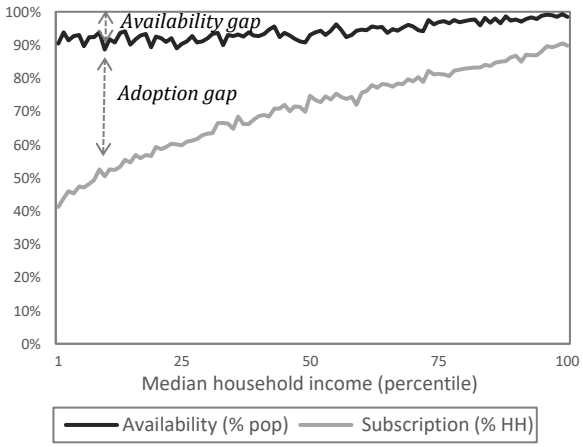


Figure 3: Population (%) served by two or more 100/10Mbps providers by census block group (Los Angeles County)



An approximation of the gap between broadband service availability and household subscription to services (the "adoption gap") is presented in Figure 3. As shown, deficits in 100/10Mbps availability are comparatively small relative to deficits in adoption, particularly as income decreases. It is worth noting that because the ACS subscription estimates include all residential wireline services (including for example legacy DSL services at lower speeds), the true adoption gap for 100/10Mbps service is likely higher.

Figure 3: Availability of 100/10Mbps service and residential wireline subscription rates by median household income (in percentiles)



Policy efforts to close the digital divide must prioritize competition and adoption

The COVID-19 pandemic has renewed the urgency to attend to disparities between those who have access to high-speed residential broadband and those who must either rely on slower and less reliable alternatives (such as smartphone wireless data plans) or are simply unconnected. Interestingly, the analysis indicates that California is closer than expected from the goal of making 100/10Mbps broadband universally available. At the same time, it lays bare the urgent need to spur competition and promote service affordability. For the approximately 11 million Californians who live in households without residential broadband, the problem is less one of availability than of weak competition, unaffordable prices and limited upgrades to legacy network infrastructure.

There are several proposals in the CA legislature to accelerate the deployment and adoption of high-speed broadband.[10] If approved, they would significantly expand the resources available through the California Advanced Services Fund (CASF), while also strengthening the role of local nonprofit organizations and governments in broadband infrastructure and service deployment. These represent important steps forward.

At the same time, the proposals continue to prioritize subsidies for infrastructure deployment in areas where high-speed services are unavailable. As discussed, these are disproportionately nonurban and scarcely populated areas which are also eligible for federal support.[11] Some proposals also exclude middle-mile projects from CASF funding, which may impact eligibility for municipal broadband initiatives. More broadly, the proposals fall short of what is needed to spur new market entry, promote equity in investments, and catalyze adoption in low-income communities. This includes, for example, the urgent need to revamp the California Lifeline program to include subsidies for standalone broadband.

Today there is a unique window of opportunity to enact legislation that helps connect Californians to high-speed broadband. While availability is not universal, the evidence suggests that the vast majority of the state's residents live in areas where 100/10Mbps services are currently being offered by at least one provider. Addressing the adoption gap and its root causes (weak competition and outdated subsidy mechanisms) should therefore take center stage in any proposal to promote high-speed broadband for all.

[10] Most notably SB-4 and AB-14.

[11] For example under the new, $20.4 billion Rural Digital Opportunity Fund (RDOF).

About the project

This document is part of the Connected Cities and Inclusive Growth (CCIG) project, a project of the USC Annenberg School for Communication. For more information visit arnicusc.org/research/connected-cities.

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