Affordable Connectivity Plan Enrollment and Digital Equity Planning

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Digital Beat

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Horrigan

If the federal government's investments in broadband connectivity are to be effective, different programmatic pieces must work together. Broadband infrastructure funds are necessary to ensuring universal access, but not sufficient to achieve full digital equity. Equitable broadband adoption depends on people having the financial means to maintain service, which the Affordable Connectivity Plan (ACP) facilitates, as well as access to wrap-around digital inclusion services (such as tech support and skills training). Effective coordination between infrastructure and digital equity investments can ensure that people subscribe to new networks that the Broadband Equity, Access, and Deployment (BEAD) program funds.

Examining ACP enrollment can help target resources to places with the most need

ACP enrollment data offers clues as to how well a community is positioned to take advantage of funds to promote digital equity. Abysmal ACP enrollment levels may indicate a capacity deficit; a community may have a dearth of institutions that can make people aware of ACP benefits and aid in enrollment. Strong ACP enrollment invites exploring why. Are particular places doing outreach that might explain high enrollment levels? If so, state policymakers would be wise to consult with digital inclusion advocates in these areas (as BEAD planning requires (https://broadbandusa.ntia.doc.gov/sites/default/files/2022-05/BEAD%20NOFO.pdf)) and explore whether initiatives in high-enrollment areas might be replicated elsewhere. Understanding the geography of ACP adoption can therefore help states more effectively prioritize resources for digital equity. If, for instance, Digital Equity Act (DEA) funds will provide grants to entities providing digital inclusion services in cities and communities, wouldn't it help to know which places have the greatest need? Patterns of ACP enrollment help answer that question.

There are three ways to think about ACP enrollment, which together can help policymakers and others understand digital inclusion needs in cities and communities.

1. Enrollment rates
2. Growth in enrollment
3. Enrollment performance in particular places

Enrollment Rates for the Affordable Connectivity Program

The federal government's subsidization program for home internet subscriptions is just over a year old – the amount of time the Emergency Broadband Benefit (EBB) and its successor program the Affordable Connectivity Plan (ACP) have been in operation. Since

EBB's inception in May 2021, some 11.3 million households have enrolled in either the EBB or ACP (through March of 2022). ACP's second year coincides with states beginning the planning process for using infrastructure and digital equity dollars that the National Telecommunications and Information Administration (NTIA) will distribute pursuant to Infrastructure Investment and Jobs Act funds.

Enrollment rates are a fairly straightforward calculation. ACP requires that applicants meet certain eligibility requirements, such as a household's income being at or below 200 percent of the federal poverty level. Knowing how many households in a city meet that criterion and how many have enrolled means it is possible to calculate the percent of eligible households that have signed up for the ACP benefit. Using 2016-2020 combined American Community Survey data on the share of households living at or below the 200 percent poverty level (roughly 37 million households total in the U.S.) and end-of-March enrollment date (11.3 million households) means 30% of eligible households have enrolled in ACP.[1] As the **table below** shows, this figure varies looking across different cities. Much – but not all – of this variation has to do with how many people live at or below the 200% poverty line in those cities.

TABLE 1

CITY	March ACP Enrollment	Eligible households	Enrollment as a share of eligible households	Total number of households[2]
Detroit	98,460	184,949	53%	362,963
Cleveland	93,146	185,565	50%	514,066
Baltimore	70,770	147,178	48%	466,473
Philadelphia	113,757	256,635	44%	613,186
Los Angeles (city)	156,348	354,290	44%	905,303
Columbus	71,145	176,508	40%	550,892
Indianapolis	55,419	141,623	39%	381,317
Atlanta	50,729	130,314	39%	433,273
New York	416,128	1,080,294	39%	3,245,280
Washington DC	43,633	114,044	38%	611,533
Las Vegas	85,205	224,631	38%	680,331
San Antonio	81,799	218,027	38%	603,133
Charlotte	38,323	104,544	37%	363,598
Miami-Dade	89,821	256,506	35%	701,289
Phoenix	66,489	195,548	34%	534,412
San Diego	53,041	159,787	33%	624,476
Jacksonville	41,606	126,061	33%	387,850
Chicago	129,692	396,147	33%	1,164,657
Tucson	42,669	134,074	32%	366,557
San Francisco	23,399	74,401	31%	362,141
Dallas	62,168	210,378	30%	551,241
Fort Worth	38,290	136,532	28%	424,612
Portland	28,277	103,147	27%	422,778
Seattle	24,324	89,205	27%	448,151
Denver	52,127	200,188	26%	960,769
Boston	37,819	151,673	25%	565,187
Minneapolis	26,675	112,432	24%	450,804
Houston	95,708	449,632	21%	1,152,020
Austin	18,843	113,862	17%	450,246
Nashville-Davidson	16,189	98,116	16%	363,404
ALL	2,221,999	6,326,288	35%	19,661,942

Detroit's high enrollment rate tracks with its large share (51%) of households living at or below the 200% poverty threshold. Cleveland has a 50% enrollment rate, but 36% of households there have incomes at or below the 200% poverty threshold. At the other end of the spectrum, Austin's and Nashville's low enrollment rates unfold in places where fewer households live at or below the 200% poverty line (25% and 27%, respectively).

Across these four cities, Detroit seems to be performing as expected, while Cleveland is a bit better-than-expected; Austin and Nashville are behind the curve. These figures tell us something about performance, but not a lot about what might be behind it or *where* in a given city it may be better or worse. Looking at performance permits a more precise understanding of why ACP enrollment rates vary in different places.

Performance

Understanding ACP enrollment performance is a more nuanced topic even if the question is clear: Do some places do a better job at signing up households to ACP than others? To answer that requires disentangling *actual* enrollment from *predicted* enrollment. That, in turn, requires a statistical model that predicts how many households enroll in ACP.[3] Such a model uses a number of a place's characteristics (racial/ethnic make-up, the age of the population, levels of educational attainment, existing patterns of technology adoption, and income[4]) to predict how many households should enroll in ACP. That prediction may vary from the actual number of enrollees. If more households in a particular area have signed up for ACP than the model predicts, then that area is a high performer with respect to ACP enrollment.

In Baltimore, for instance, the model shows that the Broadway East and Johnston Square neighborhoods (in the 21202 and 21213 zip codes, respectively) have enrolled about 25% more households in ACP than predicted. Both zip codes have high rates of ACP enrollment, but nonetheless Broadway East has signed up some 25% more households than predicted. Why? In Baltimore, ReBUILD Metro (https://www.baltimoresun.com/maryland/baltimore-city/bs-md-kelly-build-20220319-k7wcyaf6ifclbnjio54mzdkoxa-story.html) is a local coalition that has aimed to improve the housing stock in Broadway East and integrate internet access into trying to improve the lives of residents. The initiative tries to leverage the presence of nearby anchor institutions – Johns Hopkins Hospital and a public library branch – in its work. This suggests that investments in social infrastructure may matter.

Another possible difference-maker is the public library. The statistical model shows a correlation between the presence of public libraries in a 5-digit zip code and ACP enrollment. The “library effect” is associated with 6% higher ACP enrollment in 5-digit zip codes with a public library compared to those without.

None of this demonstrates causation. Places with public libraries may have other characteristics that lend themselves to ACP uptake, although it is also true that many public libraries have sought to publicize the ACP program. From a planner’s perspective, however, causation may not be important. Knowing where ACP performance is strong (for whatever the reason) can spark a search for models that hold promise. If such models are found, these promising practices can be adapted to other places that may be underperforming. Findings from performance-based analysis of ACP enrollment can offer more targeted allocation of DEA funds, thereby helping to increase the chance that they pay off.

Comparing performance to enrollment rate shows several consistencies in outcomes across cities, but a number of cases where there is a disconnect between enrollment rate and performance. The high enrollment rates in Detroit and Cleveland track with high-performance indicators. Portland and Denver are two places where enrollment rates trail the average in cities sampled (and the nation at large) but whose performance is above expectations. Yet some cities—such as Jacksonville, Chicago, and Dallas—have ACP enrollment rates that do not differ greatly from the norm, but their performance is significantly below par. On the other side of the coin, there are cities whose enrollment rates are near the average (San Antonio, San Diego, Tucson, and Miami-Dade) but whose performance metrics are very good. Finally, there are a group of cities – Boston, Austin, Minneapolis, Houston, and Nashville – with below-average enrollment and poor performance.

TABLE 2

	ACP Enrollment, March 2022	ACP Predicted Enrollment	Percentage Difference	Total Number of Households
San Antonio	81,655	61,322	25%	603,133
Cleveland	93,146	71,417	23%	514,066
Miami-Dade	89,821	69,545	23%	701,289
Tucson	42,669	34,495	19%	366,557
Los Angeles (city)	156,348	128,720	18%	905,303
Columbus	71,145	60,630	15%	550,892
San Diego	53,041	45,231	15%	624,476
Detroit	98,460	85,800	13%	362,963
Denver	52,127	45,736	12%	960,769
Portland	28,277	25,194	11%	422,778
Phoenix	66,489	59,567	10%	534,412
Indianapolis	55,419	51,412	7%	381,317
Baltimore	70,771	66,192	6%	466,473
Las Vegas	85,207	79,783	6%	680,331
Philadelphia	113,757	107,315	6%	613,186
Atlanta	50,732	49,904	2%	433,273

Washington	43,634	43,651	0%	611,533
New York	416,128	423,561	-2%	3,245,280
Seattle	24,324	24,766	-2%	448,151
Charlotte	38,323	40,619	-6%	363,598
Jacksonville	41,606	45,943	-10%	387,850
Chicago	129,275	145,035	-12%	1,164,657
Dallas	62,168	70,586	-14%	551,241
San Francisco	23,399	26,844	-15%	362,141
Fort Worth	38,290	45,325	-18%	424,612
Minneapolis	26,675	34,828	-31%	450,804
Boston	37,819	51,252	-36%	565,187
Austin	18,843	28,278	-50%	450,246
Houston	95,708	160,808	-68%	1,152,020
Nashville-Davidson	16,190	31,104	-92%	363,404
ALL	2,221,446	2,214,863	0%	19,661,942

What are the sources of performance variation? As noted, the presence of a public library has a positive, if modest, association with performance. But there are other drivers, each of which digital equity planners should note:

- African American households are more likely to have enrolled in ACP (even when accounting for income, age, and educational attainment levels).
- Hispanic and White households are significantly less likely to have enrolled in ACP.
- Rural households are less likely to have signed up for ACP.[5]

A goal of Infrastructure Investment and Jobs Act broadband investments is to improve digital equity. The findings of inequity in these categories suggest which groups warrant special attention and, importantly, where they are. Note that San Antonio and Miami – areas with a high share of Hispanic households – fell into the category with average enrollment rates but high performance. Given the negative association between the share of Hispanics in an area and ACP uptake, it seems like something in the digital inclusion environment there has overcome the downward pressure the Hispanic variable has on ACP enrollment.

Growth

A final metric to consider is growth. Stakeholders in some cities who might be disappointed by their enrollment rates can potentially take heart if growth in ACP enrollment is strong. A simple comparison of EBB enrollment at the end of 2021 (when approximately 9 million households nationally had enrolled in the program) and March 2022 is helpful. During that time period, there was a 23% increase in enrollment in the federal government's connectivity subsidy program. As **table 2** shows, growth rates varied in the top 30 cities.

Looking at December to March growth does offer comfort to cities with low enrollment rates and poor performance metrics, such as Boston, Nashville, Austin, and Minneapolis. The strong growth rates for Miami, Los Angeles, and (to a lesser extent) San Antonio accompany strong enrollment and performance findings for those cities. In light of the fact that places with high shares of Hispanic households are generally less likely to enroll in ACP, the findings are striking. It is worth exploring if there were specific strategies to reach Hispanic households in those cities. Another takeaway from this table (in combination with Tables 1 and 2) is that the phrase "Houston, we've got a problem" clearly applies when it comes to ACP enrollment for that city.

TABLE 3

CITY	EBB, December 2021	ACP, March 2022	Difference	Percent growth	Total Households
Miami-Dade	62,912	89,821	26,909	43%	701,289
Boston	28,045	37,819	9,774	35%	565,187
Portland	21,365	28,277	6,912	32%	422,778
Washington DC	33,261	43,633	10,372	31%	611,533
Nashville-Davidson	12,491	16,189	3,698	30%	363,404
Austin	14,764	18,843	4,079	28%	450,246
Minneapolis	21,138	26,675	5,537	26%	450,804
Atlanta	40,208	50,729	10,521	26%	433,273
Fort Worth	30,444	38,290	7,846	26%	424,612
Los Angeles (city)	124,407	156,348	31,941	26%	905,303

Denver	41,591	52,127	10,536	25%	960,769
San Antonio	65,616	81,799	16,183	25%	603,133
New York	334,977	416,128	81,151	24%	3,245,280
Chicago	104,649	129,692	25,043	24%	1,164,657
San Francisco	18,994	23,399	4,405	23%	362,141
Dallas	50,928	62,168	11,240	22%	551,241
San Diego	43,529	53,041	9,512	22%	624,476
Philadelphia	93,805	113,757	19,952	21%	613,186
Jacksonville	34,327	41,606	7,279	21%	387,850
Columbus	59,428	71,145	11,717	20%	550,892
Phoenix	55,805	66,489	10,684	19%	534,412
Detroit	82,778	98,460	15,682	19%	362,963
Seattle	20,529	24,324	3,795	18%	448,151
Charlotte	32,396	38,323	5,927	18%	363,598
Baltimore	59,931	70,770	10,839	18%	466,473
Las Vegas	72,809	85,205	12,396	17%	680,331
Indianapolis	47,524	55,419	7,895	17%	381,317
Cleveland	80,157	93,146	12,989	16%	514,066
Houston	83,483	95,708	12,225	15%	1,152,020
Tucson	38,297	42,669	4,372	11%	366,557
ALL	1,810,588	2,221,999	411,411	23%	19,661,942

A final point about looking at growth rate is how cities that seemed to do well with EBB enrollment (https://www.benton.org/blog/emergency-broadband-benefit-has-thus-far-enrolled-just-1-12-eligible-households-places-low) in its early months – such as Detroit, Baltimore, and Cleveland – experienced below-average ACP growth between December 2021 and March 2022.

What does this mean for planners?

Perhaps nothing could be a more frustrating outcome from BEAD network investments than a persisting gap between deployment and subscription. Understanding where there are ACP enrollment shortfalls can help address this “if you build it, will they log on?” (https://dailyyonder.com/if-its-built-will-americans-log/2009/01/23/) concern. Looking at the performance of ACP uptake at a granular level can help avoid “networks to nowhere” for state broadband planners:

1. Examining ACP enrollment in 5-digit zip codes can help target resources to places with the most need, e.g., places within cities where, for whatever reason, households are unaware of ACP.
2. ACP enrollment can serve as a proxy for local capacity to foster digital inclusion. Understanding where enrollment is over-performing can launch productive inquiry into models that may be effective – and replicable.
3. Findings on ACP enrollment can help structure community outreach initiatives that BEAD requires. Although focusing on promising practices for digital inclusion in areas with high ACP enrollment is an attractive avenue, community outreach in low-performing ACP areas has merit.

The National Telecommunications and Information Administration has emphasized that a key goal of BEAD investments is digital equity. State planners will need all the tools they can find to work toward that goal – and analysis of ACP performance is one such tool.

John B. Horrigan (https://www.benton.org/benton-experts/john-horrigan) is a Benton Senior Fellow. He is a national expert on technology adoption, digital inclusion, and evaluating the outcomes and impacts of programs designed to promote communications technology adoption and use. Horrigan served at the Federal Communications Commission as a member of the leadership team for the development of the National Broadband Plan. Additionally, as an Associate Director for Research at the Pew Research Center, he focused on libraries and their impact on communities, as well as technology adoption patterns and open government data.

Notes

[1] This is likely an underestimate of eligibility, since some households may have multiple eligible people (e.g., when more than one

family shares a house or apartment).
[2] The number of households listed for cities comes from consulting a zip code database (https://www.zip-codes.com/) that identifies zip codes associated with a city. Those boundaries do not usually align with a city's legal boundaries, meaning the figures for this column vary from totals found in the U.S. Census.
[3] The results on ACP performance are based on an ordinary least squares regression analysis that regress ACP enrollment per household at the 5-digit zip code unit of analysis on the variables noted above. The data comes from the American Community Survey (2016-2020 5-year data), the Public Library Survey from the Institute for Museum and Library Services, and the University of Michigan's Population Studies Center which has developed a scale (https://www.psc.isr.umich.edu/dis/data/kb/answer/1102.html) of "ruralness" at the 5 digit zip code level.
[4] The model does not include network availability or quality, as there is not reliable data on this at the 5-digit zip code level.
[5] The University of Michigan has devised a scale of whether a zip code is more or less rural, and that is used to derive this finding

Kevin Taglang
Executive Editor, Communications-related Headlines
Benton Institute
for Broadband & Society
1041 Ridge Rd, Unit 214
Wilmette, IL 60091
847-328-3040
headlines AT benton DOT org

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Broadband Delivers Opportunities and Strengthens Communities

By John Horrigan.

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CONTACT

Benton Institute
for Broadband & Society
1041 Ridge Rd, Unit 214
Wilmette, IL 60091

847-328-3040
Contact Us (/contact-us)
