

The
**AFFORDABLE
CONNECTIVITY
PROGRAM**
CREATES
BENEFITS
THAT FAR
OUTWEIGH
the PROGRAM'S
COSTS

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INTRODUCTION

The Affordable Connectivity Program (ACP) raises new questions about the economic impact of broadband. Does the internet access that ACP subsidy makes possible create financial benefits for subscribers that might not otherwise happen? And do those benefits outweigh the program's cost?

The ACP offers a \$30-per-month discount on internet service plans for low-income households who meet specific eligibility criteria.¹ The pandemic showed not only that many households lacked home internet subscriptions but also that economic disruption causes some low-income households to lose service as their budgets tighten. Among those without service or subject to disconnection, surveys showed that sizable numbers of lower-income households express worries about the affordability of service.² The Federal Communications Commission (FCC) established the program in 2021 with the primary goal of reducing the digital divide for low-income consumers.³ In a short time, the program (including its predecessor the Emergency Broadband Benefit, or EBB, program) has provided more than \$17 billion in subsidies for 23.3 million households. Despite numerous calls and efforts to extend it, the program is currently set to expire on May 30, 2024.

In this brief, we analyze the economic impact of this program through the lens of financial benefits for subscribers. Does the ACP subsidy create financial benefits for subscribers that might not otherwise happen? Do the benefits outweigh the program's cost?

Addressing these questions means understanding two things:

- Establishing how ACP impacts the levels and consistency of home broadband subscriptions for low-income households.
- Specifying the likely benefits for low-income households that take advantage of this connectivity.

The analysis that follows uses existing data on ACP enrollment patterns, as well as research on the impact of broadband adoption on households' economic prospects, to develop a benefit-cost assessment of the ACP.

This exploration finds that every dollar of ACP subsidy returns nearly two dollars in impacts to those using the program. These benefits fall into two categories: employment effects that boost household income; and convenience effects, e.g., time saved from shopping online as well as having access to a greater variety (or quality) of goods.

With the ACP's future very much in doubt, this analysis underscores how the program is much more than a fix for the digital divide. By getting more people online and offering more consistent connectivity for low-income households, the ACP allows the internet to open doors to economic advancement and social inclusion for people with low socioeconomic status. In that way, the ACP helps advance the promise of universal service, namely, that there is a public good to having all citizens connected to information and communications networks.

I. QUANTIFYING CONSISTENT CONNECTIVITY

By the beginning of February 2024, some 18 percent of U.S. households had enrolled in ACP. Much of the following analysis focuses on the enrollees who opted to apply the benefit to wireline service, which make up 44.3 percent of all ACP beneficiaries, or about 10.3 million households. For this analysis, ACP households fall into one of three categories:

- 1. THE NEWLY CONNECTED:** American Community Survey (ACS) data from 2022, the latest available, showed that nearly one-quarter of all U.S. households did not have wireline high-speed internet subscriptions at home. For households whose annual incomes fall below \$25,000, more than 40 percent lacked a wireline subscription as of 2022. It is not clear precisely the degree to which that number has changed due to ACP, but estimating that figure is a key part of the analysis to follow.
- 2. RETURNING USERS:** Many low-income households have at one time had their internet subscription lapse. Estimating just how many low-income households are likely to cycle on and off home connectivity in a given year is a crucial step in determining the overall benefit of the program.
- 3. USERS FOCUSED ON COST RELIEF:** Some internet subscribers enrolled in ACP to sustain service that, in all likelihood, they have had reasonably consistently. They may worry about affordability (as nearly half of connected low-income households do, according to a 2021 survey)⁴ and welcome the \$30-per-month ACP discount as offering breathing room in their budgets.

Categorizing wireline ACP beneficiaries will help quantify the benefits the program brings to each group, which we estimate in the following section. We first estimate the number of ACP subscribers in the above categories.

THE NEWLY CONNECTED: How many new broadband subscribers did ACP create?

The answer to this question has taken on a great deal of importance among policymakers who believe the ACP's goal should be to close the digital divide. Some analysts have argued that the measure of the program's success is only the share of beneficiaries who did not have a broadband subscription before. This perspective misapprehends the dynamics of broadband adoption in two ways:

- Lots of low-income households periodically suffer from service disconnection. Up to one-third of low-income households, at a given time, may have service but did not a few months ago. A subsidy such as ACP could greatly lessen the likelihood of occasional lapses in home service.

- The time horizon to assess pandemic-era changes in broadband adoption for low-income households (and ACP’s role) should predate the 2022 start of ACP. ACP has been part of a “gain and sustain” dynamic for lower-income households, whereby gains in broadband adoption grew sharply from 2019 to 2021, as pandemic relief efforts contributed to getting more people online.⁵ The ACP has helped lock in the gains in broadband adoption that occurred from 2019 to 2021 while contributing to modest broadband adoption gains in 2022.

Thus, consistent with the program’s goals, success for ACP should be measured by how well it mitigates subscription lapses for low-income households and sustains broadband adoption increases that occurred due to initiatives spurred by the pandemic (e.g., COVID-relief stimulus checks and the Emergency Broadband Benefit).

At the same time, understanding how ACP contributes to broadband adoption that might not otherwise occur is important, because it matters in calculating the program’s benefits. Here is what we know about the ACP’s likely impact on broadband adoption:

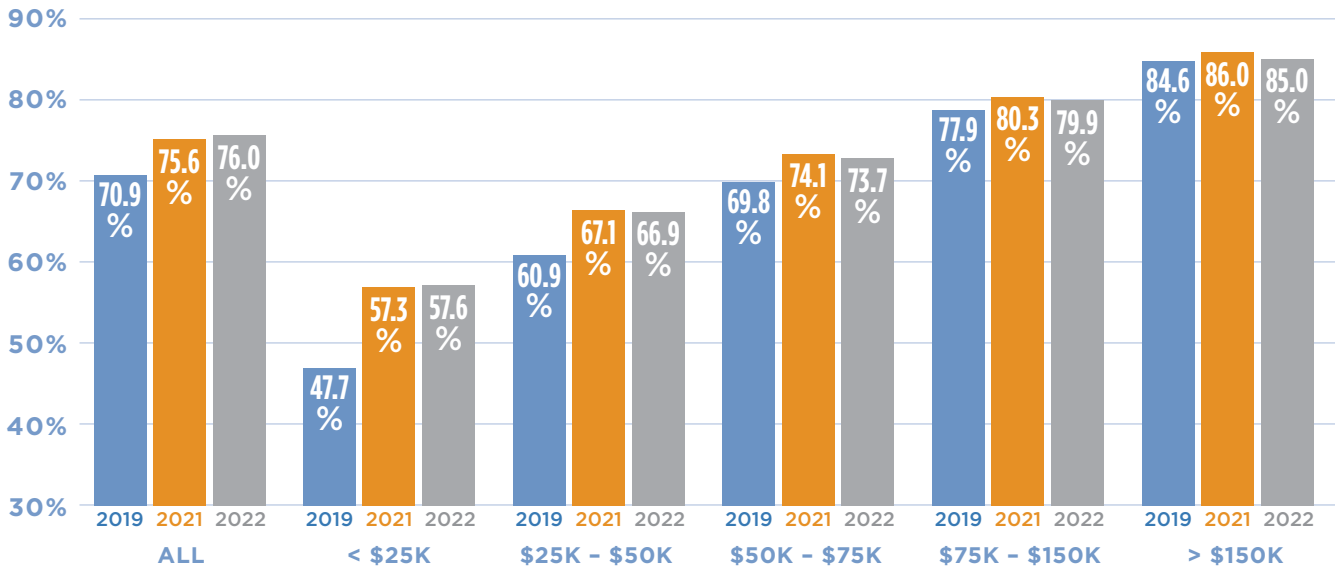
Survey data of ACP enrollees: Different surveys have characterized the “new subscriber” figure at between 20 percent and 24 percent; that is, when asked, around one in five ACP enrollees say they did not have wireline broadband before ACP.⁶ A recent Federal Communications Commission (FCC) survey finds that 22 percent of ACP subscribers had no internet service prior to enrolling.⁷ It is possible—even likely—that some of these affirmative responses are households that had home service at some point in the past.

Other data analysis: A close examination of ACS and carrier data suggests that, from 2021 to 2022 (which coincides with ACP’s inception), there has been very little gain in overall wireline broadband subscribership. Given meager overall broadband adoption increases, one might think that ACP’s net impact on broadband subscribership must be small. As articulated by New Street Research, the more relevant question may be what happened not in 2022, but prior to that. New Street’s analysis indicates that a surge in broadband adoption for wireline carriers coincided with pandemic relief in 2020.⁸

Analysis of ACS data confirms the pattern New Street identifies—a surge in broadband subscription at the pandemic’s outset followed by a plateau. Looking at wireline and cellular data adoption by income category in ACS one-year estimates for 2019, 2021, and 2022, low-income households gained significantly from 2019 to 2021, with little change from 2021 to 2022.⁹

HOME WIRELINE BROADBAND ADOPTION

AMERICAN COMMUNITY SURVEY 1-YEAR ESTIMATES



The data shows a strong growth in wireline adoption for the lowest income category—the increase from 47.7 percent of households with wireline subscriptions at home to 57.3 percent in one year is a 20 percent increase. That figure is congruent with what the different survey results for ACP populations find (as noted above). It is hard to escape the fact that pandemic-era initiatives (such as stimulus checks, the EBB, private-sector marketing initiatives, and philanthropic efforts) were responsible for getting a large number of low-income households online. The ACP not only sustained this, but helped low-income households weather a 2022 that saw a growth in inflation, the end of the child tax credit, and other economic headwinds. It is worth noting that the data only takes us through 2022 and it is likely that 2023 ACP sign-ups included significant numbers of wireline customers.

RETURNING USERS: How many more *consistent* broadband subscribers did ACP create?

A number of survey data points suggest that 30 percent is a credible estimate of low-income households that have suffered from service disconnection at some point.

- Surveys conducted during the pandemic showed that 29 percent of internet users with annual incomes below \$30,000 (or nearly 5 million households) lost service due to the economic challenges the pandemic imposed upon them.¹⁰
- That survey looked not just at those who lost service but also at the past subscription patterns of those currently lacking service. Some 31 percent of those without a home wireline subscription had had service in the past.¹¹

- Another view of the comings-and-goings of connectivity comes via data from surveys that ask people without service if they had had a home subscription previously. The National Telecommunications and Information Administration’s (NTIA) 2021 Internet Use surveys found that [23.5 percent of households](#) without internet subscriptions had household members who had previously been home internet users.
- If 30 percent of wireline ACP enrollees restore service they once had, this comes to about 2.4 million “returning user” households—30 percent of the 8 million wireline ACP enrollees who are not new broadband households due to the benefit.

USERS FOCUSED ON COST RELIEF

For wireline ACP enrollees, this comes to about 5.6 million households. This figure is all remaining ACP subscribers who are not new to broadband because of the program (Category 1, 2.2 million households) and those who had a home wireline subscription before ACP but who had had service lapse in the past (Category 2, 2.4 million households).

Categorizing wireline ACP beneficiaries

The table below categorizes ACP wireline recipients based on estimates of those who are new home internet users, those who may have had service when they applied for an ACP wireline discount but have suffered service disconnection, and those who likely have had fairly consistent home service and use the ACP wireline benefit for cost relief. The table uses 22 percent as the share of newly connected households, splitting the difference between the two ACP user survey figures cited above and in line with the new FCC survey. The 2019–2022 growth in wireline broadband adoption among low-income households from ACS analysis also suggests that this 22 percent figure is reasonable. It is possible that survey respondents viewed questions on whether their ACP benefit made them “new to broadband” as having a time horizon preceding the pandemic.

Newly connected households	2,261,072	22%
Connected households that had service lapse	2,404,958	23%
Using ACP to sustain service	5,611,570	55%
TOTAL	10,277,600	100%

A Note About Wireless

Almost half (44 percent) of ACP wireline households are new or more consistent wireline subscribers, with the remainder benefiting through lower bills. The analysis to follow will focus very little on the wireless ACP subscribers beyond noting the cost relief that these households enjoy with ACP. Some 80 percent of individuals in the United States with incomes less than \$30,000 annually have a mobile broadband data plan, which would suggest that the strong majority of the 12.5 million ACP mobile broadband enrollees use the benefit for a plan or an upgrade to a plan they had already subscribed to.¹² Undoubtedly there are some who use ACP for wireless service who have transitioned from a traditional voice-only cell phone plan to a mobile broadband (or smartphone) plan. It is difficult, however, to estimate how many.

II. The ECONOMIC BENEFITS of BROADBAND ADOPTION

In this section, we estimate the benefits of subsidized broadband to each of the three categories. At one end, it is not hard to estimate the benefits for those ACP households that previously had consistent connectivity. If, for instance, having broadband at home is connected to income growth, the ACP does not change that proposition for households that have been online regularly over time. They benefit, rather, from the \$30-per-month cost relief on their internet bill.

A household's economic prospects may be impacted by going from no at-home subscription connectivity to having it. Newly connected households do not, from a cash-flow perspective, benefit from a \$30 subsidy (assuming they use ACP for a \$30-per-month service) since they were not paying anything for service prior to ACP. But if research shows that households increase incomes by, for example, \$10 per year once they have service, then the \$10 benefit is the relevant metric. As discussed below, the dollar impact is much greater than \$10.

Another dimension is the benefit for ACP households that have had subscriptions lapse but use the \$30-per-month subsidy to have more consistent home wireline service. Such households have been exposed to the income-boosting benefits of broadband, but not consistently. The entire hypothetical \$10 income benefit noted above probably does not result from service that ACP enables. But some portion of that \$10 income boost should be attributed to ACP.

For this analysis, two pieces of research will guide how to quantify the ACP's benefits:

1. Economic analysis that shows that households using a discounted internet offer have annual income boosts of up to \$2,200.

2. Analysis that values the annual benefit from greater purchasing choice and convenience at approximately \$1,285 per household.

The figure on the income effect comes from a 2021 study by George Zuo that examines the Comcast Internet Essentials (IE) discount offer.¹³ The Zuo paper elicits an estimate of the economic impact of the IE discount by relying on variation in:

- Comcast IE’s availability geographically.
- Labor market outcomes (i.e., probability of being employed, levels of household income) before and after the program’s inception.
- Individual eligibility—the analysis relies on a comparison in broadband adoption between IE-eligible households (which specifies a low-income threshold and having school-age children at home) and households that only meet the low-income criterion.

If, for instance, employment rates increased to a greater degree in Comcast service areas than in places Comcast does not offer service after IE was introduced and this is true when comparing increases among households that meet Comcast’s eligibility criteria versus non-eligible households with comparable incomes, then it is plausible to conclude that the increase is due to the IE offer. In this way, the Zuo analysis isolates the subsidy effect, namely, how much change in employment rates in Comcast areas before and after IE was introduced can be attributed to the IE program (and not increases that might otherwise occur over time).

The analysis then translates the changes in employment rates that can be attributed to IE into dollar figures. Zuo finds that “the program benefit to enrolled households is approximately \$2,200.”¹⁴

Other research has also found relationships between broadband adoption and economic change. A review of studies that assess the impact of broadband deployment and adoption shows broadly positive economic impacts from both type of interventions.¹⁵ Of interest is that this review finds that increases in broadband adoption tend to have stronger impacts than network deployment. Studies show that increases in broadband adoption positively impact median household income, women’s labor force participation, farm productivity, and employment.

The other type of benefit pertains to ecommerce—specifically, the convenience of shopping at home and having access to a greater variety of goods. A 2023 paper places a value of \$1,150 per household on average in 2017 on the convenience and quality gains associated with ecommerce.¹⁶ (Note: This is *not* an estimate of what households might save if ecommerce offers lower prices.) The authors estimate that the gains are twice as large for upper-income households relative to lower-income ones (using \$50,000 in household income as the threshold). At the time, this would suggest that the boost from ecommerce for lower-income households was approximately \$750. Since 2017, [ecommerce has grown](#) from 9.1 percent of all retail purchases to 15.6 percent (through the third quarter of 2023). Adjusting the 2017 \$750 estimate from ecommerce’s impact proportionately to the growth

in ecommerce by 2023 yields an estimate of \$1,285 for low-income households for the gains from ecommerce from the convenience of shopping at home and the ability to purchase a greater variety and quality of goods.

III. RESULTS: A DOLLAR of ACP INVESTMENT DELIVERS NEARLY TWICE THAT in ECONOMIC BENEFITS to ENROLLED HOUSEHOLDS

Having estimated who benefits and how, the analysis now focuses on how much. The discussion above suggests the following approach to assigning dollar benefits to different groups of ACP enrollees:

NEW SUBSCRIBERS: The analysis uses 22 percent as the figure for new home broadband subscribers among ACP households, and these households, with this newfound connectivity, are assumed to garner \$2,200 in employment/income benefits per the Zuo analysis. Additionally, there are the convenience/shopping benefits of \$1,285. Dollar benefits for this group do not include the \$30 subsidy; they did not have service before, so the subsidy does not offset any expenditure.

MORE-CONSISTENT SUBSCRIBERS: The discussion above shows that, at any given time, some low-income subscribers have suffered a service lapse in the recent past, meaning that some ACP households are returning users that become more-consistent subscribers. The analysis assumes that this proportion is 23 percent and further assumes that, in a given year, the time period of disconnection is two months.¹⁷ Thus, the benefit of ACP is not the full yearly amounts (both employment/income and convenience/shopping) but one-sixth for the 23 percent of existing ACP households that have suffered disconnection.

REMAINING ACP SUBSCRIBERS: ACP households that use the benefit mainly for cost relief have had consistent connectivity, which means the employment and convenience benefits do not change for them due to the subsidy. For this reason, the benefit for this group is simply the \$30 monthly subsidy.

Carrying through the calculations using these assumptions finds that, for ACP enrollment at 23 million households, subscribers gain \$16.23 billion in annual benefits from the subsidy against a cost of \$8.45 billion for the \$30-per-month subsidy over an entire year. This yields a benefit/cost ratio of 1.92 to 1. In other words, one dollar in ACP subsidy results in nearly \$2 in benefits. The following table summarizes the calculations.

CATEGORY	DESCRIPTION	DOLLAR BENEFIT (annual)
Income increase (Zuo)	New wireline subscribers	\$ 4,978,880,544
Income increase	Those whose subscriptions lapsed	\$ 294,206,578
Convenience/quality benefits (Dolfen, et al.)	Newly connected wireline subscribers	\$ 2,905,477,520
Convenience/quality benefits	Those whose subscriptions lapsed	\$ 515,061,924
Wireline beneficiaries	Consistently connected with \$30/month benefit	\$ 2,885,950,080
Wireless beneficiaries	Those who enroll in ACP for wireless with \$30/month benefit	\$ 4,652,064,000
TOTAL BENEFIT		\$ 16,231,640,646
COST (Service Subsidy)		\$ 8,452,224,000

The findings assume that newly connected households benefit from connectivity without incurring any costs (i.e., the \$30 subsidy covers their entire bill). It is possible, though, that the ACP subsidy induces spending, as some households may sign up for services that cost more than \$30 per month. That would reduce how much they benefit from any income boost. Even if all newly connected households pay \$15 per month out of pocket, it does not change the benefit-cost ratio very much. It falls to 1.87 to 1.

It is possible to do the same exercise for those consistently connected who use the \$30 subsidy to upgrade service and, perhaps, pay more out of pocket for service than they did prior to the ACP subsidy. Such an exercise (assuming \$15 per month more for service for these households) reduces the benefit-cost ratio to 1.75 to 1, but this does not include offsetting benefits from the upgraded service—which are difficult to quantify.

Overall, it is clear that ACP’s economic benefits to subscribers exceed the cost of the program by substantial margins, indicating that the \$30-per-month subsidy yields substantial returns.

These research findings quantify phenomena that show up clearly in survey research. A 2020 survey of Comcast Internet Essentials customers revealed a number of attitudes that are congruent with new at-home wireline users viewing the internet as a vehicle for economic opportunity and convenience.

- **EDUCATION:** Two-thirds (66 percent) use their home wireline service for schoolwork
- **FINANCIAL SERVICES:** 59 percent said they used the internet to access banking and financial services.
- **SHOPPING:** More than half (53 percent) use the internet to shop online
- **JOB SEARCH:** Half (43 percent) of low-income internet users with the IE discount use their service to look for or apply for a job.¹⁸

IV. OTHER CONNECTIVITY BENEFITS ARE SIGNIFICANT, THOUGH DIFFICULT TO TRACE to INCREMENTAL IMPROVEMENTS in CONNECTIVITY from ACP

The benefit-cost ratio identified above is conservative, as it excludes benefits to being online that are difficult to capture in a specific way in the context of the ACP subsidy.

a. DAY-TO-DAY CONVENIENCES

The convenience benefits of having a home wireline internet connection are worth underscoring. A survey conducted in 2018 found that overwhelming majorities of respondents said the internet helped them in saving time for day-to-day activities (84 percent said this), and 77 percent said the internet helped them to better manage their schedule to meet family needs.¹⁹ Online shopping is one element in these convenience benefits, as captured in the dollar figure above. But it is not the only kind of benefit.

Low-income families often face not just a scarcity of resources but also a scarcity of capacity to manage everyday affairs. Ironically enough, social scientists call this a “bandwidth tax,” although they are not referring to the internet.²⁰ Rather, it refers to the phenomenon of not being able to focus on long-term goals because so much cognitive effort is spent simply figuring out how to make ends meet in the short run.

Having a home high-speed connection likely helps in alleviating the bandwidth tax. A 2021 study of Comcast Internet Essentials households used a longitudinal design to see whether, through time, having home wireline service shows any relationship to how people evaluate their life prospects.²¹ Research shows that how people view their lives is an important metric—the more positive their self-evaluation of where they stand, the more likely they are to experience income increases over time.²² Holding a number of other factors constant, IE users who found the internet to be very helpful in carrying out online tasks had a higher

rating of their lives (by about 10 percent). This evidence that having home wireline access can give users more latitude to pursue social and educational opportunities not fully captured in the figures above.

b. HEALTH CARE

Access to health care information and using telehealth in lieu of in-person medical appointments are potential benefits of having home wireline internet service. These benefits may accrue to individuals—such as the convenience of not having to travel to an appointment or using electronic means to schedule appointments. Cheaper delivery of health care services is another kind of benefit that can lead to system-wide savings in service delivery. Research into use of online tools in health care yield several findings that point to cost savings:

- A study of Cigna health care insurance customers found that telehealth offered savings of \$93 for non-urgent health care issues, \$120 for specialist visits, and \$141 for urgent-care visits.²³
- An evaluation of a “co-payment free” telehealth program for University of Pennsylvania employees found telehealth visits to be 23 percent less expensive than in-person visits.²⁴
- An Anthem HealthCore study from 2014 found a savings of \$242 per episode in the use of telehealth for acute non-urgent care.²⁵
- Telehealth has the potential to reduce no-show rates for medical appointments, which not only raise provider costs but also result in fragmented care for patients. One study of a low-income and ethnically diverse patient group showed a 29 percent reduction in the odds of a no-show for patients using telehealth resources.²⁶
- Telehealth may save Medicare patients as much as \$100 million in travel in 2024, with that figure rising to as much as \$170 million by 2029.²⁷
- A study of 10 rural counties in the South found that telehealth, through preventable hospital visits and readmissions, preventable emergency room visits, and improved economic productivity, could result in annual cost savings of approximately \$43 million.²⁸

These findings are illustrative and are not an exhaustive review of studies on the cost impacts of telehealth. And there are always cautionary notes to sound. One study found that telehealth follow-up appointments that occur after an emergency department visit result in an increase in repeat visits to emergency departments (28 per 1,000 patients) and return hospital visits (11 per thousand patients).²⁹ Yet as providers and patients gain more experience in using telehealth for service delivery, it should be possible to realize significant cost savings in telehealth. One estimate puts the avoided spending in U.S. health care due to the adoption and expansion of telehealth at \$250 billion.³⁰

In aggregate, these potential savings are significant. However, it is difficult to estimate how much of that to assign to incremental gains in home broadband adoption from ACP. For that reason, cost savings from telehealth are not included in this study, even if it seems likely that ACP will contribute to savings in the delivery of health care services for low-income Americans.

c. WIRELESS and DEVICES

The analysis above does not include economic benefits from mobile broadband that ACP might facilitate. In the calculations above, mobile broadband is accounted for as a wash; the \$30 cost of the subsidy is offset as a \$30 benefit to the subscriber from the subsidy. Although the ACP subsidy may result in new mobile broadband subscribers, so many Americans—even low-income ones—already have mobile broadband service that the difference is likely to be small. Recent Pew Research Center data show that 90 percent of all adults have a smartphone and 79 percent of those whose annual incomes are below \$30,000 do.³¹

Patterns of intermittent service are also likely to look different for wireless. Economic hardship may not result in disconnection, but rather economizing on use of data to accommodate budget constraints. Conversely, the \$30 subsidy may mean upgrading data plans for low-income households rather than establishing new connections.

Even if it is possible to estimate incremental changes in mobile broadband adoption due to ACP, there is little guidance on how to quantify those changes in dollar terms. There is clearly a value to more people having mobile broadband and (for those using ACP to upgrade mobile data allotments) having more freedom for consuming content on the go. Much of this value may be in the convenience benefits noted above.

The analysis does not include the computing device benefit in the ACP, which allows eligible households to purchase a computing device for \$100.³² This is no doubt beneficial to the households that use this part of the benefit, although the device portion is a relatively small part of the ACP program (just 9 percent of ACP expenditures in December 2023 were for devices). Additionally, it would be difficult to estimate the incremental dollar benefit to a household of having one more computing device at home.

V. CONCLUSIONS

The Affordable Connectivity Program provides resources to get more people online, and the yield from additional and more-consistent household connectivity is sizable—about twice the subsidy’s cost. The \$2,200-per-year income boost for some recipients means they have found a job—or a better-paying one. The \$1,200 benefit from better-quality (or more conveniently purchased) goods available through ecommerce means the internet is helping people better meet their needs as consumers. For a family of four living at the poverty level (i.e., an annual income of \$30,000 in 2023), these benefits are hardly insignificant.

Yet it is important to underscore how these direct benefits for ACP households have public-good dimensions. Lower unemployment, for instance, puts less pressure on government budgets. The ACP also is a pathway to new kinds of participation in areas such as health care, where benefits may accrue to providers or employers as well as individuals.

Whether the benefits are direct or indirect, ACP is an indispensable part of the universal service policy toolkit. It furthers universal service values of connectivity and inclusiveness, and is doing so at a time in our nation’s history when communications services shape how citizens cope with social and economic change. Analysis of ACP’s impact thus far shows that this investment in connectivity is paying off handsomely.

ENDNOTES

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