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Three USDA Rural Broadband Programs: Areas and Populations Served

John Pender, Joshua Goldstein, Devika Mahoney-Nair,
and Hanna Charankevich



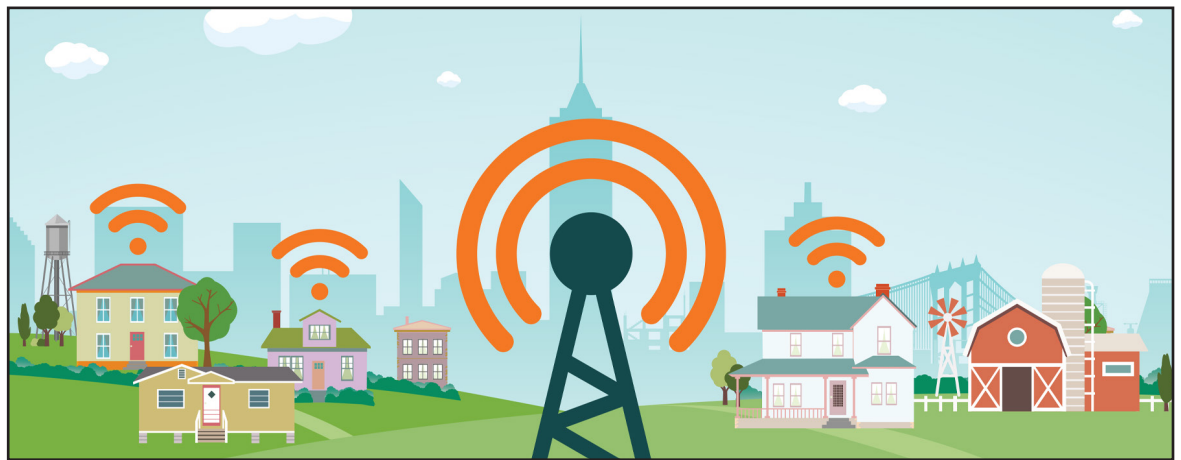


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Three USDA Rural Broadband Programs: Areas and Populations Served

John Pender, Joshua Goldstein, Devika Mahoney-Nair, and
Hanna Charankevich

Abstract

This study investigates the areas and populations served by three USDA rural broadband programs—the Broadband Initiatives Program (BIP), the Community Connect grant program, and the ReConnect program. BIP was the largest of these programs (through fiscal year 2021) in terms of net obligations and population in areas served (more than 1.3 percent of the U.S. population). However, BIP projects had the smallest value of obligations per person (\$875 in 2020 dollars) and per square mile of approved project service areas (\$26,000 in 2020 dollars). The populations served by all three programs tended to be more rural, less educated, poorer, and older than those in areas not served (for BIP) or ineligible (for Community Connect and ReConnect). All programs reached a larger share of the American Indian/ Alaska Native (AIAN) and White populations than other races and a larger share of the non-Hispanic than Hispanic population. A larger share of the AIAN population was served by Community Connect and ReConnect because a larger share of the AIAN population was eligible. However, a smaller share of the eligible AIAN population lived in approved ReConnect project service areas than most other racial groups because a smaller share of eligible AIANs lived in areas that applied to ReConnect.

Keywords: rural broadband programs, USDA, Broadband Initiatives Program, Community Connect Grants, ReConnect Program

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Key Abbreviations Used in This Report

ACS–American Community Survey

AIAN–American Indian or Alaska Native

ARRA–American Recovery and Reinvestment Act of 2009

BIP–Broadband Initiatives Program

BTOP–Broadband Technology Opportunities Program

CAF–Connect America Fund

CCG–Community Connect Grant program

DLT–Distance Learning and Telecommunications program

EBB–Emergency Broadband Benefit program

ERS–Economic Research Service

FCC–Federal Communications Commission

FOA–Funding opportunity announcement

FY–Fiscal year

GAO–U.S. Government Accountability Office

IIJA–Infrastructure Investment and Jobs Act of 2021

Kbps–Kilobits per second

Mbps–Megabits per second

NHOPI–Native Hawaiian or Other Pacific Islander

NTIA–National Telecommunications and Information Administration

PFSA–Proposed funded service area

PSA–Project service area

RBL–Rural Broadband Access Loan and Loan Guarantee program

RCP–ReConnect Program

RDOF–Rural Digital Opportunity Fund

RUCA–Rural-Urban Commuting Area

RUS–Rural Utilities Service

SUTA–Substantially Underserved Trust Area

TBCP–Tribal Broadband Connectivity Program

TIL–Telecommunications Infrastructure Loan and Loan Guarantee program

USDA–U.S. Department of Agriculture

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What Is the Issue?

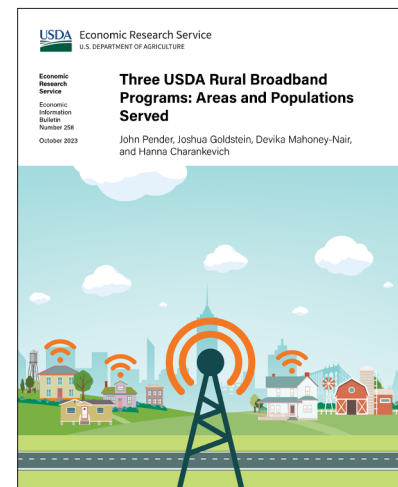
Addressing the uneven access to broadband—often called the digital divide—between rural and urban areas and across demographic and socioeconomic groups is a high priority for the U.S. Government. More than \$50 billion has been invested to date by Federal broadband programs, and more than \$85 billion of additional investment is planned under the Infrastructure Investment and Jobs Act of 2021 and the Rural Digital Opportunities Fund of the Federal Communication Commission (FCC). Despite the high priority of this issue, no published research has investigated who is benefitting from the programs. This study addresses this information gap, focusing on the areas and populations served by three USDA broadband programs—the Broadband Initiatives Program (BIP), the Community Connect Grant Program, and the ReConnect Program. Two questions are addressed:

- How were grants and loans provided by these programs during the study period (fiscal year (FY) 2009 to 2021) distributed geographically and across different populations?
- What distinguishes eligible communities that received these grants and loans from those that did not?

What Did the Study Find?

Size of the programs:

- The Broadband Initiatives Program (BIP) was the largest of the three programs in terms of funds obligated during the study period, with about \$3.6 billion (in 2020 dollars) in grants and loans (net of recissions) in FY 2010. ReConnect obligated \$1.5 billion (in 2020 dollars) in grants and loans from FY 2019 to FY 2021, and Community Connect obligated \$253 million (in 2020 dollars) in grants from FY 2009 to FY 2021.



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- The BIP was also much larger than ReConnect and Community Connect in terms of the population living in approved project service areas (PSAs): 1.3 percent of the U.S. population lived in BIP PSAs in 2010, compared to 0.12 percent of the 2020 U.S. population in approved PSAs of the first two rounds of ReConnect funding and 0.013 percent of the 2020 U.S. population in approved PSAs of Community Connect projects approved during FY 2018 to FY 2021.
- The inflation-adjusted value of obligations per person living in program PSAs was substantially less for the BIP (\$875 per person in 2020 dollars) than for Community Connect (\$3,369 per person) or ReConnect (\$3,777 per person), reflecting a greater average population density in BIP PSAs than in Community Connect or ReConnect PSAs. The BIP also had lower obligations per square mile of PSA area.

Populations served by the programs:

- Through approved projects, all three programs reached a much larger share of the American Indian/Alaska Native (AIAN) population and a larger share of the White population than other racial groups, and a larger share of the non-Hispanic than the Hispanic population.
- All three programs reached larger shares of people in micropolitan, small town, and rural census tracts than in metro tracts, consistent with the rural focus of these programs. On average, the populations in approved PSAs of the programs were less educated, poorer, and older than populations not in approved PSAs (for the BIP) or areas not eligible for the programs (for Community Connect and ReConnect). However, among populations eligible for Community Connect and ReConnect, people in areas with approved projects tended to be less poor.
- For Community Connect, the shares of the eligible White and AIAN populations living in PSAs of projects approved in FY 2018 to 2021 was greater than the share for all other racial groups, and a larger share of eligible non-Hispanics than Hispanics lived in approved Community Connect PSAs.
- Only 10 percent of AIANs who lived in areas eligible for ReConnect in 2020 were in PSAs of approved projects, the lowest percentage for any racial group. This resulted from a low percentage of the eligible AIAN population in areas proposed to be served in ReConnect applications and not from a greater share of AIANs in areas that would have been served by rejected or withdrawn applications.
- Other racial or ethnic groups with a disproportionately small share of the eligible population living in ReConnect PSAs include Asians, Native Hawaiians/Other Pacific Islanders, people of multiple races, and Hispanics.

Outreach and technical assistance efforts may help address some of the observed differences across racial and ethnic groups in their tendency to be included in applications to broadband programs and in their likelihood of having applications approved.

How Was the Study Conducted?

This study was based on an analysis of program administrative data on USDA rural broadband programs provided by the USDA, Rural Utilities Service (RUS) for FY 2009 through FY 2021 and Federal Communications Commission data to determine eligible areas for the Community Connect and ReConnect programs. These data were combined with Population Census data and American Community Survey data from the U.S. Department of Commerce, Bureau of the Census to identify demographic and socioeconomic characteristics of populations living in areas with approved projects for all three programs and in eligible and ineligible areas for Community Connect and ReConnect. The authors were unable to map the eligible BIP areas because of the nature of the eligibility criteria for that program. For ReConnect, RUS also provided data on project applications that were not approved, allowing for a more complete analysis of that program.

Three USDA Rural Broadband Programs: Areas and Populations Served

Introduction

There is uneven access to broadband between rural and urban areas and across different demographic groups in the U.S. population—often called the “digital divide.”¹ According to Federal Communications Commission (FCC) data, 17 percent of rural people and 21 percent of people living on Tribal lands lacked availability of fixed terrestrial broadband service anywhere in their census block in December 2019, compared to 1 percent of urban people (FCC, 2021).² In November 2021, 41 percent of households in nonmetropolitan (nonmetro) areas did not have wired high-speed internet service (defined as internet service installed at home through cable, digital subscriber line (DSL), or fiber optic service) in their homes, compared to 27 percent of metropolitan (metro) households (National Telecommunications and Information Administration (NTIA), 2022). The percentages of households without wired high-speed service were higher for American Indian or Alaska Natives (AIANs) (39 percent), Blacks/African Americans (34 percent), and Hispanics (33 percent) than for Whites (27 percent) or Asians (23 percent).

Addressing the digital divide is a high priority for the U.S. Government. More than \$47 billion was invested by the Federal Government between 2009 and 2017 to promote rural broadband development (U.S. Government Accountability Office (GAO), 2020).³ In the fiscal year (FY) 2018 Consolidated Appropriations Act, Congress established the U.S. Department of Agriculture (USDA) ReConnect Program to promote broadband development in unserved and underserved rural areas and appropriated nearly \$5 billion for that program between FY 2018 and FY 2022. In 2020, the FCC established the Rural Digital Opportunity Fund (RDOF), which will provide more than \$20 billion over 10 years to help close the rural-urban digital divide. The Infrastructure Investment and Jobs Act (IIJA) of 2021 included \$65 billion to expand access to affordable, reliable, high-speed broadband, with most of this funding targeted to unserved and underserved areas, including many rural areas.⁴

¹ According to the Federal regulations governing the USDA Rural eConnectivity (“ReConnect”) program, “Broadband service means any fixed terrestrial technology, including fixed wireless, having the capacity to transmit data to enable a subscriber to the service to originate and receive high quality voice, data, graphics, and video” (7 CFR 1740.2). As explained later in this report, the minimum upload and download speeds for Internet service to be considered “broadband service” according to USDA broadband program rules have increased over time.

² In this report, the term “rural” is used in multiple ways and may have different meanings depending on the context in which it is used. In some cases, the term is used in a generic sense and is not precisely defined, as in discussions of broad issues such as “rural development” or “the rural-urban digital divide.” When discussing data about rural areas, such as Federal Communications Commission data on the share of the “rural” population that has access to broadband, the authors relied on how rural is defined in the data source. When discussing eligibility criteria for specific USDA rural broadband programs, the authors stated and used the specific definition of rural used by those programs. In the analysis of the populations served by USDA broadband programs, the authors used the USDA, Economic Research Service’s Rural-Urban Commuting Area classification of census tracts to distinguish the degree of rurality/urbanicity of the areas served by the programs. Given the many ways in which the term “rural” is used in this report and in academic, policy, program, and public discussions of these issues, it is not possible to use a single precise definition for the term in all cases.

³ In this report, unless stated otherwise, dollar values are nominal values.

⁴ Table 1 lists 23 broadband programs operated by the Federal Communications Commission, the National Telecommunications and Information Administration, and the USDA Rural Utilities Service. The total amount of funding provided through grants, loans, and loan guarantees under programs that existed prior to 2020 during fiscal years 2015 to 2020 was nearly \$52 billion, while appropriations for new programs during fiscal years 2020 to 2022 totaled nearly \$75 billion (GAO, 2022a). The figures reported in table 1 for appropriations during FY 2020 to 2022 do not include appropriations required for the older programs that existed prior to FY 2020 or funds provided by FCC programs supported by the Universal Service Fund, such as the Rural Digital Opportunity Fund, which do not require congressional appropriations.

Besides ReConnect, several other USDA programs have supported broadband development in rural areas in the United States in the past two decades, and the Agriculture Improvement Act of 2018 and recent appropriations acts have increased funding for some of these programs. The USDA programs include longstanding ones such as the Telecommunications Infrastructure Loans and Loan Guarantees (TIL), Rural Broadband Access Loans and Loan Guarantees (RBL), Community Connect Grants (CCG), and Distance Learning and Telemedicine (DLT) grants.⁵ USDA broadband programs also include the Broadband Initiatives Program (BIP), a one-time program implemented as part of the American Recovery and Reinvestment Act (ARRA) of 2009.

Despite widespread recognition of the need to address the digital divide and increased Federal funding for such programs in recent years, research on the effects of Federal broadband programs is limited. Several published studies have investigated the effects of the RBL program (Kandilov & Renkow, 2010; GAO, 2014; Dinterman & Renkow, 2017; Kandilov et al., 2017; and Kandilov & Renkow, 2020). Kandilov and Renkow (2020) also investigated the effects of the Community Connect program. A few studies have investigated the effects of the Broadband Technology Opportunities Program (BTOP), the sister program to BIP established by ARRA and implemented by the National Telecommunications and Information Administration (NTIA) (ASR Analytics, 2014; Hauge & Prieger, 2015; Chang, 2021), and three recent studies investigated the effects of BIP (Bai et al., 2022; Pender et al., 2022; Rupasingha et al., 2023).⁶ No published studies have investigated the areas and populations reached by these programs.

This study investigated the areas and populations reached by three USDA broadband programs—the Broadband Initiatives Program, Community Connect, and ReConnect.⁷ The authors addressed the following questions:

- How are grants and loans provided by these programs distributed geographically and across different populations?
- What distinguishes eligible communities that have received these grants and loans from those that have not?

Although USDA's broadband programs are generally not targeted to specific groups, it is useful to know how well different groups are being reached by these programs to help identify any disparities that may exist and possible causes. For example, if for a particular program some minority groups are underrepresented in project service areas (PSAs) of approved projects relative to the population in eligible areas, there are multiple possible explanations. It could be because those groups are less likely to apply for the program, whether because of a lack of awareness of the program, the costs or complexities of applying, or other reasons. Or it could be that underrepresented groups apply to the program as frequently as other groups but are less likely to have their applications approved, perhaps because of a lack of capacity to prepare a project application that meets reviewers' expectations or from a lack of understanding of the program's requirements, among other reasons. Using data on the composition of populations in areas proposed to be served by program applications—including applications that were not approved as well as approved applications and on the populations in eligible areas— can help to identify possible deficiencies and may suggest approaches that could help address them, such as increased outreach or technical assistance.

The study focused on three USDA broadband programs: the Broadband Initiatives Program (BIP), Community Connect, and ReConnect. The authors used data provided by the USDA, Rural Utilities Service (RUS) on the funded PSAs of all three programs and were able to characterize the populations of these areas. For Community Connect and ReConnect, but not the BIP, the authors also were able to map eligible areas

⁵ The authors did not include the Distance Learning and Telecommunications (DLT) program among the USDA broadband programs that they investigated in detail in this report. Although the DLT program promotes the use of broadband for distance learning and telemedicine, it does not finance provision of broadband infrastructure, which is the focus of the programs discussed in this report.

⁶ The literature cited in this paragraph is reviewed in Pender et al. (2022) and Rupasingha et al. (2023).

⁷ Why RBL and TIL were not included in this analysis is explained on page 10.

(though not perfectly, as discussed below), allowing them to compare populations in approved PSAs to populations of other eligible areas and of ineligible areas. For ReConnect, the authors also obtained RUS data on proposed funded service areas (PFSAs) in applications that were not approved, enabling them to compare populations in approved PSAs to those in PFSAs that were not approved. The results of this analysis will follow a review of Federal broadband programs in general, the history of USDA's rural broadband programs, and the eligibility requirements of the three USDA programs of focus.

Federal Broadband Programs

The largest Federal programs supporting broadband development and adoption include programs administered by the FCC, NTIA, and USDA (table 1).

Federal Communications Commission Broadband Programs

The Federal Communications Commission's (FCC) longstanding programs include:

- The High-Cost Program, which subsidizes the cost of providing telephone and broadband service to rural, high-cost areas;
- The Lifeline Program, which subsidizes the cost of telephone and broadband subscriptions by eligible low-income households;
- The E-Rate Program, which subsidizes telephone and broadband provision to public schools and libraries; and,
- The Rural Health Care Program, which subsidizes telephone and broadband provision to public and nonprofit healthcare providers in rural areas.

The Universal Service Fund finances these programs through contributions collected from user fees through telecommunications companies. Between FY 2015 and FY 2020, these four programs spent nearly \$41 billion, with most of that through the High-Cost Program.

Earlier, the High-Cost Program focused on expanding and maintaining telephone service in rural high-cost areas, but in 2011, the FCC began to modernize the program to support rural broadband provision. The largest program initially established under modernization was the Connect America Fund (CAF), which allocated funds to support broadband in multiple phases. In 2012, CAF Phase I allocated \$115 million to support broadband expansion by large regulated "price cap" carriers.⁸ In 2015, the FCC offered \$10 billion over 6 years to price-cap carriers to expand broadband service in high-cost areas under the first part of CAF Phase II. In 2018, the FCC awarded nearly \$1.5 billion in support to competitive carriers⁹ through an auction (CAF-II auction) to be used over 10 years to provide fixed broadband and voice services in eligible high-cost areas. In 2020, the FCC established the Rural Digital Opportunity Fund (RDOF), which will provide \$20.4 billion for broadband expansion in rural high-cost areas over 10 years through auctions in two phases. The first phase auction, completed in November 2020, focused on providing broadband service to areas completely unserved by high-speed broadband and awarded \$9.2 billion in support to successful bidders. The second phase of the RDOF will offer support to partially unserved and wholly unserved areas that were not successful in the first phase auction.

⁸ "Price cap" carriers are large telecommunications companies whose prices are regulated by the Federal Communications Commission. Ten price cap carriers received funding under the Connect America Fund Phase I: Alaska Communications Systems, AT&T, CenturyLink, Consolidated Communications, Fairpoint Communications, Frontier Communications, Hawaiian Telcom, Verizon, Virgin Islands Telephone Co., and Windstream Communications (FCC, 2012).

⁹ Competitive carriers are other telecommunications companies besides incumbent price cap carriers.

Table 1

Summary of broadband programs of the Federal Communications Commission, National Telecommunications and Information Administration, and USDA, Rural Utilities Service

Agency	Program	Fiscal year program established	Forms of assistance ^a	Funding by older programs in FY 2015-20 ^a (dollars)	Appropriations for new programs in FY 2020-22 ^a (dollars)
FCC	High-Cost Program	1996	Subsidy	28.3 billion	
	Lifeline Program	1996	Discount	2.0 billion	
	E-rate Program	1996	Discount	9.5 billion	
	Rural Health Care Program	1996	Discount	853 million	
	Connected Care Pilot	2020	Reimbursement		≤ 100 million ^c
	COVID-19 Telehealth Program	2020	Reimbursement		450 million
	Emergency Broadband Benefit Program/Affordable Connectivity Program	2021	Discount		17.4 billion
	Emergency Connectivity Fund	2021	Reimbursement		7.1 billion
NTIA	Broadband Technology Opportunities Program	2009	Grants	4.7 billion ^b	
	Broadband Infrastructure Program	2021	Grants		300 million
	Connecting Minority Communities Pilot Program	2021	Grants		285 million
	Tribal Broadband Connectivity Program	2021	Grants		3.0 billion
	Broadband Equity, Access, and Deployment Program	2022	Grants		42.45 billion
	Digital Equity Competitive Grant Program	2022	Grants		1.25 billion
	Enabling Middle Mile Broadband Infrastructure Program	2022	Grants		1.0 billion
	State Digital Equity Capacity Grant Program	2022	Grants		1.44 billion
	State Digital Equity Planning Grant Program	2022	Grants		60 million
RUS	Broadband Initiatives Program	2009	Grants and loans	2.5 billion ^b	
	Community Connect Grant Program	2002 (pilot) 2004 (full)	Grants	132 million	
	Distance Learning and Telemedicine Program	1996	Grants	237 million	
	ReConnect Program	2018	Grants and loans	1.4 billion	
	Rural Broadband Access Loan/Loan Guarantee Program/Rural Broadband Program	2001 (pilot) 2003 (full)	Loans, loan guarantees, and grants	96 million	
	Telecommunications Infrastructure Loan Program	1949 (as rural telephone loan program)	Loans and loan guarantees	1.3 billion	
Total - FCC, NTIA, and RUS				51.9 billion	74.8 billion

FCC = Federal Communications Commission. FY = fiscal year; NTIA = National Telecommunications and Information Administration.

RUS = USDA, Rural Utilities Service.

^a Source is U.S. Government Accountability Office (GAO, 2022a) except where otherwise noted.

^b Source is appropriations for this program under the American Recovery and Reinvestment Act (ARRA) of 2009.

^c Not an appropriation; program is funded up to \$100 million from the Universal Service Fund.

Source: USDA, Economic Research Service using information from the General Accounting Office (2022a), American Recovery and Reinvestment Act of 2009, and the Federal Register.

Several new FCC programs have been established since early 2020 in response to the Coronavirus (COVID-19) pandemic. The Coronavirus Aid, Relief, and Economic Security (CARES) Act of 2020 provided \$200 million to the FCC to establish the COVID-19 Telehealth Program. This program was to help healthcare providers offer connected care services to patients at their homes or mobile locations in response to the pandemic. The Consolidated Appropriations Act of 2021 provided an additional \$250 million for this program. That act also provided \$3.2 billion to the FCC to establish the Emergency Broadband Benefit (EBB) program to help eligible households afford broadband service through monthly service and device discounts. The EBB program was made permanent and renamed the Affordable Connectivity Program (ACP) by the Infrastructure Investment and Jobs Act (IIJA) in 2021, which appropriated \$14.2 billion for the ACP. The American Rescue Plan Act of 2021 included \$7.1 billion for the FCC to establish an Emergency Connectivity Fund to help schools and libraries cover the costs of broadband connectivity, laptops, tablets, wi-fi hotspots, and other devices for use off campus by students, staff, and library patrons during the COVID-19 emergency period.

National Telecommunications and Information Administration Broadband Programs

The National Telecommunications and Information Administration's (NTIA) largest broadband program prior to the IIJA was the Broadband Technology Opportunities Program (BTOP), which was established and funded in 2009 by the ARRA with an appropriation of \$4.7 billion. The BTOP awarded competitive grants in FY 2009 and 2010 for several purposes, including \$3.5 billion for broadband infrastructure deployment, \$251 million for promoting sustainable adoption, \$201 million for expanding public computer centers, and \$293 million for developing a national broadband map (Hauge & Prieger, 2015). The BTOP was not focused on promoting broadband in rural areas, and a large percentage of the infrastructure grants supported middle-mile rather than last-mile infrastructure,¹⁰ unlike the BIP, its sister ARRA program implemented by the USDA, Rural Utilities Service (RUS).

More recently, the 2021 Consolidated Appropriations Act established three new broadband programs implemented by the NTIA: the Tribal Broadband Connectivity Program (TBCP), the Broadband Infrastructure Program, and the Connecting Minority Communities Pilot Program. The TBCP, which was expanded by the IIJA, will provide \$3 billion in grants to Tribal Governments to support broadband deployment on Tribal lands, telehealth, distance learning, broadband affordability, and digital inclusion. The Broadband Infrastructure Program will award \$300 million in grants to support high-speed fixed-broadband deployment in areas without broadband service. The Connecting Minority Communities Pilot Program will provide \$285 million in grants to historically Black colleges and universities, Tribal colleges and universities, and minority-serving institutions to support purchases of broadband service and equipment or to hire and train information technology personnel.

¹⁰ According to the Notice of Funds Availability for the Broadband Initiatives Program and the Broadband Technology Opportunities Program first-round projects (74 FR 33104), a "Last Mile project means any infrastructure project the predominant purpose of which is to provide broadband service to end users or end-user devices...". A "Middle Mile project means a broadband infrastructure project that does not predominantly provide broadband service to end users or to end-user devices, and may include interoffice transport, backhaul, Internet connectivity, or special access." Less than 2 percent of the value of Broadband Technology Opportunities Program awards were for last-mile infrastructure projects, compared to 25 percent for middle-mile projects and 62 percent for comprehensive community infrastructure (middle-mile projects supporting community anchor institutions) (LaRose et al., 2014).

In addition to expanding the TBCP, the IIJA established five new broadband programs to be implemented by NTIA. The largest of these programs is the Broadband Equity, Access, and Deployment (BEAD) Program, which was appropriated \$42.45 billion to fund matching grants to States, the District of Columbia, and U.S. territories to promote broadband planning, deployment, adoption, and mapping in unserved and underserved areas. The IIJA also established three grant programs to support digital equity, including the Digital Equity Competitive Grant Program (with \$1.25 billion in appropriations), the State Digital Equity Capacity Grant Program (\$1.44 billion), and the State Digital Equity Planning Grant Program (\$60 million). Finally, the IIJA established the Enabling Middle Mile Broadband Infrastructure Program with a \$1 billion appropriation.

USDA, Rural Utilities Service Broadband Programs

Besides establishing the Broadband Technology Opportunities Program (BTOP), the ARRA also established the Broadband Initiatives Program (BIP) as a USDA program with a \$2.5 billion appropriation. The USDA, Rural Utilities Service (RUS) implemented the BIP through loans, grants, and loan/grant combinations in two rounds of funding in FY 2009 and 2010. The BIP focused more than the BTOP on projects in rural areas, requiring that at least 75 percent of each project area be a rural area with insufficient access to high-speed broadband to facilitate economic development. Unlike the BTOP, the BIP focused mainly on funding last-mile infrastructure projects. In addition to funding terrestrial broadband infrastructure through grants and loans, in its second round, the BIP provided grants to support satellite infrastructure, broadband in rural libraries, and technical assistance.

USDA's ongoing broadband programs include the Rural Broadband Access Loan/Loan Guarantee (RBL) Program—renamed the Rural Broadband Program after the Agricultural Improvement Act of 2018 (“2018 Farm Bill,” P.L. 115–334) added a combination loan/grant option to this program—the Community Connect Grant Program, the Distance Learning and Telemedicine (DLT) Program, the Telecommunications Infrastructure Loan/Loan Guarantee (TIL) Program, and the ReConnect Program.

Initiated as a pilot program in 2001, the RBL was expanded to a full-scale program in 2003, first authorized by the Farm Security and Rural Investment Act of 2002 (“2002 Farm Bill,” P.L. 107–171) and reauthorized by subsequent farm bills. Since its inception, the RBL program has provided loans and loan guarantees to support broadband infrastructure development in eligible rural areas. Because of changes required by the 2018 Farm Bill, the program now also offers loan/grant combinations. Between FY 2001 and FY 2019, more than \$4 billion in loans were authorized under RBL, supported by total appropriations of \$158 million (Kruger, 2019).¹¹ Most of these loans were provided before FY 2009; the program has been much smaller since then. No funding was available for this program in FY 2020 and 2021.

Community Connect was established as a pilot program in 2002 and authorized as a full-scale program in 2004. This program provides grants to support broadband deployment in rural areas completely unserved by high-speed broadband. Between FY 2002 and FY 2019, the program provided an estimated \$271 million in grants (Kruger, 2019).

¹¹ The cost of Rural Broadband Access Loan and Loan Guarantee loans in terms of appropriations is less than the amount lent due to repayment of the loans. The annual levels of these loans reported by Kruger (2019) were based on estimates in annual appropriations bills and may differ from the actual amounts lent by the Rural Utilities Service.

The Distance Learning and Telecommunications (DLT) program was established by the Federal Agriculture Improvement and Reform Act of 1996 (“1996 Farm Bill,” P.L. 104–127) (Kruger, 2019). The program originally included both grants and loans, but since FY 2009, it has awarded only grants. DLT grants support the acquisition of equipment and software that operate via telecommunications to rural end-users of telemedicine and distance learning; they generally do not support broadband connectivity. Between FY 2002 and FY 2019, RUS provided \$543 million in DLT grants (program level of DLT grants, USDA Budget Summary, various years).

The TIL program is a continuation of the rural telephone loan program established in 1949. Since 1995, RUS has required that networks supported by this program provide broadband service as well (Kruger, 2019). The program focuses on completely rural areas and towns with a population of less than 5,000. It has provided hundreds of millions of dollars in loans in most years.¹² However, the annual appropriations required to support the program are generally less than a few million dollars, as repayment rates are high and loan interest rate subsidies are low.

The Rural eConnectivity (“ReConnect”) program was established by the Consolidated Appropriations Act of 2018 to promote broadband deployment in rural areas without sufficient access to broadband. The program provides a combination of loans and grants. It has received appropriations of \$4.8 billion from FY 2018 to FY 2022.¹³

USDA Broadband Infrastructure Projects, 2009–21

The USDA, Rural Utilities Service (RUS) provided data on projects approved under the BIP, Community Connect, RBL, TIL, and ReConnect programs during FY 2009 through FY 2021 (table 2).¹⁴ During this period, more than 900 projects were approved by the RUS under these programs, of which 52 projects were not completed (and for which all the approved funds were rescinded). More than one-third of these projects (322) were BIP projects, as were most of the uncompleted projects (39). There were 224 approved TIL projects,¹⁵ 181 ReConnect projects, 160 Community Connect projects, and 15 RBL projects.

¹² Not all the funds allocated by the Telecommunications Infrastructure Loan and Loan Guarantee Program (TIL) go to providing broadband service; some are used for improving and maintaining rural telephone service. The authors do not have data on the share of TIL loans used specifically for broadband.

¹³ Congress provided appropriations for ReConnect of \$600 million in FY 2018, \$550 million in FY 2019, \$555 million in FY 2020, \$635 million in FY 2021, and \$450 million in FY 2022 through annual appropriations acts, and an additional \$100 million in FY 2020 in the Coronavirus Aid, Relief, and Economic Security Act (Congressional Research Service, 2020). The Infrastructure Investment and Jobs Act of 2021 provided an additional \$1.926 billion for the program.

¹⁴ The Rural Utilities Service provided data on approved Telecommunications Infrastructure Loan and Loan Guarantee (TIL) projects only through FY 2019.

¹⁵ This total for the number of TIL projects is only for projects approved between FY 2009 and FY 2019.

Table 2

Number of approved USDA, Rural Utilities Service broadband projects, by program, FY 2009-21

Fiscal year	BIP	CCG	RBL	TIL	RCP	All RUS programs
2009	0	22 (1)	4 (1)	38 (1)	0	64 (3)
2010	322 (39)	0	0	33 (1)	0	355 (40)
2011	0	18	1	41	0	60
2012	0	7	1	7	0	15
2013	0	14 (1)	2 (1)	13	0	29 (2)
2014	0	8	0	14	0	22
2015	0	5 (3)	0	17	0	22 (3)
2016	0	8 (2)	1	14	0	23 (2)
2017	0	12	2	22 (2)	0	36 (2)
2018	0	22	1	13	0	36
2019	0	12	3	12	1	28
2020	0	8	0	NA	156	164 ^a
2021	0	24	0	NA	24	48 ^a
2009-21	322 (39)	160 (7)	15 (2)	224 (4) ^a	181 (0)	902 (52) ^a

BIP = Broadband Initiatives Program; CCG = Community Connect Grant Program; FY = fiscal year; NA = Not available; RBL = Rural Broadband Access Loan and Loan Guarantee Program; RCP = ReConnect Program; RUS = USDA, Rural Utilities Service; TIL = Telecommunications Infrastructure Loan and Loan Guarantee Program.

Note: The values in parenthesis are rescinded USDA, Rural Utilities Service broadband projects.

^a Totals exclude Telecommunications Infrastructure Loan and Loan Guarantee Program (TIL) projects approved in FY 2020 and FY 2021 since data were not available to the study authors for TIL projects approved during this period.

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service data.

A total of \$3.36 billion in grants and \$4.76 billion in loans were obligated under these projects during FY 2009 through 2021, net of rescissions (table 3).¹⁶ Nearly 60 percent of the grant funds obligated during this period were for BIP projects, which totaled nearly \$2.0 billion in net grants. Nearly two-thirds of the loan obligations were for TIL projects (\$3.1 billion), with most of the remaining loans for BIP projects (\$1.0 billion). Except for the BIP, all these programs funded only last-mile broadband infrastructure projects (table 4).

¹⁶ The total shown for loans excludes the value of TIL loans obligated in FY 2020 and FY 2021.

Table 3

Value of obligations (net of recissions) of USDA, Rural Utilities Service broadband project loans and grants, FY 2009-21

Fiscal year	BIP grants (dollars) million, nominal	BIP loans (dollars) million, nominal	CCG grants (dollars) million, nominal	RBL loans (dollars) million, nominal	TIL loans (dollars) million, nominal	RCP grants (dollars) million, nominal	RCP loans (dollars) million, nominal	All RUS grants (dollars) million, nominal	All RUS loans (dollars) million, nominal
2009	0	0	11	5	519	0	0	11	524
2010	1,979	1,025	0	0	497	0	0	1,979	1,522
2011	0	0	11	9	534	0	0	11	542
2012	0	0	4	38	63	0	0	4	101
2013	0	0	18	89	148	0	0	18	237
2014	0	0	13	0	190	0	0	13	190
2015	0	0	3	0	232	0	0	3	232
2016	0	0	12	4	191	0	0	12	196
2017	0	0	27	24	411	0	0	27	435
2018	0	0	47	20	162	0	0	47	182
2019	0	0	24	48	182	7	0	31	229
2020	0	0	16	0	NA	937	352	953	352 ^a
2021	0	0	57	0	NA	194	22	251	22 ^a
2009-21	1,979	1,025	243	237	3,129 ^a	1,138	374	3,360	4,764 ^a

BIP = Broadband Initiatives Program; CCG = Community Connect Grant Program; FY = fiscal year; NA = Not available; RBL = Rural Broadband Access Loan and Loan Guarantee Program; RCP = ReConnect Program; RUS = USDA, Rural Utilities Service; TIL = Telecommunications Infrastructure Loan and Loan Guarantee Program.

^a Totals exclude Telecommunication Infrastructure Loan and Guarantee Program (TIL) projects approved in FY 2020 and FY 2021 since data were not available to the authors for TIL projects approved during this period. Totals may not match due to rounding.

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service data.

Table 4

Number of nonrescinded USDA, Rural Utilities Service broadband projects, by type of project, FY 2009–21

Type of project	BIP	CCG	RBL	TIL	RCP	All RUS programs
Last mile	248	153	13	220 ^a	181	815 ^a
Middle mile	12	0	0	0	0	12
Satellite	4	0	0	0	0	4
Technical assistance	19	0	0	0	0	19
All nonrescinded projects	283	153	13	220 ^a	181	850 ^a

BIP = Broadband Initiatives Program; CCG = Community Connect Grant Program; FY = fiscal year; RBL = Rural Broadband Access Loan and Loan Guarantee Program; RCP = ReConnect Program; RUS = Rural Utilities Service; TIL= Telecommunications Infrastructure Loan and Loan Guarantee Program.

^a Totals exclude Telecommunication Infrastructure Loan and Guarantee Program (TIL) projects approved in FY 2020 and FY 2021 since data were not available to the authors for TIL projects approved during this period.

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service data.

Because of data limitations, this study focused on the areas and populations served by three of these broadband infrastructure programs: the BIP, Community Connect, and ReConnect. Geographic Information System (GIS) data on project service areas (PSAs) of RBL projects were only available for 8 of the 15 projects obligated since FY 2009. Furthermore, the eligibility criteria for this program—particularly the requirement for RBL projects that at least 15 percent of households in the PSA must be unserved by broadband—make it impossible to map the areas eligible for the program.¹⁷ Regarding data limitations for TIL projects, GIS data on actual areas served by the projects were not available. Only the local exchange areas of TIL borrowers—which may be much larger than the actual location of TIL project activity—were available.

Broadband Initiatives Program

The Rural Utilities Service (RUS) awarded BIP funds for grants, loans, and grant/loan combinations in two rounds conducted in FY 2009 and FY 2010. In both rounds, at least 75 percent of the proposed funded service area (PFSA) had to be classified as rural to be eligible for the BIP. As for most other RUS broadband programs, rural areas were defined for the BIP as areas not located within a city, town, or incorporated area having a population of more than 20,000 and not in an urbanized area that is contiguous and adjacent to a city or town with a population of more than 50,000.

Some of the eligibility requirements for the BIP changed between the first and second rounds of funding (table 5). In the first round, grant/loan combinations or loans could be provided only to eligible unserved or underserved areas. Eligible unserved areas were defined as areas where at least 90 percent of households lacked access to fixed terrestrial broadband service at a minimum advertised speed of 768 kilobits per second (Kbps) downstream and 200 Kbps upstream (768/200 Kbps), while underserved areas had a more expansive and complicated definition (table 5). Grant-only projects could only be awarded to remote unserved areas at least 50 miles from a non-rural area. In the second round, the eligibility requirements were relaxed and simplified, stating that at least 50 percent of each PFSA must have lacked broadband access at a minimum advertised speed of 5 megabits per second (Mbps) (downstream + upstream). In the second round, the BIP offered only a standard 75-percent grant/25-percent loan combination unless waivers were sought.

¹⁷ As discussed below, such percentage requirements for eligibility also cause problems in mapping the areas eligible for the Broadband Initiatives Program and ReConnect.

Table 5

Eligibility requirements of selected USDA, Rural Utilities Service broadband programs

Requirement	Broadband Initiatives Program	Community Connect	ReConnect
Rural	≥ 75 percent of PFSA must be rural ^a	100 percent of PFSA must be rural ^a	100 percent of PFSA must be rural ^a
Broadband availability	<p>Round 1: Grant-only projects limited to remote (≥ 50 miles from a non-rural area) unserved areas in which ≥ 90 percent of households lack access to facilities-based, terrestrial broadband service (fixed or mobile) at minimum advertised speed of 768 Kbps downstream and 200 Kbps upstream (768/200 Kbps). Grant/loan combinations and loan-only projects could be provided to unserved or underserved areas; underserved areas had to meet at least one of three conditions for last-mile projects: (1) ≤ 50 percent of households in PFSA have access to facilities-based, terrestrial broadband at 768/200 Kbps, (2) no broadband service provider advertises services with downstream speed ≥ 3 Mbps, or (3) ≤ 40 percent of households in the PFSA subscribe to broadband service.</p> <p>Round 2: Only 75 percent grant/25 percent loan combinations allowed without a waiver. At least 50 percent of premises in PFSA had to lack broadband service at minimum combined advertised speed of 5 Mbps (downstream + upstream).</p>	<p>100 percent of PFSA must be unserved by fixed terrestrial broadband.^b Maximum speeds to determine unserved areas have increased over time:</p> <p>FY 2002–2012: 200/200 Kbps</p> <p>FY 2013–2015: 3 Mbps (downstream + upstream)</p> <p>FY 2016–2017: 4/1 Mbps</p> <p>FY 2018–2021: 10/1 Mbps</p>	<p>Round 1: Grant-only projects require that 100 percent of households in PFSA lack access to fixed terrestrial broadband at 10/1 Mbps. Grant/loan and loan-only projects require ≥ 90 percent of households in PFSA lack access at 10/1 Mbps.</p> <p>Round 2: ≥ 90 percent of households in PFSA must lack access at 10/1 Mbps for all ReConnect projects.</p> <p>Round 3: ≥ 90 percent of households in PFSA must lack access at 100/20 Mbps for all ReConnect projects.</p>
Broadband service to be provided	<p>Applicants must provide service to the entire PFSA.</p> <p>Round 1: Broadband service must be provided at ≥ 768/200 Kbps.</p> <p>Round 2: Broadband service must be provided at ≥ 5 Mbps downstream + upstream.</p>	<p>Applicants must propose to serve all residential and business customers in the PFSA at minimum broadband grant speed. Minimum broadband grant speeds have increased over time:</p> <p>FY 2002–2012: 200/200 Kbps</p> <p>FY 2013–2015: 5 Mbps (downstream + upstream)</p> <p>FY 2016–2017: 10/1 Mbps</p> <p>FY 2018–2021: 25/3 Mbps</p>	<p>Applicants must propose to serve all premises (residences, businesses, and farms) in the PFSA at minimum speeds. Minimum required speeds have increased over the funding rounds:</p> <p>Rounds 1 and 2: 25/3 Mbps.</p> <p>Round 3: 100/100 Mbps.</p>

Requirement	Broadband Initiatives Program	Community Connect	ReConnect
Areas served by other programs	Existing service areas of RUS broadband program borrowers were not eligible for BIP.	PFSA's of projects must not overlap with service areas of current RUS broadband program borrowers and grantees. ^c	<p>Round 1: Service areas of borrowers that have existing RUS broadband loans are ineligible for applicants other than existing RUS borrowers. Existing RUS broadband loan borrowers may receive funding under ReConnect if they have complied with terms of prior RUS broadband loan but service in the PFSA does not meet the current definition of broadband service. Service areas that received Community Connect grants are eligible if they do not have sufficient access to broadband service, except service areas in which project is still under construction. Service areas that received a 100-percent grant under BIP are eligible if they do not have sufficient access to broadband, but if the applicant is the BIP grantee, they may only request a 100-percent loan. Areas that received State funding to deploy broadband at a minimum speed of 10/1 Mbps are ineligible. Funding for service areas of the FCC Connect America Fund Phase II Auction (CAF II) can only be requested by the entity receiving CAF II support and can only receive a 100-percent loan.</p> <p>Round 2: Same requirements as for Round 1 except: areas that received State funding to deploy broadband service are no longer ineligible, and service areas of companies that received a ReConnect award in Round 1 are not eligible for funding in Round 2.</p> <p>Round 3: All areas without sufficient access to broadband — including those that received support from other RUS programs or the FCC — are eligible.^d</p>

BIP = Broadband Initiatives Program; CAF = Connect America Fund; FCC = Federal Communications Commission; FY = fiscal year; RUS = Rural Utilities Service; PFSA = Proposed Funded Service Area; Kbps = kilobits per second; Mbps = megabits per second.

^a For all 3 programs, a rural area means any area not located within (1) a city, town, or incorporated area that has a population of greater than 20,000; or (2) an urbanized area contiguous and adjacent to a city or town that has a population greater than 50,000.

^b Through FY 2019, unserved areas included areas without either fixed or mobile terrestrial service at the minimum speed.

^c Requirement added in FY 2014.

^d In areas receiving or under consideration for FCC Rural Digital Opportunity Fund (RDOF) awards, the application should explain why RUS should provide additional funding and ensure that ReConnect and RDOF funds are used for complementary purposes and not for duplicative ones.

Source: USDA, Economic Research Service compilation based on program regulations and notices of funding availability published in the Federal Register.

Through the 2 rounds of funding applications, the RUS approved 322 BIP projects, including 299 terrestrial infrastructure projects with a total value of grants of \$2.2 billion and loans of \$1.2 billion, 4 grants for satellite projects with a total value of \$100 million, and 19 technical assistance grants totaling about \$3 million. Sixty-three of the terrestrial infrastructure projects were approved in Round 1 and 236 in Round 2. Thirty-nine of the original infrastructure projects were not completed, resulting in \$315 million of rescinded funds. Some of the approved funds were not spent on the completed projects, resulting in an additional \$244 million of rescissions. Net of rescissions, \$2.9 billion was provided for terrestrial infrastructure projects.

Almost all the 260 completed BIP terrestrial infrastructure projects (95 percent) were last-mile projects; only 12 projects were middle-mile projects (table 4). Investments in a variety of broadband technologies were supported, though 65 percent of the completed projects provided fiber optic service to the household or business (“fiber-to-the-premises”). Other technologies supported by a smaller number of BIP terrestrial infrastructure projects included asymmetric digital subscriber lines and very high bit-rate digital subscriber line technologies over copper phone lines, fixed wireless, mobile wireless, hybrid fiber-coaxial cable, and broadband-over-power-line technologies.

Community Connect Grant Program

The Community Connect Grant (CCG) program provides grants to support the provision of “community-oriented connectivity” broadband services that foster economic growth and deliver enhanced educational, healthcare, and public safety benefits. Community Connect projects support the provision of service only to rural areas that are completely unserved by broadband services. Rural areas are defined in the same way for the Community Connect Grant program as for the BIP. The definition of unserved areas has changed over time. When the program was initiated as a pilot in 2002, areas lacking broadband service at a minimum speed of 200 Kbps in both download and upload directions were considered unserved. Since then, the speeds for an area considered unserved have increased, eventually to less than 10 Mbps download or 1 Mbps upload (10/1 Mbps) in FY 2018 (table 5). The minimum speeds that Community Connect projects must achieve—the broadband grant speed—have also increased from 200/200 Kbps initially to 25/3 Mbps by FY 2018.

Community-oriented connectivity involves cultivating the deployment of new broadband services that improve economic development and provide enhanced educational and healthcare opportunities in rural areas. Recipients of Community Connect grants must offer service at the broadband grant speed to all residential and business customers within the PFSA; offer free service at the broadband grant speed to all Critical Community Facilities¹⁸ located within the PFSA for at least 2 years; and provide a community center with at least two computer access points and wireless access at the broadband grant speed free of charge to all users for at least 2 years. Community Connect PFSA must not overlap with the service areas of existing RUS borrowers and grantees. Community Connect grantees must contribute a matching contribution of at least 15 percent of the grant value toward the completion of the project.

¹⁸ Critical Community Facilities provide an essential service to the local community for the orderly development of the community in a primarily rural area and do not include private, commercial, or business undertakings. Examples include public schools, police and fire stations, and public libraries.

In scoring and ranking applications for Community Connect projects, RUS considers several factors, such as location in a persistent-poverty county or out-migration community, degree of rurality of the location, being a Substantially Underserved Trust Area (SUTA),¹⁹ the speed of broadband service to be provided, provision of service to disabled community members, or other factors indicated in the funding opportunity announcement (FOA). The FOAs specify the factors used in ranking applications and their weights, which have varied over the years.

Like those of the BIP, CCG projects have supported the provision of a variety of broadband technologies. However, more than three-fourths of Community Connect projects approved since FY 2013 supported fiber-to-the-premises—a larger percentage than the percentage of BIP projects that supported this technology.

ReConnect Program

The ReConnect Program (RCP) provides loans, grants, and 50-percent loan/50-percent grant combinations to support broadband deployment in rural areas without sufficient access to broadband, with rural areas defined using the same criteria as those for the BIP and Community Connect and with “sufficient access to broadband” as defined in the Funding Opportunity Announcement. Mobile and satellite services are not considered in determining whether a ReConnect PFSA lacks sufficient access to broadband. In grant-only projects, grantees must provide a matching contribution of 25 percent of the cost of the overall project.²⁰

ReConnect has accepted applications through three rounds of funding conducted in FY 2019, FY 2020, and FY 2022. In the first two rounds, the minimum speed for an area to qualify as having sufficient access to broadband was 10/1 Mbps (table 5). In the first round, 90 percent of households in a PFSA had to lack broadband access at this speed for the project to be eligible for a ReConnect loan or loan/grant combination, while 100 percent of households in the PFSA had to lack access at this speed for the project to be eligible for grant-only funding. In the second round, these requirements were changed so that 90 percent of the PFSA must lack sufficient access to broadband for all ReConnect projects. This requirement was continued in the third round of funding, but the minimum speed used to define sufficient access to broadband was increased to 100/20 Mbps.

Applicants for ReConnect must propose to provide broadband service to all premises (including all households, farms, and businesses) that lack sufficient access to broadband in the PFSA. The minimum broadband speed that ReConnect projects must achieve has increased from 25/3 Mbps in the first two rounds to 100/100 Mbps in the third round.

In the first two rounds of ReConnect funding, areas that had been served by other Federal broadband programs were eligible for ReConnect projects only under certain conditions (table 5). In the third round, eligibility limitations on recipients of prior broadband program funding were eliminated so that the service areas of existing RUS borrowers or areas that receive FCC support and lack sufficient access to broadband were eligible for ReConnect.

¹⁹ A Substantially Underserved Trust Area (SUTA) is defined as a community in American Indian trust land (as defined in 38 U.S.C. 3765) that the Secretary of Agriculture determines has a high need for assistance. The Rural Utilities Service (RUS) administers the SUTA provisions of the Food, Conservation & Energy Act of 2008 (2008 Farm Bill). The SUTA provisions authorize the RUS to provide tools to help finance improvements in electric, telecommunications, water, and sewer infrastructure in SUTAs. The statute provides the RUS discretionary authority to offer interest rates as low as 2 percent; waive nonduplication requirements; waive matching or credit-support requirements; extend repayment terms; and give eligible applications the highest funding priority when projects serve a SUTA.

²⁰ In the third round of ReConnect, grants to Tribal Governments and Socially Vulnerable Communities were exempted from the matching contribution requirement. A “Socially Vulnerable Community” is defined in the third-round Funding Opportunity Announcement as a community or area identified in the Center for Disease Control’s Social Vulnerability Index with a score of 0.75 or higher. Up to \$350 million was made available for grants to Tribal Governments and Socially Vulnerable Communities in the third round of ReConnect.

As with Community Connect and other RUS programs, the RUS may give priority to Substantially Underserved Trust Areas (SUTAs) in considering applications to ReConnect, provide loans at a reduced interest rate, and provide other favorable terms.²¹ Many factors are considered in scoring and ranking ReConnect applications, and some of the factors have changed over the funding rounds. In the first two rounds, the factors considered included the rurality of the PFSA; the number of farms and businesses to be served; the speed performance of the broadband service to be offered; the number of healthcare centers, educational facilities, and other critical or essential community facilities to be served; the provision of service in Tribal lands; the provision of service in accordance with a State or Tribal broadband plan; and the provision of service in an Opportunity Zone.²² In the third round, the factors considered included the rurality of the PFSA, the level of existing service, economic need, affordability of the broadband service to be provided, providing service in Tribal lands, and projects serving Socially Vulnerable Communities, among other factors.

ReConnect received 318 applications for funding during the first two funding rounds, of which 181 were approved, 119 were rejected, and 18 were withdrawn (table 6). More applications were submitted, and a larger share was approved in the second round than the first round.

Table 6
Number of ReConnect applications, FY 2019 and FY 2020

Status	FY 2019	FY 2020	Both years
Approved	76	105	181
Rejected	61	58	119
Withdrawn	9	9	18
All applications	146	172	318

FY = fiscal year.

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service data.

Nearly half of ReConnect applications in the first two rounds were submitted by for-profit Internet Service Providers (ISPs)—either a limited liability company (LLC) or a corporation (table 7). Other relatively common types of applicants included telephone cooperatives, electric cooperatives, and local (county or municipal) government entities. Less common were applications by Tribal Governments, regional development organizations, regional consortiums dedicated to improving broadband access, and entities such as private companies involved in other lines of business that were not yet ISPs. Among these different types of applicants, telephone cooperatives had the highest percentage of applications approved (81 percent), followed by for-profit ISPs (59 percent), local governments (50 percent), electric cooperatives (42 percent), and Tribal Governments (40 percent). Regional development organizations, regional consortiums, and other entities had much lower success rates in having their ReConnect applications approved.

²¹ This authority was specified in the Funding Opportunity Announcements for the first and second rounds of ReConnect but not in the announcement for the third round. It is also mentioned in the current (as of 5/9/2022) program regulations.

²² Distance from a city was not considered in determining the rurality of the proposed funded service area (PFSA) in the first round but was in the second-round Funding Opportunity Announcement. Evaluation points for projects in accordance with a Tribal broadband plan and for projects serving an Opportunity Zone were included in the second round but not in the first round.

Table 7

Types of entities applying for ReConnect, number of applications, FY 2019 and FY 2020

Type of applicant	Application status			All applications
	Approved	Rejected	Withdrawn	
ISP, for-profit LLC or corporation	91	54	9	154
ISP, telephone cooperative	51	9	3	63
ISP, electric cooperative	20	24	4	48
Local government (county or municipal)	13	13	0	26
Tribal Government	2	3	0	5
Regional development organization or regional consortium	1	5	0	6
Other	3	11	2	16
Total	181	119	18	318

FY = fiscal year; ISP = internet service provider; LLC = limited liability company.

Source: USDA, Economic Research Service analysis of Rural Utilities Service data.

Across both rounds, the most common reason applications were rejected was that they were ineligible due to the availability of broadband service at a minimum of 10/1 Mbps to at least 10 percent of the households in the PFSA (table 8).²³ This reason was particularly common among rejected applications in the first funding round. In the second round, lack of financial feasibility and/or missing or insufficient information in the application were the most common reasons for its rejection. Other less-common reasons cited by RUS reviewers for rejecting an application included concerns about the technical feasibility of the project, the applicant's insufficient matching funds for meeting requirements of the funding opportunity announcement, or the proposed funded service area overlaps with an area served by an FCC program (CAF-II auction or RDOF) or a previous RUS borrower.

In contrast to the BIP and Community Connect, 97 percent of the approved projects in the first two rounds of ReConnect supported fiber-to-the-premises.

²³ In every ReConnect proposed funded service area that was rejected for this reason, there was at least one census block that had at least one Internet service provider providing broadband service at 10/1 Mbps or faster speed, according to Federal Communications Commission (FCC) Form 477 data in December 2020. However, as noted in the box "Mapping Eligible Areas for Community Connect and ReConnect," the FCC data may overstate broadband availability in census blocks since the availability of service somewhere in a census block does not imply that service is available everywhere in the block, and because the actual Internet speeds achieved are often less than the speeds advertised or claimed to be available in census blocks in the Form 477 data.

Table 8

Reasons ReConnect applications rejected, first two funding rounds

Reason	FY 2019 (percent)	FY 2020 (percent)	Both years (percent)
10/1 Mbps service available	62.3	27.6	45.4
Financial feasibility	19.7	44.8	31.9
Missing or insufficient information	13.1	43.1	27.7
Technical feasibility	1.6	15.5	9.2
Insufficient matching funds	1.6	13.8	7.6
PFSA overlaps CAF-II auction or RDOF area	1.6	5.2	3.4
PFSA overlaps RUS borrower area	0.0	3.4	1.7
Other	1.6	6.9	3.4

CAF = Connect America Fund; FY = fiscal year; Mbps = megabits per second; PFSA = Proposed Funded Service Area; RDOF = Rural Digital Opportunity Fund.

Note: Percentages add to more than 100 percent because multiple reasons were stated in many cases.

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service data.

Data and Methods

Rural Utilities Service (RUS) geographic information system (GIS) data on approved broadband project service areas (PSAs) were used to map areas that have had approved broadband projects for three programs – the BIP, Community Connect, and ReConnect. The time frames of projects included in the GIS data included all projects approved under the BIP (approved in FY 2010), Community Connect projects approved between FY 2013 and FY 2021, and all projects approved in the first two rounds of ReConnect (approved in FY 2019, FY 2020, and FY 2021). For ReConnect, the RUS also provided GIS data on PFSAs that were not approved, either because the application was rejected or withdrawn.

The areas eligible for these programs could not be mapped with complete accuracy for reasons explained in the box “Mapping Eligible Areas for Community Connect and ReConnect.” The authors mapped a conservative approximation of areas eligible for Community Connect and ReConnect, as explained in the box.

Mapping Eligible Areas for Community Connect and ReConnect

Of the three programs that were investigated in detail in this study, the authors mapped only the approximate areas eligible for Community Connect and ReConnect. There was no attempt to map the areas eligible for the Broadband Initiatives Program (BIP), in part because the program stipulated that 75 percent of the area of each BIP proposed funded service area (PFSA) must be rural, making it impossible to map the exact locations that were eligible. An unlimited set of possible combinations of urban or suburban areas could have been combined with rural areas to create PFSAs that would meet this criterion. In addition, some of the criteria used for eligibility—such as the definition of underserved areas used in the first round (and explained earlier) and the changes in eligibility criteria between the first and second rounds—added to the difficulty of mapping areas eligible for the BIP.

The eligibility criteria for the Community Connect program were relatively simple to map: eligible areas must be rural, completely unserved by broadband as defined in the Funding Opportunity Announcement (FOA) at the time, and not overlap service areas of existing USDA, Rural Utilities Service (RUS) broadband program borrowers and grantees. The RUS-mapped rural areas eligible for RUS broadband programs and areas served by RUS broadband program borrowers and grantees are

publicly available on the USDA ReConnect Program website. For the eligibility mapping for both Community Connect and ReConnect, the authors used the version of these maps dated July 3, 2019. To identify areas unserved by broadband service at a speed of at least 10/1 megabits per second (Mbps), the authors used the December 31, 2020, version (version 1) of the Federal Communications Commission (FCC) map of fixed terrestrial broadband availability, based on the FCC Form 477 data.

Although the eligibility criteria for Community Connect are relatively simple, complexity arises in the mapping because the criteria and measures relative to the criteria have changed over time. The areas served by prior RUS program borrowers and grantees have changed, as has the definition of areas unserved by broadband (e.g., areas considered unserved changed from those with service at speeds less than 4/1 Mbps in fiscal year (FY) 2016 and 2017 to 10/1 Mbps in FY 2018), as well as has the actual availability of broadband service. Thus, program eligibility is a dynamic concept that cannot be fully reflected by maps using data collected for a single point in time. In addition, there are well-known problems regarding the accuracy of the FCC Form 477 data. The data are supplied by internet service providers, which report the availability of broadband service at maximum advertised speeds in each census block rather than at the speeds actually achieved, do not report how the availability of broadband service is distributed within census blocks, and do not provide data on broadband availability to nonresidential users such as businesses, farms, community institutions, or recreational venues (Whitacre & Biedny, 2022).¹ Despite these shortcomings of the FCC data, the authors used the data in classifying areas as eligible for Community Connect and ReConnect as they were the best available data for this purpose when this analysis was conducted.

Given these considerations, the maps of areas eligible for the Community Connect and ReConnect programs are only approximations used to compare characteristics of eligible areas not yet served by a project under one of these programs to areas that are served by such projects. Since broadband service at the speeds required for an area to be served has expanded over time, using a later date of the FCC availability data (December 31, 2020) rather than the dates of the application period for most projects considered in this analysis tends to result in a conservative estimate of the areas that were eligible during the application periods.² In the case of Community Connect projects, the authors restricted the focus to projects approved in FY 2018 through FY 2021 to limit the downward bias in eligibility estimates based on map data from a date later than when projects were approved.³ For ReConnect projects, the applications for the first two rounds (the rounds included in this analysis) were all submitted in FY 2019 and FY 2020, limiting this source of bias in the estimation. However, to the extent that the FCC data overstate the availability of broadband in rural areas, as many have argued (Ford, 2019; Mack et al., 2019), there will be an additional source of downward bias in the estimated eligible area. Finally, for ReConnect eligibility, we were not able to map the areas in which 90 percent of households lack access to broadband. This was for the same reason the 75 percent of areas' rural thresholds for the BIP could not be mapped, and so the authors instead mapped "eligible areas" for ReConnect by focusing on areas with no access to broadband service at the 10/1 Mbps speed threshold. This also caused a downward bias in the estimated eligible area for ReConnect.

¹ Until December 31, 2019, the Federal Communications Commission (FCC) Form 477 broadband deployment data included data on the provision of broadband service to businesses and governments, but those data have since been discontinued.

² In the appendix, the authors show the results of the analysis using FCC data on broadband availability on December 31, 2018, instead of FCC data on broadband availability on December 31, 2020, to classify eligibility for Community Connect and ReConnect. Using earlier FCC data results in larger estimates of eligible areas and eligible populations for these programs and, thus, smaller shares of the eligible population being served by approved projects. Nevertheless, all the qualitative results discussed below—comparing populations eligible or ineligible for these programs across racial and ethnic groups and across geographic types—are robust to using the earlier FCC data to classify eligibility (compare appendix figures A1, A2, A4, and A5 to figures 6, 7, 10, and 11, respectively). Furthermore, very little quantitative difference in the mean characteristics of ineligible and eligible populations are evident, as shown by comparing appendix figures A3 and A6 to figures 8 and 12 in the main report.

³ Restricting the analysis of Community Connect projects to those submitted in FY 2018 to FY 2021 also ensures that the broadband speed used to define eligible areas (service at speeds less than 10/1 Mbps) applied for the applications submitted throughout this period. Prior to FY 2018, the Community Connect program used a different speed to define broadband service.

The GIS files of proposed funded service areas (PFSAs) were linked to other RUS data on project characteristics, such as the date the project was approved (or rejected, in the case of rejected ReConnect project applications) and the amount of the grant and/or loan approved, among other characteristics. These GIS files were overlaid on the maps approximating the eligible areas for Community Connect and ReConnect, enabling the identification of regions that had approved projects, eligible regions that did not yet have approved projects, and ineligible regions under these two programs.²⁴ For ReConnect, the authors were also able to map PFSAs of project applications that were not approved in the first two funding rounds, enabling further analysis of characteristics of places with approved projects compared to those of places with unapproved applications and to those of eligible places for which no application had been submitted.

These GIS files were intersected with maps of census blocks, using either the 2010 or 2020 census block geography, depending on the program considered. The map of approved BIP project service areas was intersected with the 2010 census block geography since that census date closely matches the dates when BIP projects were approved. The ReConnect GIS files were intersected with the 2020 census block geography for the same reason. For Community Connect, the authors focused the analysis on projects approved between FY 2018 and FY 2021 because the definition of areas unserved by broadband was constant during this period: areas without broadband service with speeds of at least 10/1 Mbps were considered unserved for the purposes of Community Connect program eligibility during these years but were changing in the years prior to FY 2018. Thus, the authors also intersected the Community Connect GIS files with the 2020 census block geography because that census date more closely approximated the dates when the Community Connect projects analyzed here were approved than the 2010 census date.

Using these maps of project regions, eligible regions, and census blocks, the authors estimated the following:

- the total population and population by race and ethnicity residing in approved PSAs for all three programs,
- the total population and population by race and ethnicity residing in areas estimated to be eligible for the Community Connect and ReConnect programs, and,
- the total population and population by race and ethnicity residing in PFSAs of ReConnect project applications in the first two funding rounds that were not approved.

For census blocks where the entire area of the block was not entirely within or outside one of the areas defined by the three characteristics noted above, the authors estimated the population (total or by race or ethnicity) of the block within one of those areas as the population of the block (total or by race or ethnicity) multiplied by the share of the area of the block within one of those areas. These population estimates, aggregated across the entire nation or subregions of the nation, are the basis for the results presented below regarding the shares of the population (total and by race and ethnicity) that have benefited from these three programs, the shares of the eligible population that have benefited from the Community Connect and ReConnect program, and the shares of the population in areas with rejected or withdrawn applications compared to the shares with approved applications.

The authors also estimated some demographic and socioeconomic characteristics of populations in areas served by or not yet served by these three broadband programs by linking estimates of the populations served/not yet served by the programs to American Community Survey (ACS) data at the census tract level. Three demographic/socioeconomic indicators that the authors used based on the ACS data were the shares

²⁴ As noted, the authors were unable to map areas eligible for the BIP.

of the adult population with a high school education or less, the population in poverty, and the population aged 65 or older. These indicators are of interest because broadband adoption has been found in the literature to be related to educational attainment, poverty or income, and age (e.g., Whitacre & Mills, 2010; Hauge & Prieger, 2015; Stenberg 2018; Pender et al., 2022). For each indicator, weighted means were estimated, with the population of the group of interest (e.g., the White population in areas with an approved ReConnect project) used as the weight to identify the characteristics of that population. For populations affected by the BIP, the authors used ACS data for the period 2006–10 (just prior to implementation of the BIP) and for populations affected by Community Connect projects approved in FY 2018–21 and ReConnect projects submitted in FY 2019 and 2020, we used ACS data for the period 2015–19.

We estimated characteristics for population groups within the United States as a whole and separately for population groups within metropolitan (metro) census tracts, micropolitan (micro) census tracts, and small town/rural census tracts, with these groups defined using the 2010 version of the USDA, Economic Research Service’s Rural-Urban Commuting Area (RUCA) codes.²⁵ Since updated RUCA codes based on the 2020 Population Census were not yet available at the time of this analysis, the analysis by geographic types of metro, micro, and small town/rural areas could not be conducted using the 2020 Population Census data.

Areas and Populations Served by Selected USDA Broadband Programs

Broadband Initiatives Program

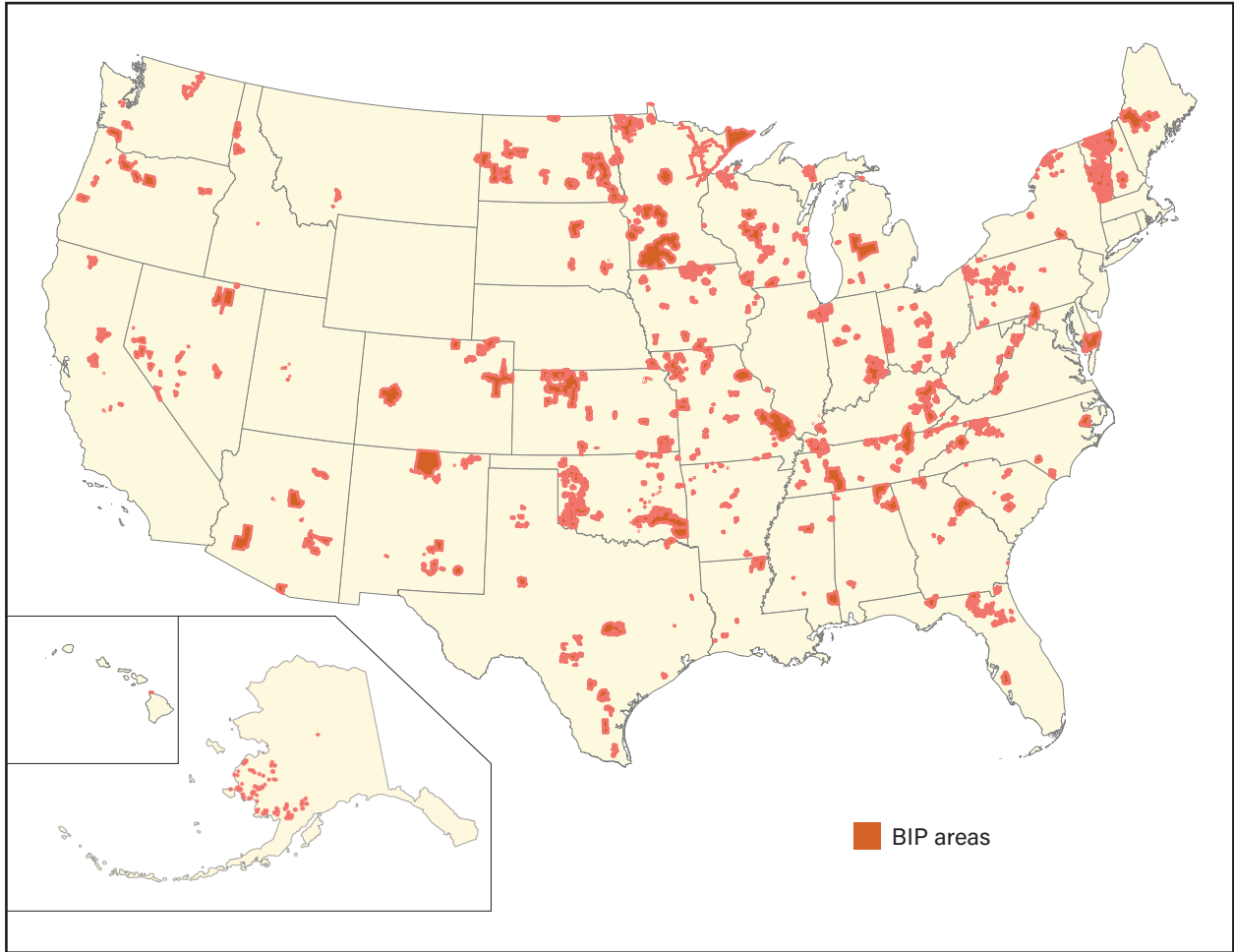
BIP projects were broadly distributed across the United States (figure 1). In 2010, 1.3 percent of the U.S. population lived in BIP project service areas (figure 2). Across racial and ethnic groups, the share of the population that lived in BIP project service areas was largest for American Indians/Alaska Natives (AIANs), with 4.1 percent of AIANs living in BIP project service areas.²⁶ The share of the White population living in such areas (1.6 percent) was also larger than the national average of 1.3 percent, while the shares were smaller than the national average for all other racial groups. The share of Hispanics living in BIP project service areas was smaller than the share of non-Hispanics living in such areas.

²⁵ Specifically, tracts with Rural-Urban Commuting Area (RUCA) primary codes 1, 2, or 3 were classified as metro tracts; tracts with RUCA primary codes 4, 5, or 6 were classified as micro tracts, and tracts with RUCA primary codes 7 through 10 were classified as small town/rural tracts. Tracts with RUCA primary code 99 had no population in 2010.

²⁶ The race and ethnic categories used in this report are as defined by the Office of Management and Budget and are explained in the box, “Definitions of Race and Ethnic Categories.”

Figure 1

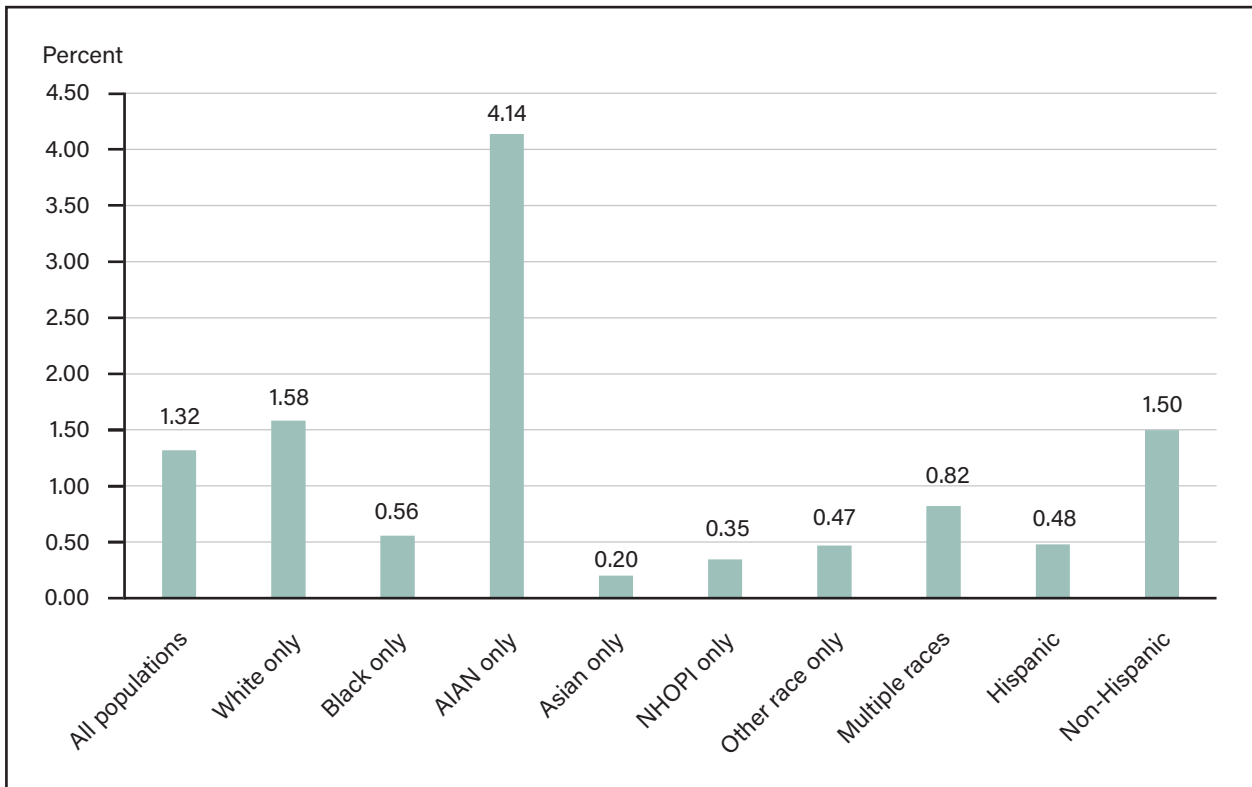
Broadband Initiatives Program project service areas, projects approved in 2010 and completed by 2015



Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service data.

Figure 2

Percent of 2010 U.S. population in Broadband Initiatives Program project service areas, by race and ethnicity



AIAN = American Indian or Alaska Native; NHOPI = Native Hawaiian or Other Pacific Islander.

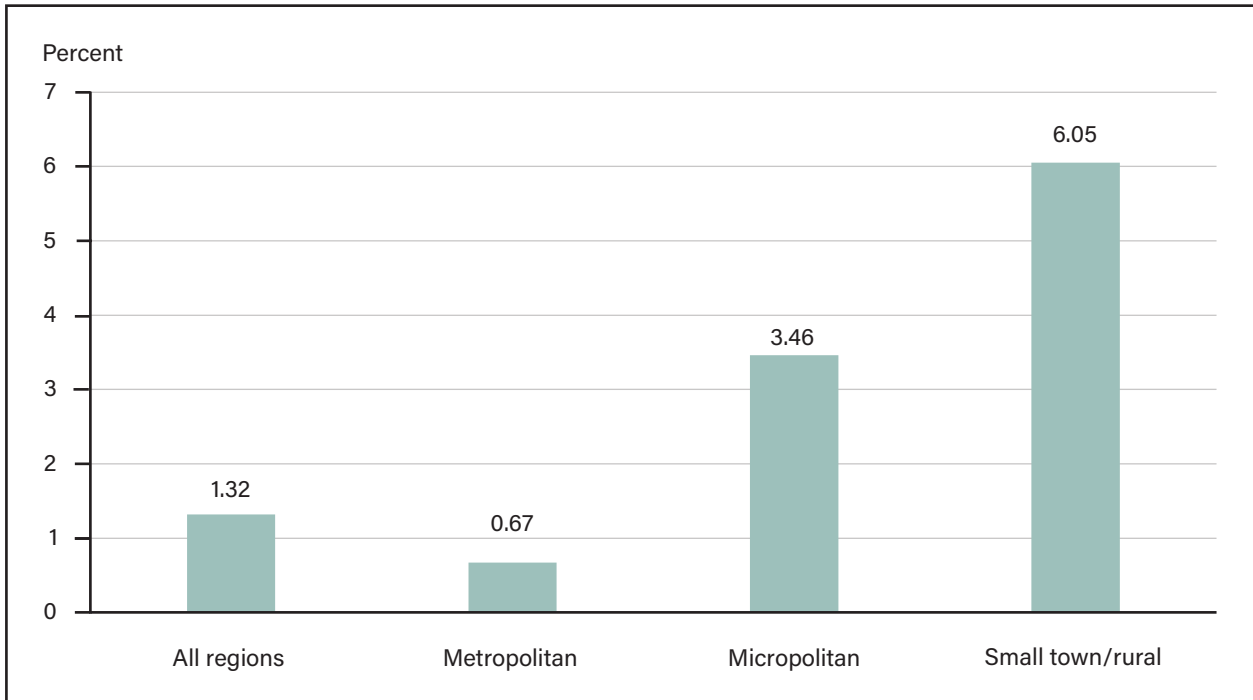
Note: All racial categories refer to populations of any ethnicity (e.g., Hispanic as well as non-Hispanic). Hispanic and non-Hispanic ethnic categories refer to Hispanic populations of any race. In the racial categories, "only" refers to people who are only of one race (e.g., "White only" means a person who is only of the White race and not of multiple races). These race and ethnic categories are classified by the U.S. Census Bureau based on standards set by the Office of Management and Budget (Marks & Rios-Vargas, 2021).

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service and 2010 Population Census data.

Some of the differences in shares of populations in BIP project service areas are likely due to the rural focus of the program, though being a rural area was only required for 75 percent of the area of BIP project service areas. Only 0.7 percent of the population of metro census tracts lived in BIP project service areas in 2010, compared to 3.5 percent of the population of micro tracts and 6.1 percent of the population of small town and rural tracts (figure 3). Since AIANs, Whites, and non-Hispanics are a larger share of the population in micro, small town, and rural tracts than in metro areas, the targeting of the BIP to these areas helps explain greater shares of these racial and ethnic groups in BIP project service areas. However, even within the metro, micro, and small town/rural tracts, larger shares of AIANs and Whites than of other races lived in BIP project service areas, and a larger share of non-Hispanics than Hispanics lived in such areas.

Figure 3

Percent of 2010 U.S. population in Broadband Initiatives Program project service areas by geographic type of census tract



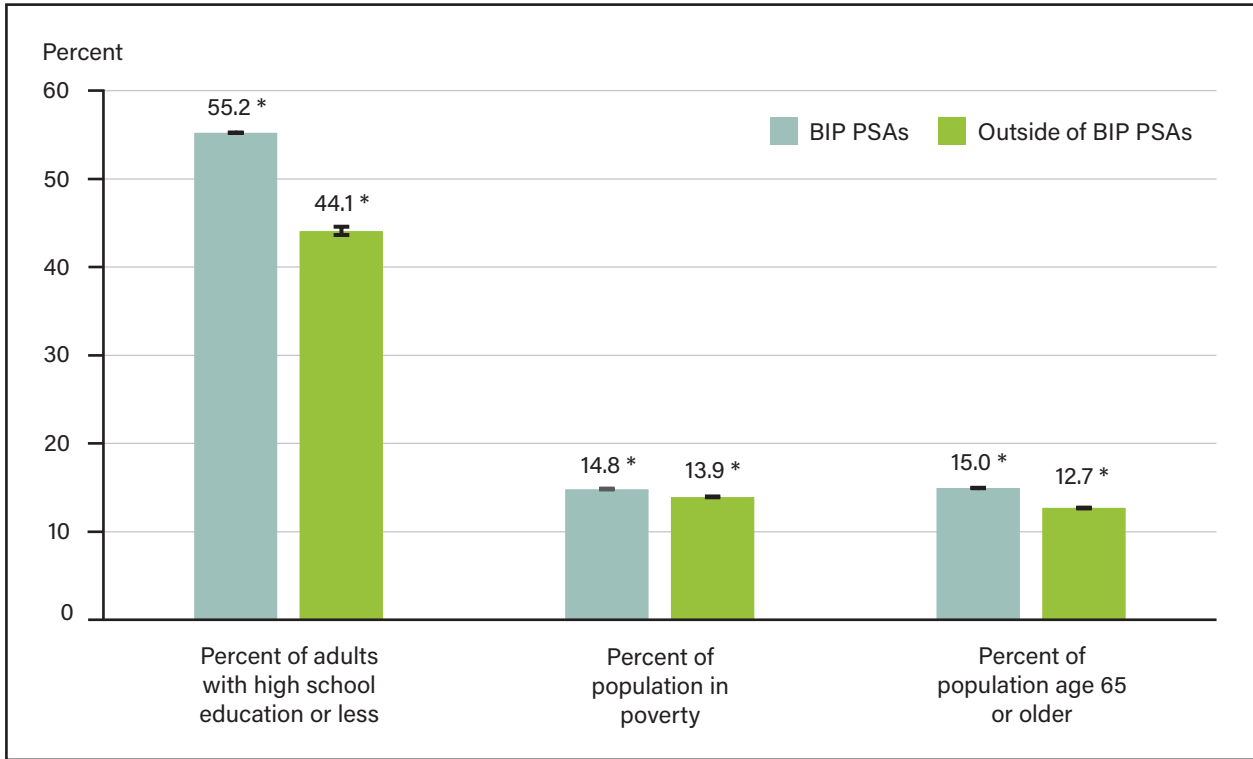
Note: Census tracts with Rural-Urban Commuting Area (RUCA) codes of 1, 2, or 3 are classified as metropolitan; tracts with RUCA codes of 4, 5, or 6 are classified as micropolitan; and tracts with RUCA codes of 7, 8, 9, or 10 are classified as small town/rural.

Source: USDA, Economic Research Service (ERS) analysis of USDA, Rural Utilities Service and 2010 Population Census data and USDA, ERS 2010 Rural-Urban Commuting Area codes.

Consistent with the rural focus of the BIP, the people living in BIP project service areas in 2010 were, on average, less educated (had a larger share with only a high school diploma or less), more likely to be poor, and older (had a greater share aged 65 or older) than the people living outside of BIP project service areas (figure 4).

Figure 4

Characteristics of populations in and outside of Broadband Initiatives Program project service areas, 2006-10



BIP = Broadband Initiatives Program; PSA = project service area.

Note: 95-percent confidence intervals, depicted by horizontal bars connected by a vertical line (I), indicate all demographic differences between areas inside BIP PSAs and outside these areas are statistically significant (asterisk denotes $p < 0.05$). Confidence intervals were estimated using the formulas for standard errors and margins of error in U.S. Census Bureau (2020).

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service and 2006-10 American Community Survey data.

Comparisons between populations of BIP project service areas and the rest of the population are limited in their usefulness in assessing how well different populations were served by the program since many of the non-BIP areas included in the analysis may not have been eligible for the program. In the analysis of the areas and populations served by the Community Connect and ReConnect programs, the authors were able to address this issue since estimates are available of the population of eligible areas as well as areas served by these programs.

Definitions of Race and Ethnic Categories in this Report¹

The authors use the definitions of race and ethnic categories employed by the Census Bureau according to standards set by the Office of Management and Budget.

Race categories

- “White” refers to a person having origins in any of the original peoples of Europe, the Middle East, or North Africa. It includes people who indicated their race(s) as “White” or reported entries such as Irish, German, English, Italian, Lebanese, Egyptian, Arab, Moroccan, or Caucasian.
- “Black or African American” refers to a person having origins in any of the Black racial groups of Africa. It includes people who indicated their race(s) as “Black or African Am.” or reported entries such as African American, Jamaican, Haitian, Nigerian, Ethiopian, Kenyan, or Somali.
- “American Indian or Alaska Native” refers to a person having origins in any of the original peoples of North and South America (including Central America) and who maintains Tribal affiliation or community attachment. This category includes people who indicated their race(s) as “American Indian or Alaska Native” or reported their enrolled or principal Tribe, such as Navajo Nation, Blackfeet Tribe, Inupiat, Yup’ik, or Central American Indian groups or South American Indian groups.
- “Asian” refers to a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent, including, for example, from Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam. It includes people who indicated their race(s) as “Asian” or reported entries such as “Asian Indian,” “Chinese,” “Filipino,” “Korean,” “Japanese,” “Vietnamese,” and “Other Asian,” or who provided other detailed Asian responses.
- “Native Hawaiian or Other Pacific Islander” refers to a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands. It includes people who indicated their race(s) as “Pacific Islander” or reported entries such as “Native Hawaiian,” “Chamorro,” “Samoan,” and “Other Pacific Islander” or provided other detailed Pacific Islander responses.
- “Other Race” includes all other responses not included in the White, Black, or African American, American Indian or Alaska Native, Asian, and Native Hawaiian, or Other Pacific Islander race categories described above. Respondents reporting entries such as multiracial, mixed, interracial, or Hispanic or Latino group (for example, Mexican, Puerto Rican, Cuban, or Spanish) in response to the race question are included in this category.

Ethnicity

- “Hispanic or Latino” refers to a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.
- “Non-Hispanic” refers to anyone not classified as Hispanic or Latino.

¹ Adapted from Humes et al. (2011) and Marks and Rios-Vargas (2021). Some changes in the wording of the census questionnaire and how written responses to these questions were coded occurred between the 2010 and 2020 Population Census, as explained by Marks and Rios-Vargas (2021).

Community Connect Grant Program

The Community Connect Grant (CCG) program serves a much smaller share of the area and population of the United States than the BIP (figure 5). Only 0.6 percent of the U.S. population resided in areas eligible for the Community Connect program in December 2020 (figure 6).²⁷ Of those in eligible areas, only 2.2 percent lived in project service areas of Community Connect projects approved in FY 2018 to 2021.²⁸ Combined, these figures imply that only 0.013 percent of the U.S. population in 2020 lived in project service areas of Community Connect projects approved in FY 2018 to 2021,²⁹ i.e., about 1 percent the size of the population living in BIP project service areas in 2010.

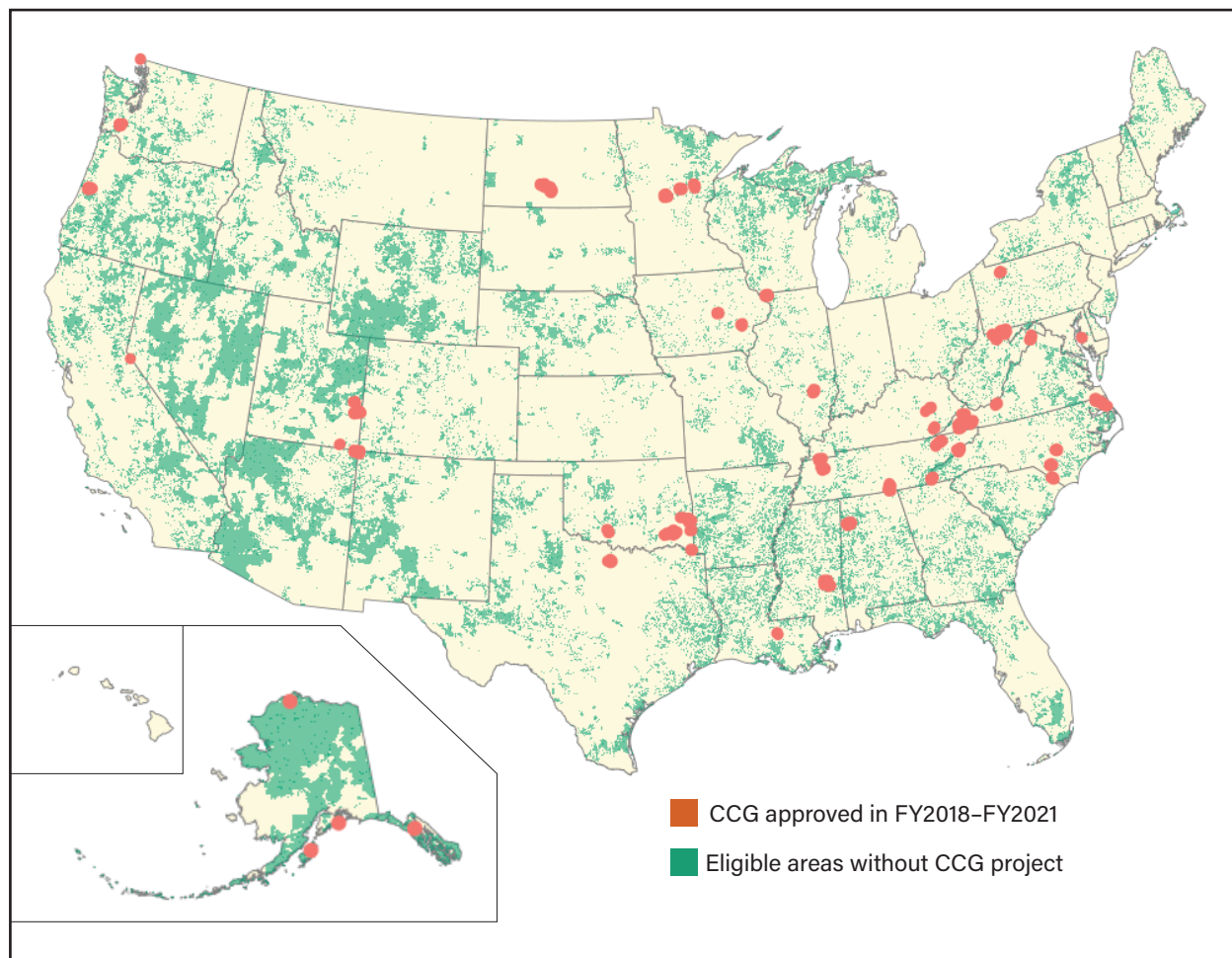
²⁷ As explained in the box, “Mapping Eligible Areas for Community Connect and ReConnect” (p. 17–18), eligible areas for Community Connect were estimated using Federal Communications Commission (FCC) broadband availability data for December 31, 2020, which results in a conservative estimate of the area and population eligible for the program prior to this date because of increases in broadband availability over time. Using FCC broadband availability data for December 31, 2018, instead of FCC data for December 31, 2020, to classify eligible areas, the authors estimated that 1.4 percent of the 2020 U.S. population resided in areas eligible for Community Connect in December 2018 (appendix figure A1). Comparing appendix figure A.1 to figure 6 reveals how general broadband expansion between 2018 and 2020 may have reduced eligible population shares in later years of the program and how the share of the eligible population in approved Community Connect project service areas increased over the same period due to the decline in areas that were eligible.

²⁸ Using instead FCC broadband availability data for December 31, 2018, to classify eligible areas, the authors estimated that 0.9 percent of the population eligible in December 2018 resided in service areas of Community Connect projects approved in FY 2018–21 (appendix figure A.1).

²⁹ This estimate of the share of the U.S. population in approved Community Connect project service areas equals the product of the share of the total population in eligible areas and the share of the eligible population in Community Connect project service areas. Mathematically, this estimate is unaffected by changes in the estimate of the population eligible for the program. Thus, if a larger share of the population is estimated to be eligible based on FCC data for an earlier date, the product of these two shares is unchanged.

Figure 5

U.S. areas eligible and approved for Community Connect project service areas, FY 2018–FY 2021



CCG = Community Connect Grant; FY = fiscal year.

Note: Eligibility was determined using Federal Communications Commission data for December 31, 2020.

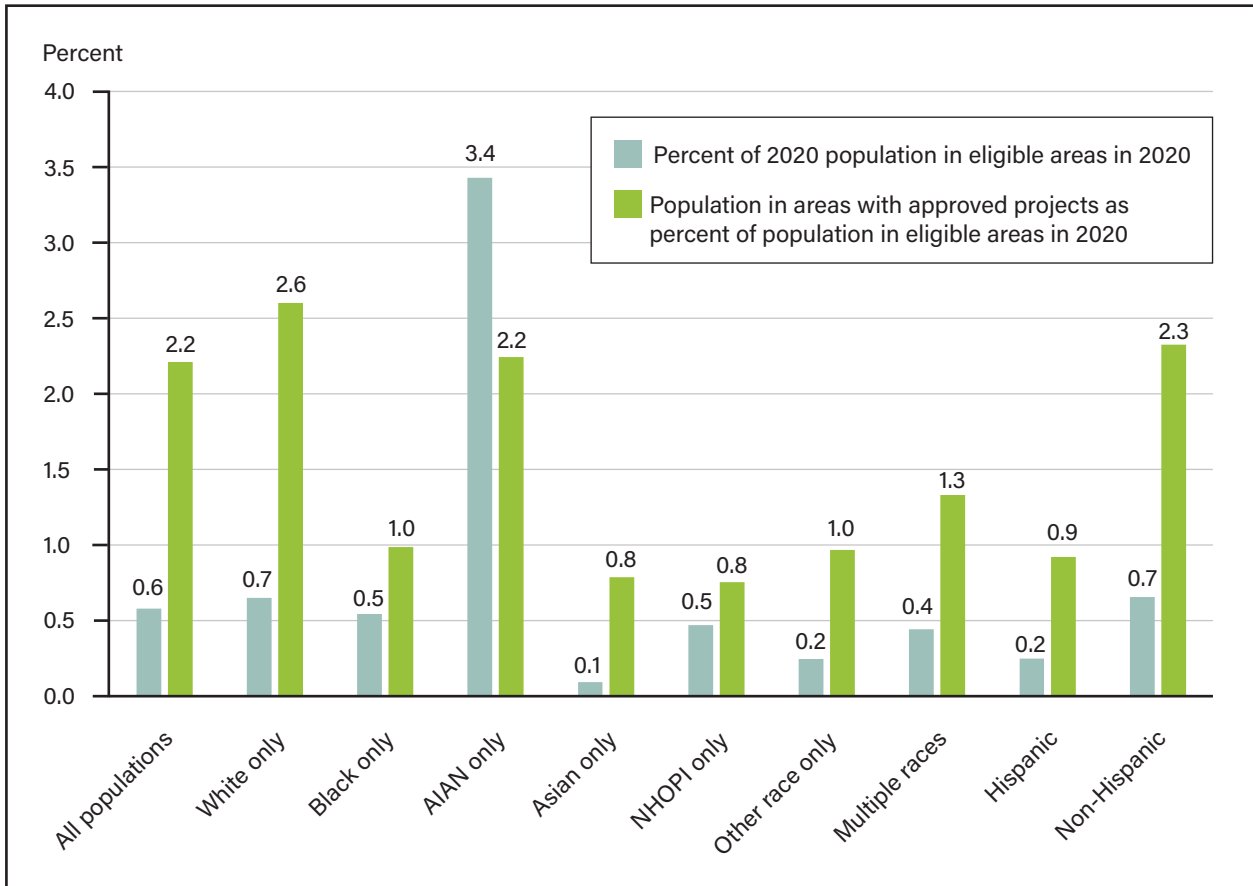
Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service and Federal Communications Commission data.

Across racial groups, a much larger share of AIANs (3.4 percent) than other races lived in areas eligible for Community Connect in 2020.³⁰ Whites and Blacks were somewhat more likely than other races (besides AIANs) to live in eligible areas, while Asians were least likely to live in such areas (figure 6). Non-Hispanics were more likely than Hispanics to live in areas eligible for Community Connect. Among those living in eligible areas, AIANs and Whites were most likely to live in project service areas of Community Connect projects approved in FY 2018 to 2021, and Hispanics were less likely than non-Hispanics to live in these areas.

³⁰ Using FCC broadband availability data for December 31, 2018, to classify eligible areas, the authors estimated that 5.1 percent of the 2020 AIAN population resided in areas eligible for CCG in December 2018 (appendix figure A.1). All the qualitative comparisons among racial and ethnic groups stated in this paragraph hold when using these earlier FCC data to classify eligibility.

Figure 6

Percent of 2020 population in areas eligible for Community Connect Grants in 2020 and percent of eligible population in project service areas approved in FY 2018–21, by race and ethnicity



AIAN = American Indian or Alaska Native; FY = fiscal year; NHOPi = Native Hawaiian or Other Pacific Islander.

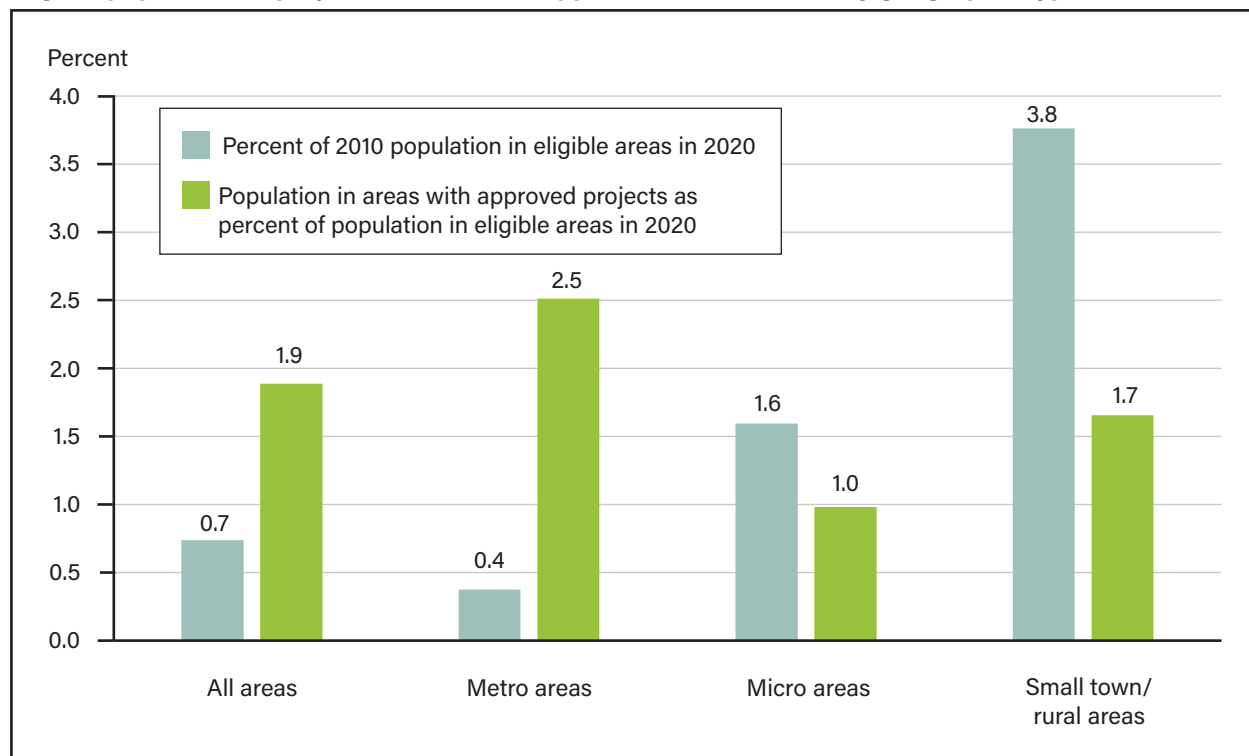
Note: Eligibility was determined using Federal Communications Commission data for December 31, 2020. All racial categories refer to populations of any ethnicity (e.g., Hispanic as well as non-Hispanic). Hispanic and non-Hispanic ethnic categories refer to Hispanic populations of any race. These race and ethnic categories are classified by the U.S. Census Bureau based on standards set by the Office of Management and Budget (Marks & Rios-Vargas, 2021).

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service, Federal Communications Commission, and 2020 Population Census data.

Not surprisingly, given the requirement that only rural areas (as defined by the program) are eligible for Community Connect, much larger shares of the population of micro, small town, and rural tracts lived in areas eligible for Community Connect than the share of the population of metro tracts (figure 7).³¹ However, among the populations of areas eligible for Community Connect, a larger share of those in metro tracts lived in a PSA of a Community Connect project approved during FY 2018 to 2021 than the shares of eligible populations in micro or small town/rural tracts that lived in a PSA of a Community Connect project approved during this period. This suggests that rural communities closer to large urban centers (such as those in metro census tracts) may have some advantages over more remote rural communities in successfully applying for a Community Connect grant.

Figure 7

Percent of 2010 population in areas eligible for Community Connect Grants in 2020 and percent of eligible population in project service areas approved in FY 2018-21, by geographic type



FY = fiscal year

Note: Eligibility was determined using Federal Communications Commission data for December 31, 2020. Census tracts with Rural-Urban Commuting Area (RUCA) codes of 1, 2, or 3 are classified as metropolitan; tracts with RUCA codes of 4, 5, or 6 are classified as micropolitan; and tracts with RUCA codes of 7, 8, 9, or 10 are classified as small town/rural. Population shares were computed using 2010 Population Census data because RUCA codes based on 2020 Population Census data were unavailable.

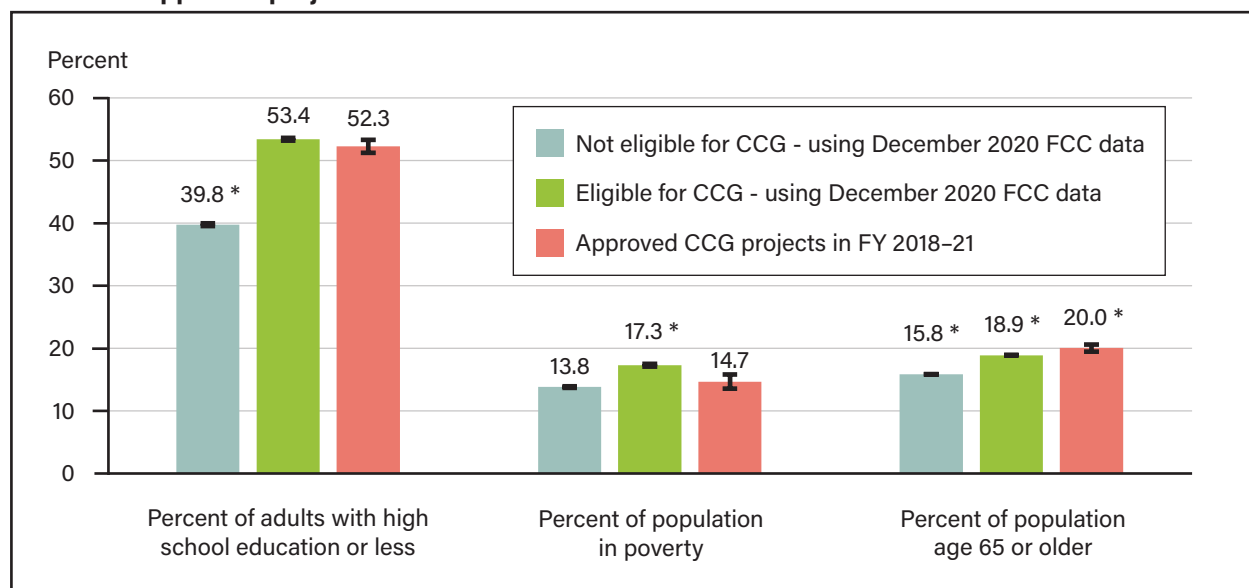
Source: USDA, Economic Research Service (ERS) analysis of USDA, Rural Utilities Service, Federal Communications Commission, 2010 Population Census data, and USDA, ERS 2010 Rural-Urban Commuting Area codes.

³¹ All the qualitative comparisons in this paragraph among metropolitan, micropolitan, and small town/rural areas also hold when Federal Communications Commission (FCC) data on broadband availability on December 31, 2018, were used to classify eligible areas (appendix figure A.2).

As with the population in BIP project service areas, people who live in areas eligible for Community Connect or in approved Community Connect PSAs tend to be less educated, poorer, and older, on average, than people in areas ineligible for the program (figure 8).³² Compared to the eligible population not living in approved Community Connect PSAs, the population in approved Community Connect PSAs was somewhat older and not as poor.

Figure 8

Population characteristics of Community Connect Grant-ineligible areas in 2020, eligible areas, and areas with approved projects in FY 2018-21



CCG = Community Connect Grant. FY = fiscal year.

* = Asterisks denote which differences between subgroups are statistically significant (p<0.05).

Note: Eligibility was determined using Federal Communications Commission (FCC) data for December 31, 2020. 95-percent confidence intervals are shown with horizontal lines connected by a vertical line (I). Differences in the share of adults with high school education or less between areas not eligible for CCG and the other two categories are statistically significant. Differences in the share of population in poverty between eligible areas and the other two categories are statistically significant. All differences in the share of population age 65 or older across the three categories are statistically significant. Standard errors and confidence intervals were estimated using the American Community Survey (ACS) Variance Replicate Estimate Tables for the 2015-19 ACS.

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service, Federal Communications Commission, and 2015-19 American Community Survey data.

Although the available information on eligibility for the Community Connect program increases the usefulness of comparisons between the populations in approved Community Connect PSAs and the populations of other (eligible versus ineligible) areas, we lack useful information on the populations of areas proposed for service by Community Connect whose applications were not approved. We have such information for the ReConnect Program.

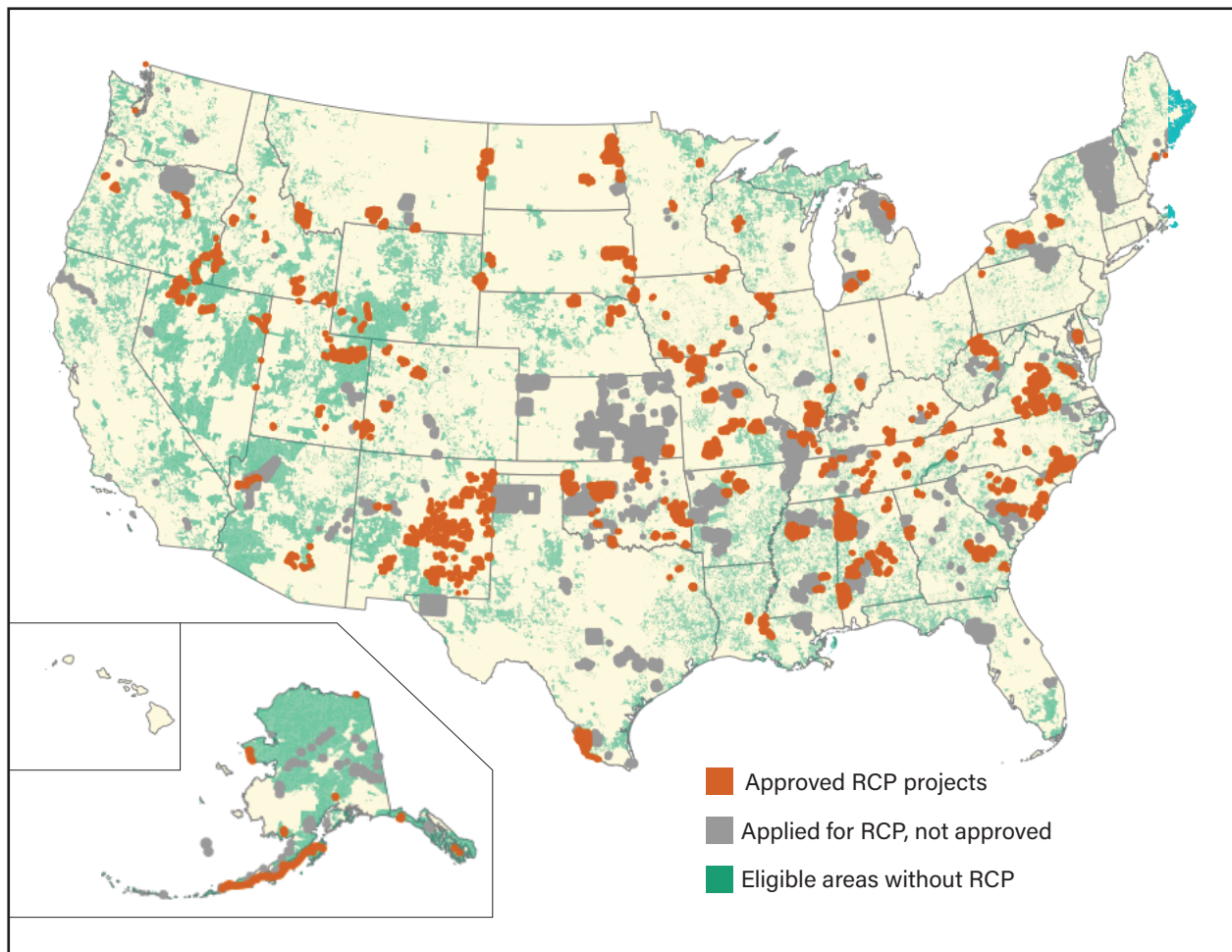
ReConnect Program

The areas eligible for ReConnect and Community Connect are similar but ReConnect has a much broader reach than Community Connect in terms of area in approved PSAs (figure 9). As mentioned, the population

³² All the qualitative comparisons in this paragraph also hold when FCC data on broadband availability on December 31, 2018, were used to classify eligible areas (appendix figure A.3).

eligible for ReConnect was conservatively estimated to be the same as that eligible for Community Connect in 2020: 0.6 percent of the U.S. population.³³ About 21 percent of the eligible population lived in PSAs of ReConnect projects approved in the first two funding rounds (figure 10).³⁴ Combined, these figures indicate that 0.12 percent of the U.S. population in 2020 lived in ReConnect PSAs approved in the first two rounds; about nine times greater than the size of the Community Connect program in FY 2018 to FY 2021 but less than 10 percent of the size of the BIP in terms of the share of the population reached through FY 2021 by this program.

Figure 9
U.S. areas eligible for ReConnect and areas with ReConnect approved and unapproved project applications in FY 2019 and FY 2020



FY = fiscal year; RCP = ReConnect Program

Note: Eligibility was determined using Federal Communications Commission data for December 31, 2020.

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service and Federal Communications Commission data.

³³ Using Federal Communications Commission (FCC) broadband availability data for December 31, 2018, to classify eligible areas, the authors estimated that 1.4 percent of the population was eligible for Community Connect and ReConnect on this date (appendix figure A.1). This estimate is based on areas completely lacking broadband service, as defined in the first two funding rounds of ReConnect, ignoring the fact that areas in which 90 percent of the households lacking broadband service were eligible. The population eligible for ReConnect could be about 1.11 times larger than our estimate ($100/90 = 1.11$) because of this factor. This still ignores other factors causing our estimate of the eligible population to be conservative, such as the fact that FCC Form 477 data may overestimate actual availability and would therefore contribute to an underestimate of eligible unserved areas.

³⁴ Using FCC broadband availability data for December 31, 2018, the authors estimated that 9 percent of the eligible population in December 2018 lived in PSAs of ReConnect projects approved in the first two funding rounds (appendix figure A.4). As explained in footnote 29, a larger estimate of the share of the total population that is eligible (due to using FCC data for December 2018 rather than December 2020 to estimate eligible areas) implies a smaller estimate of the share of the eligible population in approved PSAs (of ReConnect projects in this case).

About 0.5 percent of the 2020 U.S. population lived in areas proposed to be funded by ReConnect project applications during the first two rounds of funding. The size of this population was about 84 percent of the size of the eligible population (figure 10).³⁵ ³⁶ As a share of the eligible population in 2020, a smaller percentage of AIANs (37 percent) and Native Hawaiians/Other Pacific Islanders (NHOPIs, 36 percent) than other racial groups lived in areas with ReConnect applications in the first two funding rounds (figure 10).³⁷ Hispanics were more likely than non-Hispanics to live in such areas.

A larger share of eligible Whites and Blacks than eligible people of other races lived in areas with approved applications, and a larger share of eligible non-Hispanics than eligible Hispanics lived in areas with approved applications. Across races, AIANs and NHOPIs had the smallest share of their eligible population living in areas with approved applications (10 percent and 11 percent, respectively). Among the populations in areas with ReConnect applications, the share in areas with approved project service areas was higher for NHOPIs (33 percent), Blacks (30 percent), and AIANs (27 percent) than for Whites (24 percent) and other racial groups. Thus, the low share of AIANs and NHOPIs in approved areas among those in eligible areas resulted from a smaller share of these populations in areas with ReConnect applications and not because the applications for areas with AIAN and NHOPI residents were less likely to be approved.

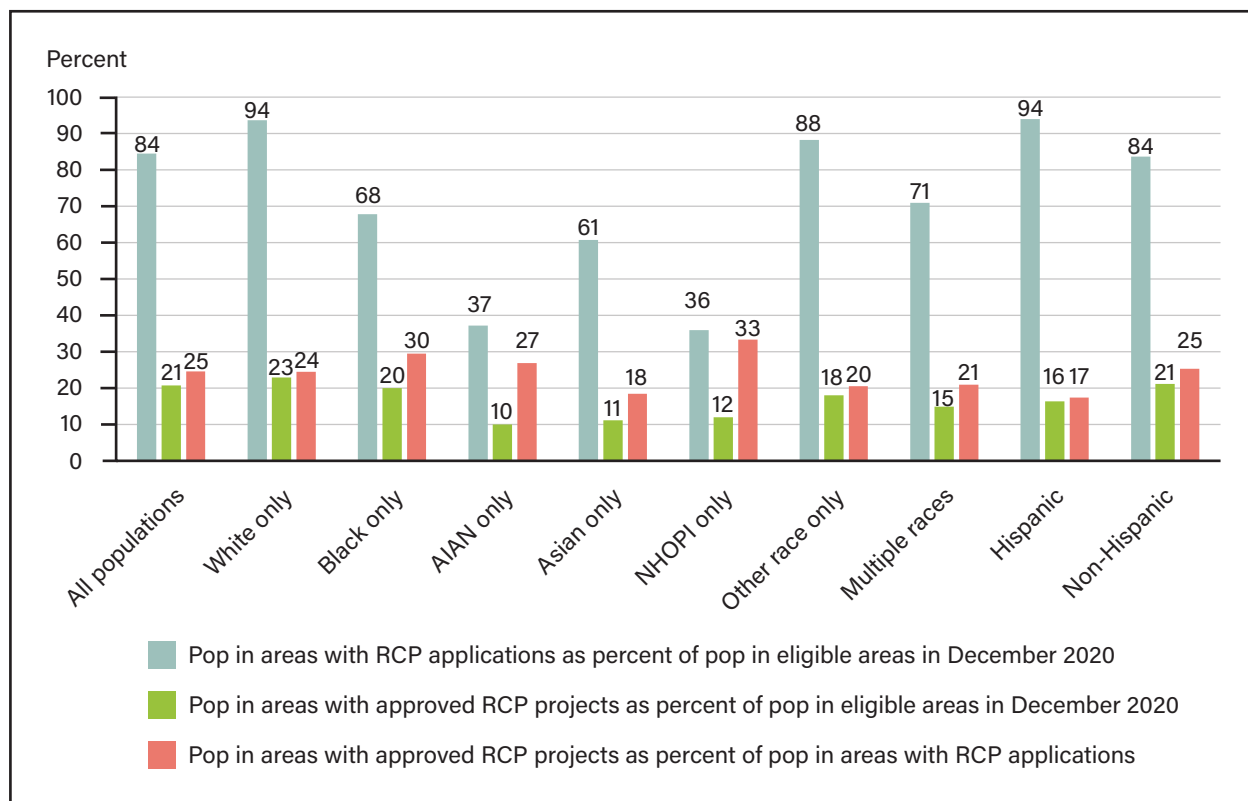
³⁵ The estimates in figures 10 and 11 of the “pop in areas (pop = population) with ReConnect applications as a percent of pop in eligible areas” do not assume that all areas proposed to be served by ReConnect applications were eligible for the program. Thus, these percentages can be greater than 100, as shown in figure 11 for micro areas.

³⁶ Using FCC broadband availability data for December 31, 2018, to classify eligible areas, 36 percent of the eligible population in December 2018 resided in areas with ReConnect Program applications in the first two funding rounds (appendix figure A.4).

³⁷ The qualitative statements in this and the next paragraph comparing shares of the eligible population in areas with ReConnect applications and shares with approved ReConnect projects among different racial and ethnic populations also hold using Federal Communications Commission broadband availability data for December 31, 2018, to classify eligibility (appendix figure A.4).

Figure 10

Population in areas with ReConnect applications and approved projects as a percent of 2020 eligible population, and population with approved projects as a percent of population with applications in FY 2019-20, by race and ethnicity



AIAN = American Indian or Alaska Native; FY = fiscal year; NHOPI = Native Hawaiian or Other Pacific Islander; Pop = population; RCP = ReConnect Program.

Note: Eligibility was determined using Federal Communications Commission (FCC) data for December 31, 2020. All racial categories refer to populations of any ethnicity (e.g., Hispanic as well as non-Hispanic). Hispanic and non-Hispanic ethnic categories refer to Hispanic populations of any race. These race and ethnic categories are classified by the U.S. Census Bureau based on standards set by the Office of Management and Budget (Marks & Rios-Vargas, 2021). The estimates of the “Pop in areas with RCP applications as a percent of pop in eligible areas in December 2020” do not assume that all areas proposed to be served by RCP applications were eligible for the program.

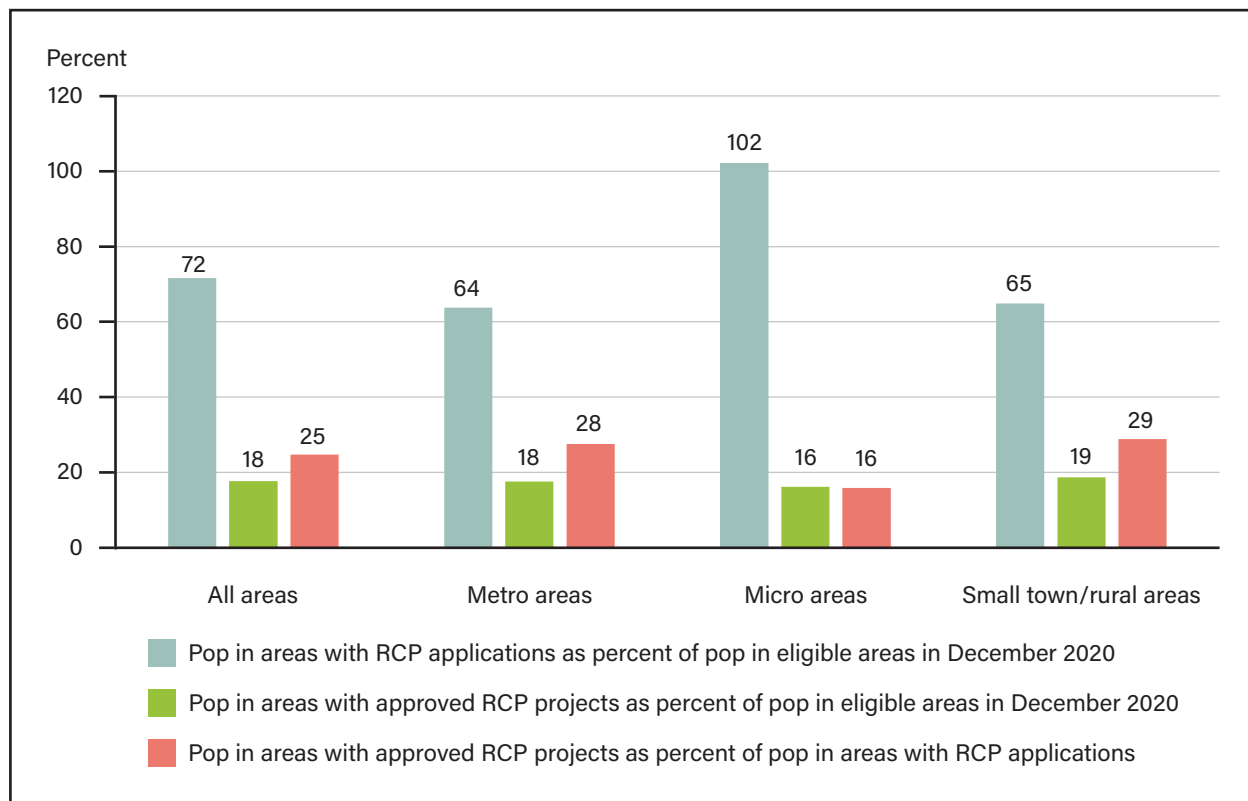
Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service, Federal Communications Commission, and 2020 Population Census data.

Although the share of the population eligible for ReConnect (as for Community Connect) is greatest in small town and rural areas (as shown for Community Connect in figure 7), the greatest share of the population in areas with ReConnect applications as a percentage of the eligible population was in micro areas, and this share was similar in metro and small town/rural areas (figure 11).³⁸ But in micro areas, a smaller share of the eligible population and of the population in areas with applications was in areas with approved ReConnect project service areas than the comparable shares in metro or small town/rural tracts. Thus, while ReConnect applications proposed to serve a larger share of the population of micro areas than metro or small town/rural areas, the applications did not result in a larger share of the eligible population being served by approved ReConnect projects in micro areas than in other areas.

³⁸ All the qualitative comparisons among metro, micro, and small town/rural areas stated in this paragraph are robust when using FCC broadband availability data for December 31, 2018, to classify eligibility (appendix figure A.5).

Figure 11

Population in areas with ReConnect applications and approved projects as a percent of 2020 eligible population, and population with approved projects as a percent of population with applications in FY 2019-20, by geographic type



FY = fiscal year; Pop = population; RCP = ReConnect Program.

Note: Eligibility was determined using Federal Communications Commission data for December 31, 2020. Census tracts with Rural-Urban Commuting Area (RUCA) codes of 1, 2, or 3 are classified as metropolitan; tracts with RUCA codes of 4, 5, or 6 are classified as micropolitan; and tracts with RUCA codes of 7, 8, 9, or 10 are classified as small town/rural. Population shares were computed using 2010 Population Census data because RUCA codes based on 2020 Population Census data were unavailable. The estimates of the “Pop in areas with RCP applications as a percent of pop in eligible areas in December 2020” do not assume that all areas proposed to be served by RCP applications were eligible for the program. Thus, these percentages could be greater than 100.

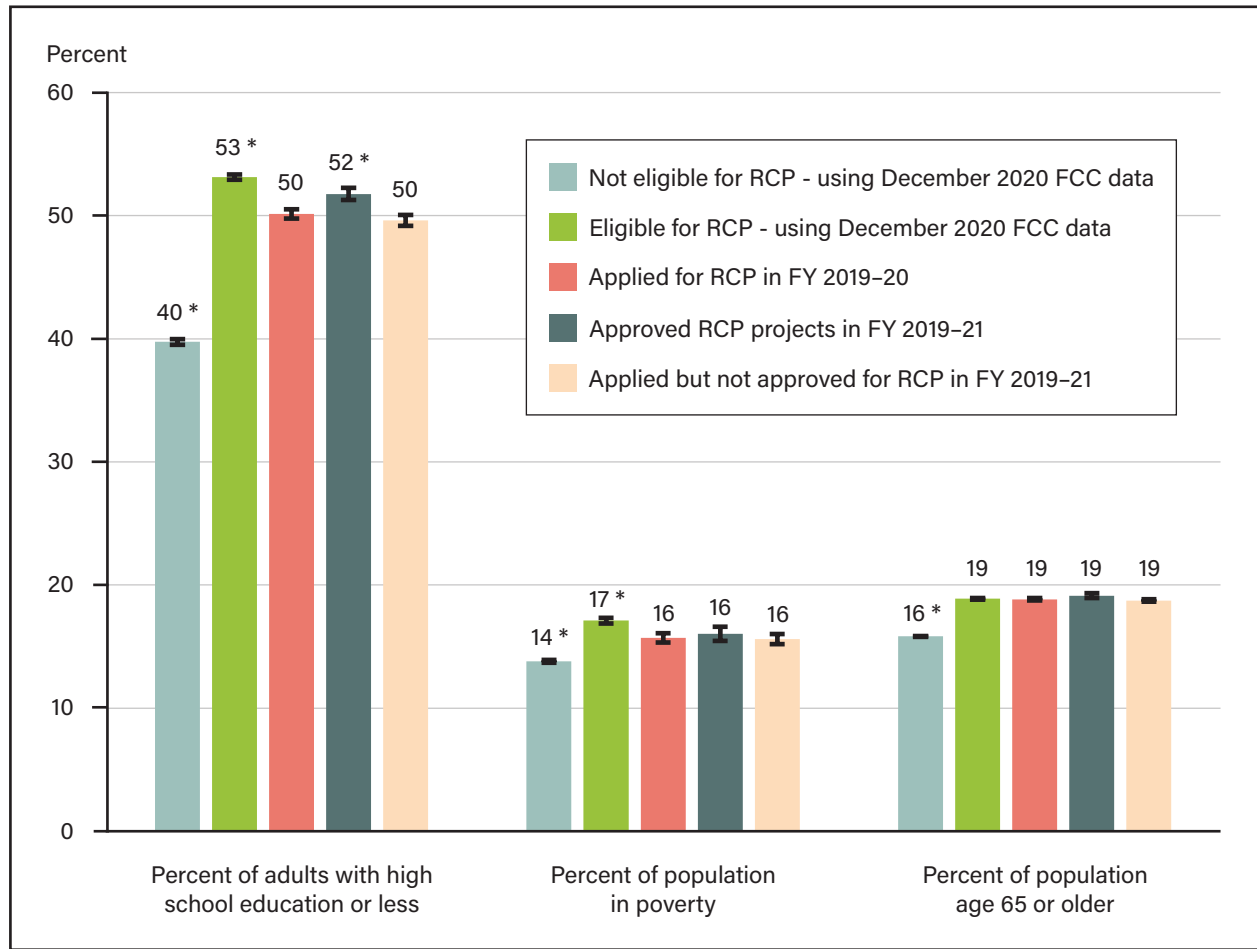
Source: USDA, Economic Research Service (ERS) analysis of USDA, Rural Utilities Service, Federal Communications Commission, 2010 Population Census data, and USDA, ERS 2010 Rural-Urban Commuting Area codes.

As with Community Connect, the population of areas eligible for ReConnect tended to be less educated, poorer, and older, on average, than the population of areas ineligible for ReConnect (figure 12).³⁹ By contrast, smaller differences in these characteristics are evident among people living in eligible areas, areas proposed to be served by ReConnect applications, and areas with or without approved applications among areas with applications. People in areas with applications (whether approved or not) tend to be somewhat more educated and less poor than those in eligible areas without a ReConnect project application. This suggests that lack of education and poverty may reduce the ability or interest of some eligible communities to apply for ReConnect.

³⁹ All the qualitative comparisons in this paragraph are robust when using Federal Communications Commission data for December 31, 2018, to classify eligible areas (appendix figure A.6).

Figure 12

Population characteristics in 2015–19 of areas not eligible, eligible, with applications, and with/without approved ReConnect Program projects in FY 2019–21



FCC = Federal Communications Commission; FY = fiscal year; RCP = ReConnect Program.

* = denotes which differences between subgroups are statistically significant ($p < 0.05$).

Note: Eligibility was determined using Federal Communications Commission data for December 31, 2020. 95-percent confidence intervals are shown with horizontal lines connected by a vertical line (I). Differences in all statistics between ineligible areas and the other four categories are statistically significant. Other statistically significant differences include differences in the share of adults with a high school education or less between all categories except the difference between all areas with RCP applications and areas with RCP applications that weren't approved, and differences in the share of the population in poverty between areas eligible for RCP and all other categories. Standard errors and confidence intervals were estimated using the American Community Survey Variance Replicate Estimate Tables for the 2015–19 survey.

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service, Federal Communications Commission, and 2015–19 American Community Survey data.

Discussion and Conclusions

In this study, the authors reviewed the history of USDA’s rural broadband programs and the eligibility requirements for three of them: the Broadband Initiatives Program (BIP), Community Connect Grant, and ReConnect. For these three programs, the authors estimated the share of the U.S. population (total and by race/ethnicity and by geographic type of area) that lived in approved project service areas of the programs and selected demographic and socioeconomic characteristics of these populations. The characteristics of populations in the approved project service areas of these programs were compared to the population outside of these areas for the BIP and to the population estimated to be eligible and ineligible for Community Connect and ReConnect. In addition, for ReConnect, we compared population characteristics of areas that had applications to that program that were not approved to those of areas with approved applications.

Summary of Findings and Implications

In terms of funds obligated during the period studied, the BIP was the largest of the three programs. The BIP was also much larger than the other two programs in terms of the population reached by the program. Broadband Initiative Program projects reached 1.3 percent of the 2010 U.S. population living in BIP project service areas, compared to 0.12 percent of the 2020 U.S. population living in project service areas of ReConnect projects approved in the first two rounds of ReConnect funding and 0.013 percent of the 2020 U.S. population living in project service areas of Community Connect projects approved in FY 2018 to FY 2021.

Based on these percentages and the population of the United States in 2010 and 2020, the authors estimate that about 4 million people lived in BIP project service areas in 2010, compared to about 400,000 people living in ReConnect first- and second-round project service areas in 2020 and about 40,000 people in project service areas of Community Connect projects approved in FY 2018 to FY 2021 (table 9). The estimated inflation-adjusted value of obligations per person living in program project service areas was substantially less for the BIP (\$875 per person (in 2020 dollars)) than for Community Connect (\$3,369 per person) or ReConnect (\$3,777 per person). This is partly due to a greater average population density in BIP project service areas than in Community Connect and ReConnect project service areas, probably because the eligibility requirements for the BIP did not as strictly require that the program serve only people in rural areas as did Community Connect and ReConnect. The BIP obligations are also less per square mile of project service area than the obligations of Community Connect or ReConnect per square mile; the obligations per square mile of a project service area are greatest for Community Connect projects. Some of the difference in obligations per square mile between BIP projects and more recent Community Connect and ReConnect projects may be because recent Community Connect and ReConnect projects require much higher broadband speeds than were required by the BIP, which often involves higher-cost technologies such as fiber-to-the-premises.⁴⁰

⁴⁰ Recall that first-round Broadband Initiative Program (BIP) projects required broadband service to be provided at a speed of only 768/200 Kbps, compared to a minimum speed of 25/3 Mbps required by Community Connect projects since 2018 and ReConnect first- and second-round projects, and that a larger share of Community Connect and ReConnect projects than BIP projects supported fiber-to-the-premises.

Table 9

Inflation-adjusted program obligations for Broadband Initiative Program, Community Connect, and ReConnect in approved proposed service areas, FYs 2010, 2018–21

Variable	Unit	BIP FY 2010	Community Connect FY 2018–21	ReConnect FY 2019–21
Obligations	Dollars (million, 2020)	3,565	143	1,502
Population of PSAs	Thousands	4,075	42.5	398
Obligations/person in PSAs	Dollars (per person, 2020)	875	3,369	3,777
Population density of PSAs	Persons/square mile	30.23	24.53	13.40
Obligations/square mile in PSAs	Dollars (per square mile, 2020)	26,451	86,642	50,625

BIP = Broadband Initiatives Program; FY = fiscal year; PSAs = project service area.

Note: Estimates of population and population density for BIP are based on 2010 Population Census data; estimates of population and population density for the Community Connect program and the Reconnect Program are based on 2020 Population Census data. Obligations are adjusted for inflation to 2020 dollars using the Consumer Price Index for all urban consumers.

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service and Population Census data.

All three programs reached (through approved projects) a much larger share of the AIAN population and a larger share of the White population than other racial groups, and a larger share of the non-Hispanic population than of the Hispanic population. All three programs reached a larger share of the population in micro, small town, and rural census tracts than in metro tracts, consistent with the rural focus of these programs. Also consistent with the rural focus, the populations in approved project service areas of these programs were, on average, less educated, poorer, and older than populations not in approved project service areas (for BIP) or areas not eligible for the programs (for Community Connect and ReConnect).

Considering areas that were eligible for Community Connect or ReConnect, the authors find that a much larger share of the population of AIANs than other races lived in areas eligible for these programs. This helps explain the larger share of the AIAN population than of other races that lives in approved project service areas of these programs. A similar reason may also explain the larger share of the AIAN population that lived in BIP project service areas in 2010, though the authors do not have estimates of areas eligible for the BIP to show that conclusively. Although these programs are reaching a larger share of the AIAN population than other racial groups through approved projects, only 10 percent of AIANs living in eligible areas for ReConnect in 2020 were in project service areas approved for ReConnect projects, the lowest percentage for any racial group. The share of the eligible AIAN population being reached by approved ReConnect projects is disproportionately low, despite some of the ReConnect rules in the first two rounds of funding being aimed at promoting the provision of broadband services in Tribal areas, such as scoring ReConnect applications that proposed to serve Tribal areas with additional points and providing concessionary loan terms to projects in Substantially Underserved Trust Areas. The main reason for this appears to be the low percentage of the eligible AIAN population in areas with ReConnect project applications and not because of any tendency for applications serving AIAN populations to be rejected or withdrawn at a greater rate than applications serving other racial groups.

The finding that a low percentage of the AIAN population is in areas with ReConnect applications is consistent with findings of a recent U.S. Government Accountability Office (GAO) report on Tribal broadband

(GAO, 2022b). The GAO (2022b) found that only 5 percent of ReConnect funds awarded in the first two funding rounds (through FY 2020) went to Tribal lands.⁴¹ Based on interviews with Tribal stakeholders and internet service providers, GAO (2022b) identified numerous barriers that inhibit the ability or interest of Tribes and Tribal area providers to participate in Federal broadband programs. Some of these barriers include the large number of these programs, complex eligibility requirements, FCC broadband availability maps that show some unserved Tribal areas with broadband service, program rules that increase the cost of applications without improving the project design, limitations that prevent the use of funds for operating expenses, matching requirements for grants, payment of grant funds on a reimbursement basis rather than in advance, and unique permitting requirements for construction projects on Tribal lands.⁴²

Many of these barriers are not unique to Tribal areas or to the ReConnect program, though GAO (2022b) cited several examples specific to Tribal areas or ReConnect.⁴³ Changes instituted in the third funding round of ReConnect address some of these concerns, including allowing areas receiving FCC support under the Rural Digital Opportunity Fund to be eligible for ReConnect funds (provided the funds are used in a complementary and not duplicative way) and providing up to \$350 million in ReConnect grants to Tribes and Socially Vulnerable Communities without a matching fund requirement. Future research could investigate if these changes resulted in more ReConnect applications proposing to serve Tribal lands. Outreach efforts to better inform Tribes about ReConnect and its requirements might also help to encourage applications from Tribal organizations or providers proposing to serve Tribal lands.

Other racial and ethnic groups for which disproportionately small shares of their eligible population live in ReConnect project service areas include Asians, NHOPIs, people of multiple races, and Hispanics. The situation for NHOPIs is similar to that for AIANs, with a low share of the NHOPI population represented in proposed funded service areas of ReConnect applications rather than a low share of such applications being approved. For Asians and Hispanics, the issue appears to be related to a low share of their populations living in areas with approved applications among areas with a ReConnect application. For such communities, technical assistance may help them overcome deficiencies in project applications.

In the Community Connect program, the authors did not find that a low share of the eligible AIAN population was being reached as they did for ReConnect.⁴⁴ The share of the AIAN eligible population living in project service areas of Community Connect projects approved in FY 2018 to 2021 was about the same as the share for the population as a whole and greater than the share for all other racial groups except Whites. This

⁴¹ By comparison, 20 percent of Community Connect grant funds, 10 percent of Telecommunications Infrastructure Loan funds, 14 percent of Distance Learning and Telemedicine grant funds, and 0 percent of Rural Broadband Access Loan/Loan Guarantee funds went to projects serving Tribal areas in FY 2015–20 (GAO, 2022b, p. 14).

⁴² Several of these and other barriers to the deployment of broadband on Tribal lands were reported to the Federal Communications Commission by the Native Nations Communications Task Force (2019) (and cited by GAO (2022b)), which focused on barriers affecting the ability of Tribes to participate in FCC's broadband programs. Challenges to broadband provision in Tribal areas, in general, have also been discussed in recent literature on the Tribal digital divide (e.g., Bauer et al., 2022; Mack et al., 2022).

⁴³ For example, in the first phase auction of FCC's Rural Digital Opportunity Fund (RDOF), FCC excluded census blocks that had received ReConnect funding from eligibility (GAO (2022b), p. 20), while in the first two rounds of ReConnect, eligibility for ReConnect funds was restricted in areas served by FCC programs (table 5). In another example, stakeholders reported to the U.S. Government Accountability Office (GAO) that ReConnect program rules required Seneca Nation to hire a different engineering company to inspect and certify the broadband construction plans developed by an engineering company under an earlier planning grant provided by the Economic Development Administration, adding costs and time to the project without improving its design (GAO (2022b), pp. 22–23). In a third example, GAO (2022b), p. 23) commented on the ReConnect program rule that prevents program funds from supporting operating expenses, which a broadband provider indicated could make operating a network unprofitable in low-population density Tribal areas even if the network deployment was fully financed. Although stakeholders referred to ReConnect program restrictions in these examples, these restrictions also apply to other Rural Utilities Service broadband programs such as Community Connect grants.

⁴⁴ This finding is consistent with the U.S. Government Accountability Office's finding (2022b, p. 14) that a much larger share of Community Connect grant funds during FY 2015–20 (20 percent) than ReConnect funds during the same period (5 percent) went to projects providing service in Tribal lands.

issue is much more evident for other races besides Whites and AIANs and more evident for Hispanics than non-Hispanics in the Community Connect program. A bigger issue in the Community Connect program may be the low percentage of the eligible population of all racial and ethnic groups reached by the program—ranging from a low of 0.8 percent for Asians and NHOPIs to a high of 2.6 percent for Whites. These low percentages likely reflect the funding limitations of this grant-only program, which puts tight limits on how many projects can be funded and suggests that the program is unlikely to be able to serve a large portion of the eligible population anytime soon at recent levels of funding.

Study Limitations and Directions for Future Research

This study was limited by the inability to estimate areas and populations eligible for the BIP and the lack of data on BIP and Community Connect project applications that were not approved. Data on project eligibility and on project applications that were approved/not approved, such as the Rural Utilities Service (RUS) provided for ReConnect, can enable researchers to identify if differing shares of populations reached by broadband programs are due to differences in eligibility, in propensities of different populations and areas to apply to the programs, or in the likelihood of project applications to be accepted. The finding that the low percentage of eligible AIANs who live in approved project service areas of ReConnect is due to a low propensity for projects proposing to serve AIANs to be included in project applications, and not to a greater tendency for applications to be rejected or withdrawn, is an example of the type of nuanced finding that is possible with more complete data on project applications. Future research on the beneficiaries of these and other broadband programs would benefit from the availability of such data.

Although the authors are able to identify differences in the extent to which USDA broadband programs reached different populations and geographic types of regions, the authors do not know why the propensities to apply for the program or the likelihood that applications are accepted vary across populations and geographies. Further investigation would be needed to understand why such differences exist. Factors that could be investigated, if the necessary data were available or could be collected, include:

- How aware different underserved communities are of the programs,
- Why eligible communities do not apply for specific programs,
- Who prepares project applications,
- What are the costs of preparing applications,
- What are the perceived financial risks of preparing an application that is not accepted, and,
- Why applicants were not able to address the shortcomings identified by the Rural Utilities Service that led applications to be rejected.

Research and outreach efforts to investigate why some populations and areas are not as well represented among project applications and to address causes that may be identified may be fruitful. For example, if it is learned that there is a lack of awareness of the program or a misunderstanding of ReConnect program provisions in some AIAN communities that are reducing the likelihood of these communities to apply to the program, further outreach efforts may be able to address these causes.

For populations that are overrepresented among those proposed to be served by applications that were not approved, such as Asians and Hispanics in the first two rounds of ReConnect funding, investigation of the specific reasons the applications were not approved may reveal issues that could be addressed through

technical assistance, such as inadequacies in project documentation or limited capacity to identify eligible areas. Although the Rural Utilities Service provides an online mapping tool and map data on some eligibility criteria, the data provided do not include information on broadband availability, and applicants must obtain such data from other sources, such as the FCC Form 477 data. Given the large percentage of ReConnect applicants rejected due to the availability of broadband service in the proposed funded service area (especially in the first round), as shown in table 8, the difficulties of applicants in identifying eligible areas appears to be an important issue, even though they appear to have become better at this between the first and second rounds. Technical assistance for applicants whose capacity is limited to use FCC or other sources of data on broadband availability, or improvements in the online mapping tool to incorporate such data, may help address such issues. Research such as that conducted in this study concerning who is served by Federal broadband programs or other rural development programs could be expanded and enhanced if program administrative data were publicly available.

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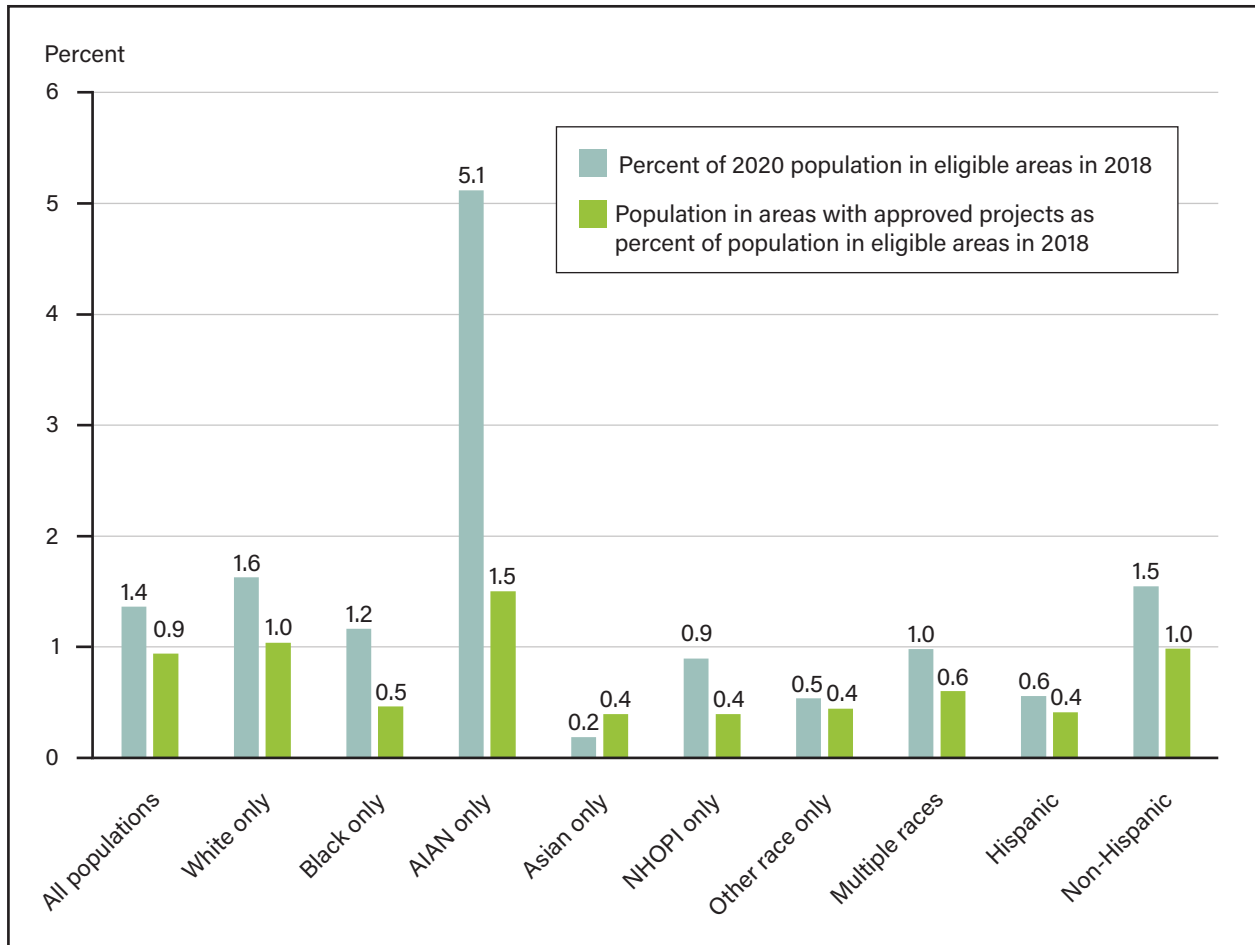
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Appendix: Classifying Eligible Areas for Community Connect and ReConnect Using Federal Communications Commission Data for December 2018

Figure A.1

Percent of 2020 population in areas eligible for Community Connect Grants in 2018 and percent of eligible population in project service areas approved in FY 2018-21, by race and ethnicity



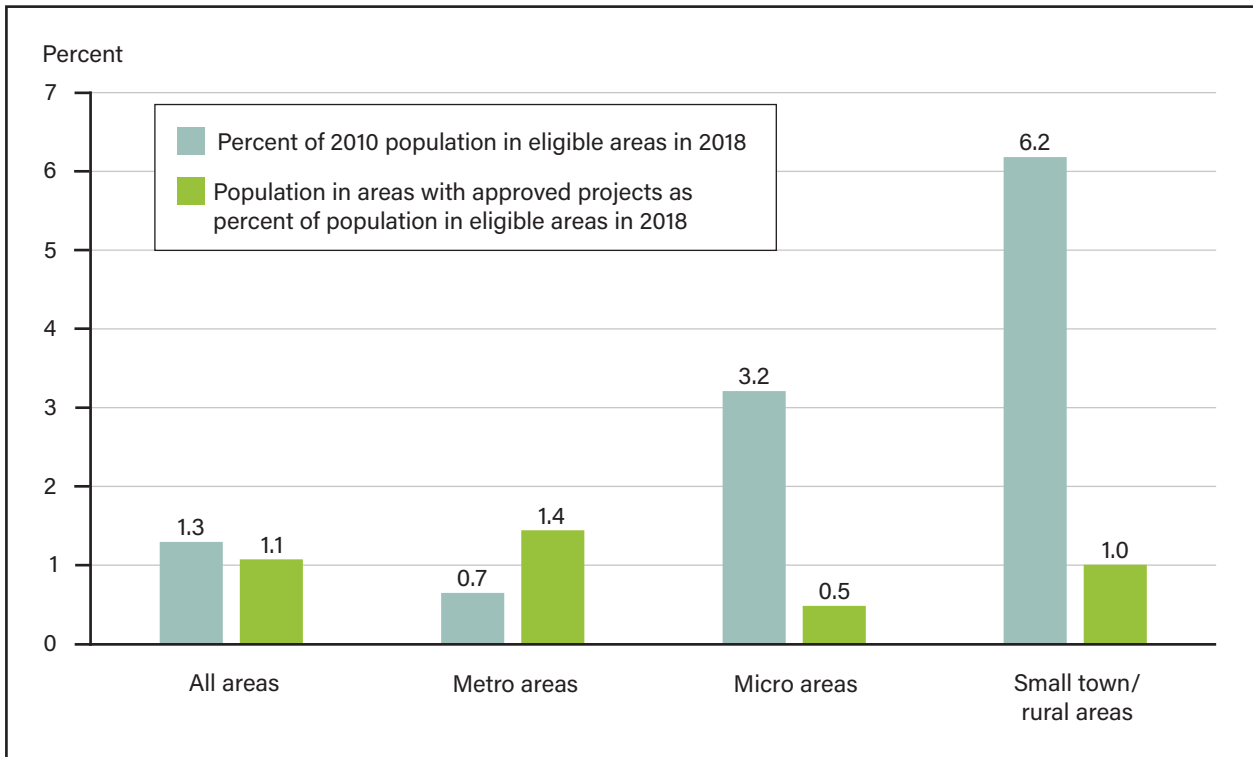
AIAN = American Indian or Alaska Native; FY = fiscal year; NHOPI = Native Hawaiian or Other Pacific Islander.

Note: Eligibility was determined using Federal Communications Commission data for December 31, 2018. All racial categories refer to populations of any ethnicity (e.g., Hispanic as well as non-Hispanic). Hispanic and non-Hispanic ethnic categories refer to Hispanic populations of any race. These race and ethnic categories are classified by the U.S. Census Bureau based on standards set by the Office of Management and Budget (Marks & Rios-Vargas, 2021).

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service, Federal Communications Commission, and 2020 Population Census data.

Figure A.2

Percent of 2010 population in areas eligible for Community Connect Grants in 2018 and percent of eligible population in project service areas approved in FY 2018-21, by geographic type



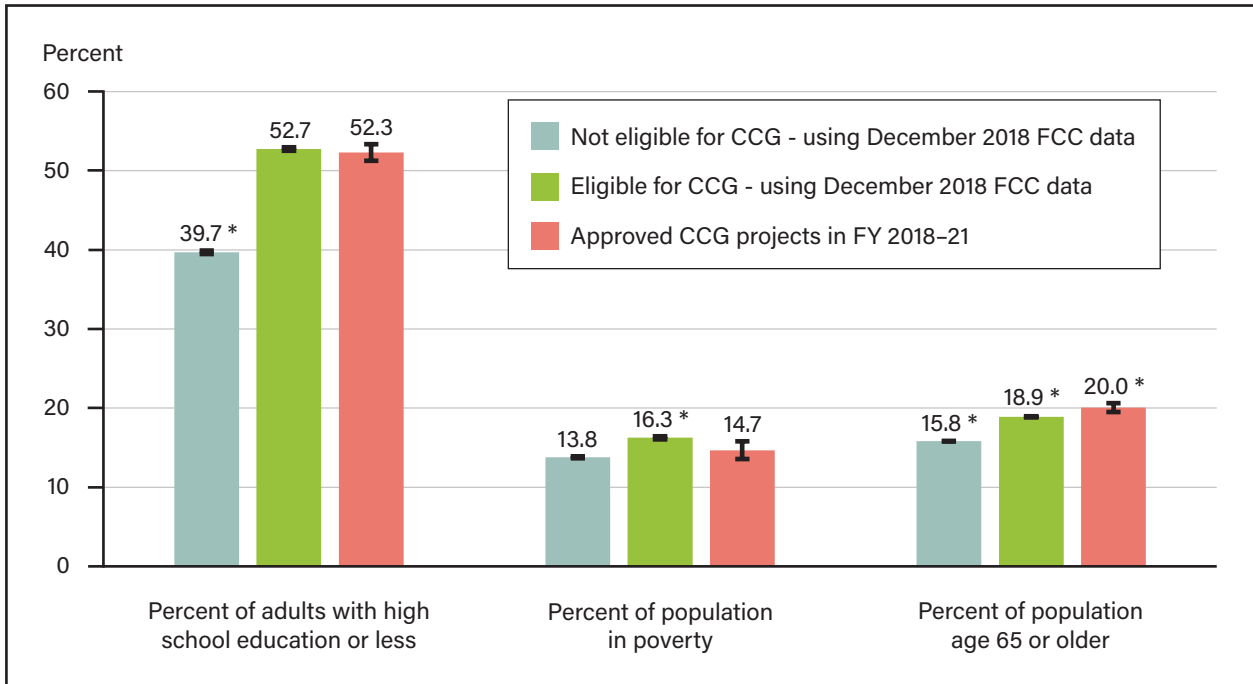
FY = fiscal year.

Note: Eligibility was determined using Federal Communications Commission data for December 31, 2018. Census tracts with Rural-Urban Commuting Area (RUCA) codes of 1, 2, or 3 are classified as metropolitan; tracts with RUCA codes of 4, 5, or 6 are classified as micropolitan; and tracts with RUCA codes of 7, 8, 9, or 10 are classified as small town/rural. Population shares were computed using 2010 Population Census data because RUCA codes based on 2020 Population Census data were unavailable.

Source: USDA, Economic Research Service (ERS) analysis of USDA, Rural Utilities Service, Federal Communications Commission, 2010 Population Census data, and USDA, ERS 2010 Rural-Urban Commuting Area codes.

Figure A.3

Population characteristics in 2015–19 of areas eligible and not eligible for Community Connect Grants in 2018, and areas with approved projects in FY 2018–21



CCG = Community Connect Grant program; FCC = Federal Communications Commission; FY = fiscal year.

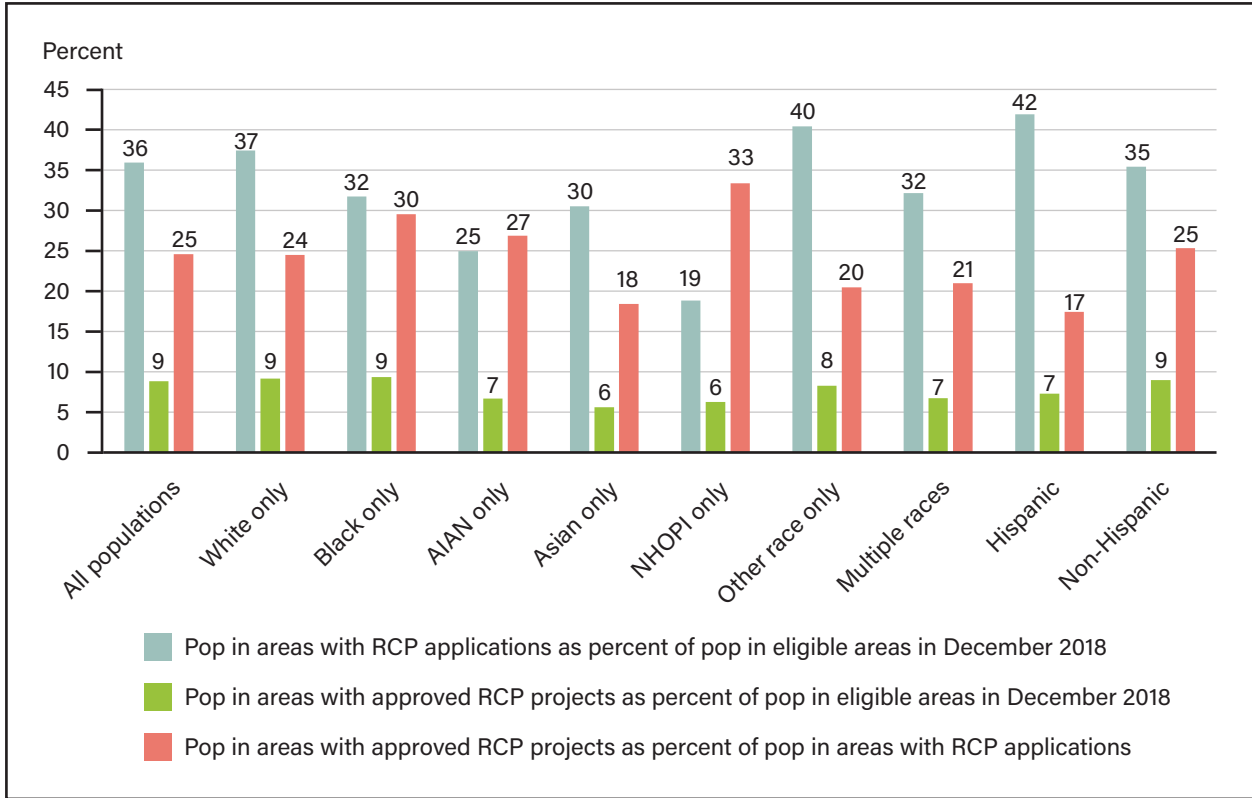
* = denotes which differences between subgroups are statistically significant ($p < 0.05$).

Notes: Eligibility was determined using Federal Communications Commission (FCC) data for December 31, 2018. 95-percent confidence intervals are shown with horizontal lines connected by a vertical line (I). Differences in the share of adults with a high school education or less between areas not eligible for CCG and the other two categories are statistically significant. Differences in the share of population in poverty between eligible areas and the other two categories are statistically significant. All differences in the share of population age 65 or older across the three categories are statistically significant. Standard errors and confidence intervals were estimated using the American Community Survey Variance Replicate Estimate Tables for the 2015–2019 survey.

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service, Federal Communications Commission, and 2015–2019 American Community Survey data.

Figure A.4

Population in areas with ReConnect applications and approved projects as a percent of 2018 eligible population, and population with approved projects as a percent of population with applications in FY 2019–20, by race and ethnicity



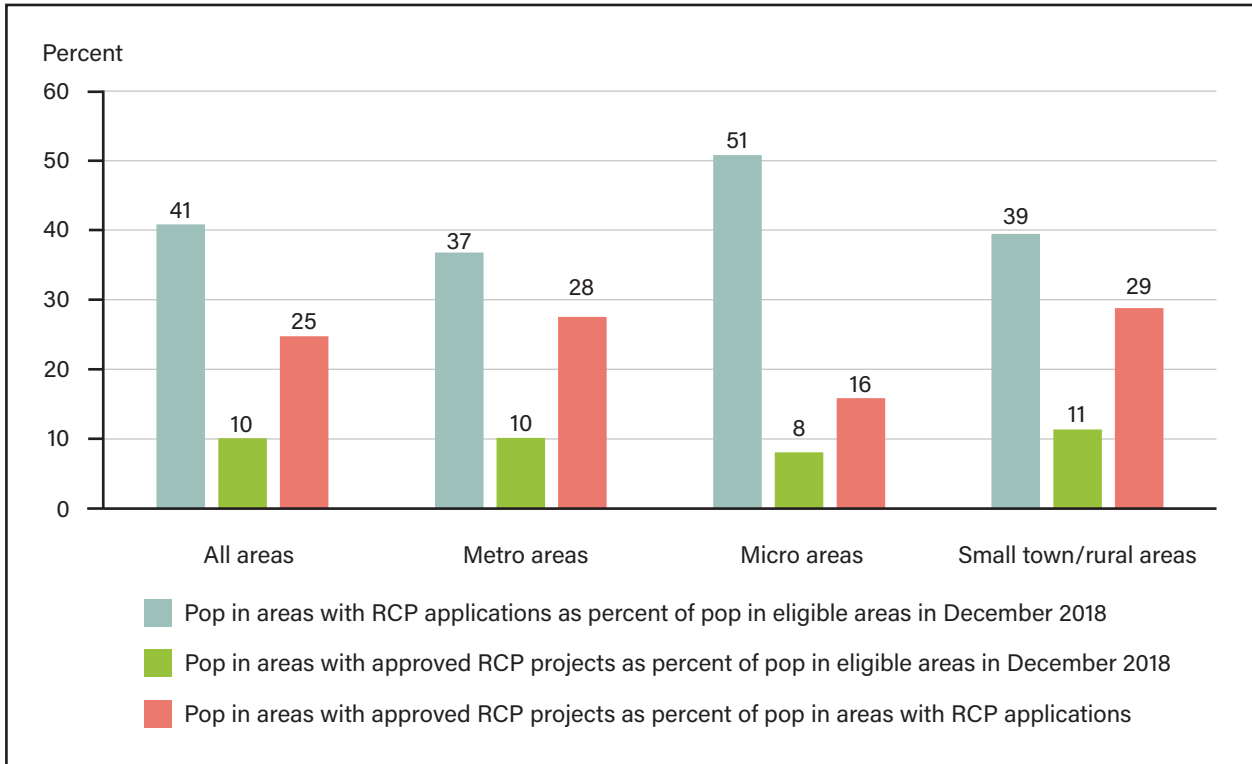
AIAN = American Indian or Alaska Native; FY = fiscal year; NHOPI = Native Hawaiian or Other Pacific Islander; Pop = population; RCP = ReConnect Program.

Note: Eligibility was determined using Federal Communications Commission data for December 31, 2018. All racial categories refer to populations of any ethnicity (e.g., Hispanic as well as non-Hispanic). Hispanic and non-Hispanic ethnic categories refer to Hispanic populations of any race. These race and ethnic categories are classified by the U.S. Census Bureau based on standards set by the Office of Management and Budget (Marks & Rios-Vargas, 2021). The estimates of the “Pop in areas with RCP applications as a percent of pop in eligible areas in December 2018” do not assume that all areas proposed to be served by RCP applications were eligible for the program.

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service, Federal Communications Commission, and 2020 Population Census data.

Figure A.5

Population in areas with ReConnect applications and approved projects as a percent of 2018 eligible population, and population with approved projects as a percent of population with applications in FY 2019–20, by geographic type



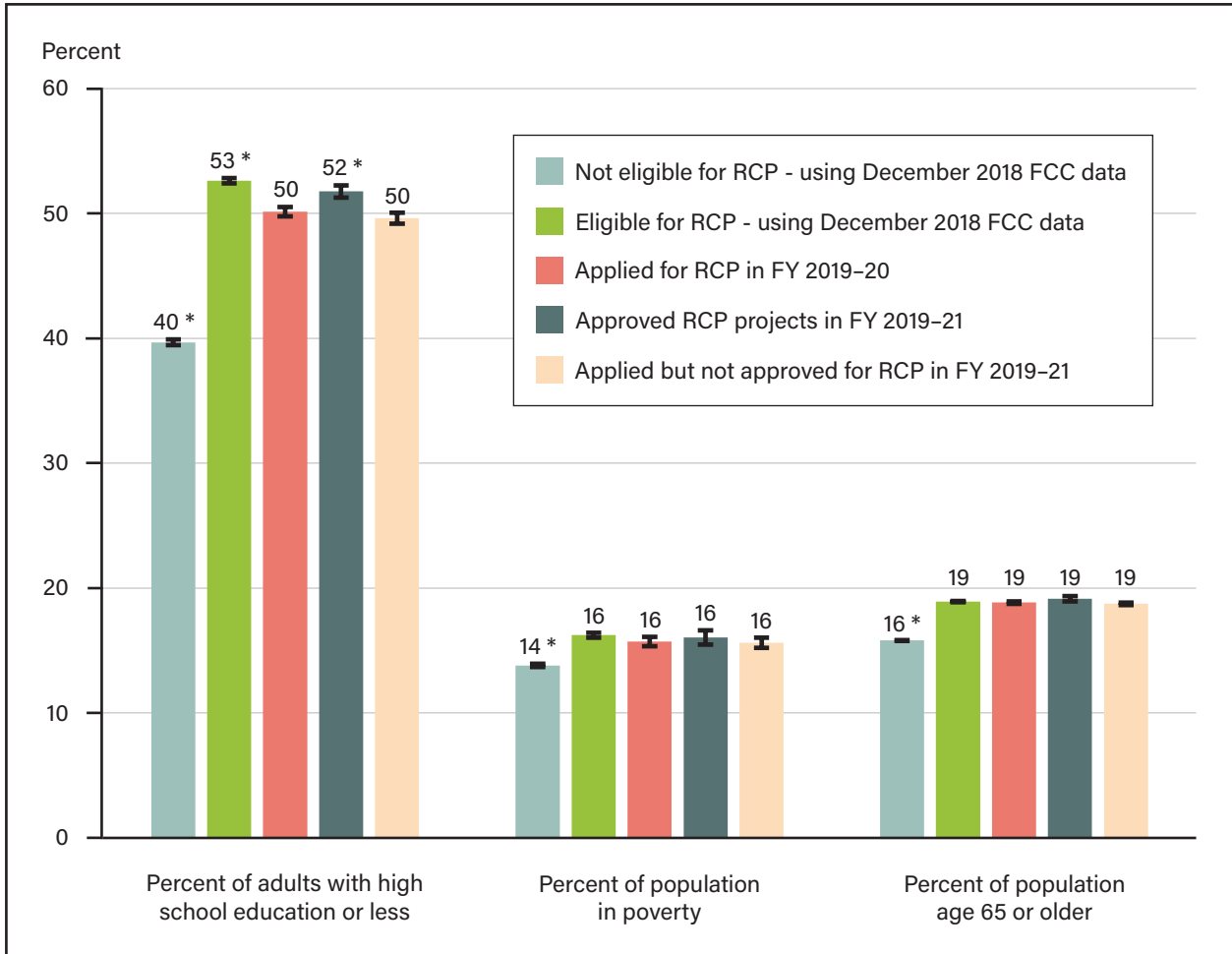
FY = fiscal year; Pop = population; RCP = ReConnect Program.

Note: Eligibility was determined using Federal Communications Commission data for December 31, 2018. Census tracts with Rural-Urban Commuting Area (RUCA) codes of 1, 2, or 3 are classified as metropolitan; tracts with RUCA codes of 4, 5, or 6 are classified as micropolitan; and tracts with RUCA codes of 7, 8, 9, or 10 are classified as small town/rural. Population shares were computed using 2010 Population Census data because RUCA codes based on 2020 Population Census data were unavailable. The estimates of the “Pop in areas with RCP applications as a percent of pop in eligible areas in December 2018” do not assume that all areas proposed to be served by RCP applications were eligible for the program.

Source: USDA, Economic Research Service (ERS) analysis of USDA, Rural Utilities Service, Federal Communications Commission, 2010 Population Census data, and USDA, ERS 2010 Rural-Urban Commuting Area codes.

Figure A.6

Population characteristics in 2015–19 of areas not eligible for ReConnect Program in 2018, eligible areas, areas with applications, and approved and unapproved projects



RCP = ReConnect Program; FCC = Federal Communications Commission; FY = fiscal year.

* = denotes which differences between subgroups are statistically significant ($p < 0.05$).

Note: Eligibility was determined using Federal Communications data for December 31, 2018. 95- percent confidence intervals are shown with horizontal lines connected by a vertical line (I). Differences in all statistics between ineligible areas and the other four categories are statistically significant. Other statistically significant differences include differences in the share of adults with a high school education or less between all categories except the difference between all areas with RCP applications and areas with RCP applications that weren't approved. Standard errors and confidence intervals were estimated using the American Community Survey Variance Replicate Estimate Tables for the 2015–2019 survey.

Source: USDA, Economic Research Service analysis of USDA, Rural Utilities Service, Federal Communications Commission, and 2015–2019 American Community Survey data.