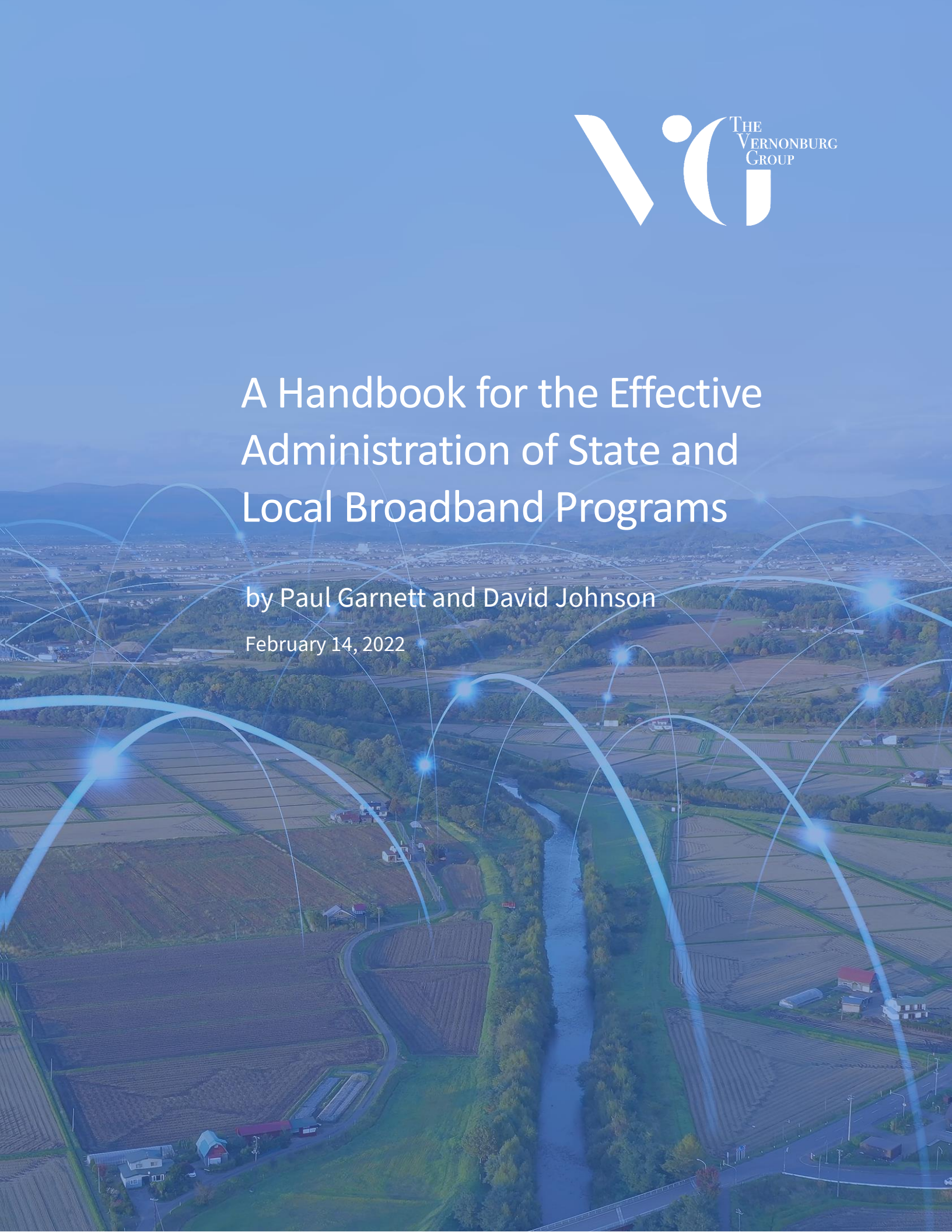

A Handbook for the Effective Administration of State and Local Broadband Programs

by Paul Garnett and David Johnson

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The Vernonburg Group

The Vernonburg Group is a full-service consulting firm helping corporate, non-profit, and government clients close the global broadband connectivity gap. The Vernonburg Group offers decades of practical experience in technology, media, and telecommunications (TMT) business model incubation, market assessment and entry, technical design and support, project financing, policy and regulation, and program development and management – in both developed and emerging markets.

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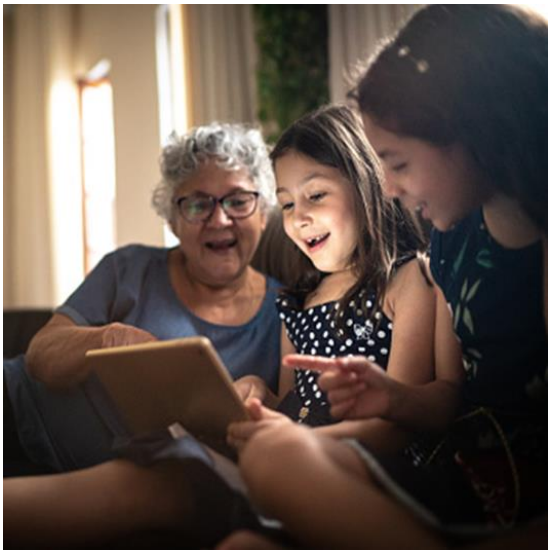
Executive Summary

How to Use this Handbook

This handbook is intended to help state, city, and local governments most effectively administer American Rescue Plan Act (ARPA),[i] Infrastructure Investment and Jobs Act (IIJA),[ii] and other funds for broadband availability and adoption programs. It recommends evidence-based best practices and focuses on models that have proven effective.

The COVID-19 pandemic has increased our collective focus on the centrality of broadband. As a result, policymakers and regulators are directing unprecedented funding toward broadband access and adoption programs. So much of our future depends on the success of this undertaking. This moment must not be wasted.



This handbook can guide governments at all levels in seizing this opportunity to develop comprehensive strategies to build high-speed broadband networks in areas where they do not yet exist; help more U.S. residents subscribe to broadband where networks do exist; and think holistically about how connectivity initiatives further other public policy priorities.

In order to get the job done properly and to maintain public confidence in the undertaking, officials must spend the funds wisely and optimally.

Evidence-Based Policy Making

When determining a broadband strategy, state, city, and local governments should look to high-quality data to get an accurate picture of fixed broadband availability, adoption, and usage. Importantly, decisions should be data-driven to ensure the best results.

Ubiquitous Connectivity is Within Reach for All Communities

Specific estimates of unserved households differ on the edges but are directionally consistent in showing that the federal government has allocated an appropriate level of resources to bring broadband to all areas where networks are not yet deployed, and to help reach Americans who are more hesitant to subscribe. The table below shows some of the largest federal funding sources for broadband availability and adoption programs (states have discretion on how much ARPA funds are allocated for broadband).

Table 1: Federal Broadband Funding Sources

Program	Funding Available
Broadband Equity, Access, and Deployment Program (NTIA)	$42.45 Billion
Affordable Connectivity Program (FCC)	$14.2 Billion
Digital Equity Grant Program (NTIA)	$2.75 Billion
ARPA Coronavirus Capital Projects Fund (Treasury)	$10 Billion
ARPA Coronavirus State and Local Fiscal Recovery Funds (Treasury)	$350 Billion
Emergency Connectivity Program (FCC)	$7.17 Billion

Cartesian, a consultancy, estimates that 19 million households lack access to at least 100/20 Mbps and the total subsidy cost to connect these locations would be $35 to $67 billion. It also estimates a subsidy cost of $5 to $20 billion per year to close the adoption gap in the next ten years.[iii] New Street Research estimates 14 million households lack access to 100/20 Mbps at a total subsidized cost of between $35 to $75 billion utilizing existing providers to close this gap.[iv] These estimates suggest that a goal of universal 100/20 Mbps connectivity available and affordable to all households is attainable with the current level of funding.

There are good reasons for optimism:

- The connectivity tool kit is growing.

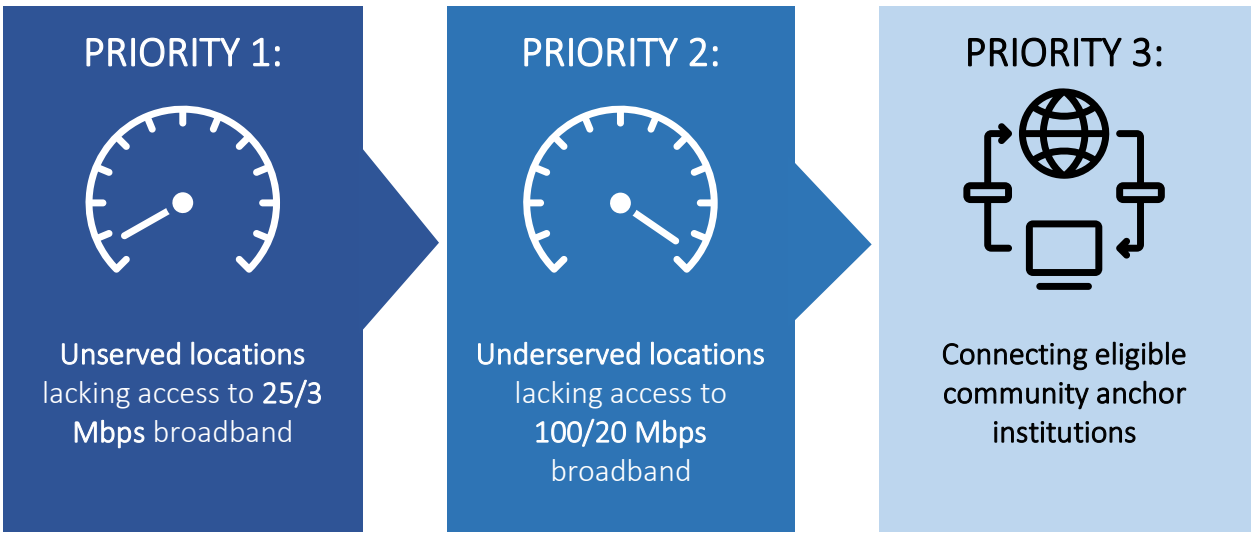
Network providers are deploying a range of next-generation technologies to make high-speed broadband available to more Americans. In 2022 and beyond, high-speed fixed networks will be deployed more deeply into rural areas with the help of government subsidies, the launch of 5G mobile and fixed wireless networks will accelerate, and Low Earth Orbit satellite providers will continue to deploy broadband services in the U.S. and globally. No one technology can cost-effectively bring fixed broadband services to all locations (in spite of what some marketing materials might claim). Fixed network providers will have more options than ever to utilize different technologies to reach customers located in a variety of settings.

- **Broadband networks are resilient.**
  The COVID-19 pandemic tested the resilience of Internet infrastructure as bandwidth demand skyrocketed to meet shifting patterns of usage for remote work and education. Network and infrastructure operators were able to meet the challenge by reacting quickly to increased demand with additional last-mile, interconnect, and server capacity. Broadband networks were well prepared, as the U.S. already had in place a well-diversified network of cable and power infrastructure, and a large number of Internet Exchange Points (IXPs).

Where is there a Need for Broadband?

While broadband definitions are largely a legal and regulatory construct, they are important for regulators and program administrators because they define areas lacking access to desired service levels, help prioritize policy interventions, and set baselines for broadband funding obligations.

First, program administrators should determine, consistent with the relevant statutes, where the need is greatest in their community. To that end, the IIJA defines as "unserved" those areas lacking access to 25/3 Mbps Internet connectivity and as "underserved" those areas lacking access to 100/20 Mbps Internet connectivity. The IIJA prioritizes funding for unserved areas and then for underserved areas (and for anchor institutions after that). Recipients of IIJA broadband deployment support must provide residential broadband services at speeds of at least 100/20 Mbps.

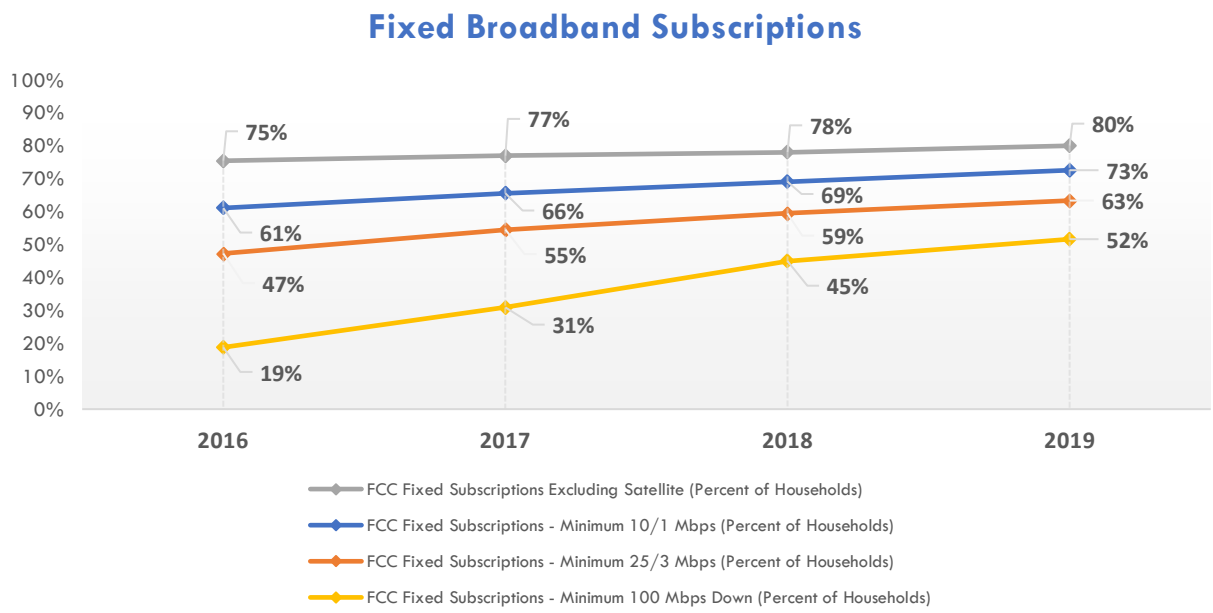


This framework makes sense and reflects evidence-based policymaking. The vast majority of U.S. residents have access to 25/3 Mbps and a significant majority have access to 100/20 Mbps. This reinforces the need to prioritize communities that lack such connectivity. The most recent estimates indicate that somewhere from 2% to 13% of the population lacks access to at least 25/3 Mbps, and from 11% to 22% lacks access to at least 100/20 Mbps.[v]

A common question related to broadband speeds is whether symmetry is a worthy policy goal. This would be a tremendous undertaking, as only about a third of U.S. residents currently have access to speeds of at least 100/100 Mbps. **There is no evidence that data consumption will become symmetrical any time in the foreseeable future**. Even after the shift to remote work and education during the COVID-19 pandemic, with large increases in the use of video conferencing, residential broadband customers still used 14 times more downstream versus upstream data; *i.e.*, the traffic flow was highly asymmetrical.[vi] There is also no evidence that data consumption patterns will change in any appreciable way or become symmetrical any time in the foreseeable future.

> A goal of making 100/20 Mbps connectivity available to every household, making it affordable for all consumers, and implementing comprehensive broadband adoption programs is achievable with existing federal, state, and local funding sources.

Furthermore, providing 100/100 Mbps access to every household in the U.S. would cost approximately three times that of a 100/20 Mbps buildout without any clear benefit backed up by data. The subsidization cost could be as high as $179 billion – far higher than available federal and state broadband infrastructure funding.[vii] This funding gap would force policymakers to make hard decisions about which areas get broadband and which do not – and, most critically, **network operators would be incented to deploy first in urban and suburban markets where per-user costs are lower and average revenues are higher – even though these areas generally already have access to high-speed Internet.** Broadband adoption gaps will remain unaddressed.

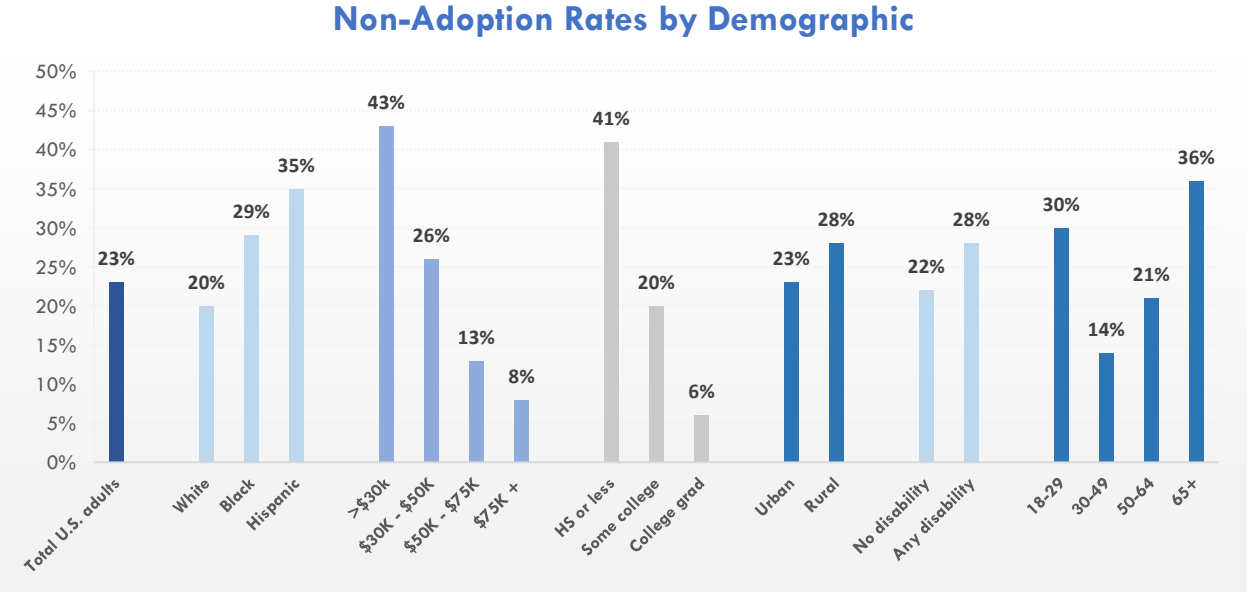


Source: FCC

Adoption is the Biggest Challenge

The broadband adoption gap is actually far greater than the broadband availability gap. And, while the availability gap is closing, the adoption gap persists.

Undoubtedly, we need even better data on broadband adoption, but available data shows that non-adoption appears strongly linked to certain demographic variables – income, age, disability, education level, literacy, rurality, and some ethnic distinctions.



Source: Pew Research Center

Closing the adoption gap will be harder than closing the broadband availability gap. Even if high-speed fixed and mobile broadband becomes universally available and service is made affordable for low-income users, a large percentage of the U.S. population will likely still remain offline.

A variety of factors account for the adoption gap – affordability of both services and devices, relevancy of content and degree of interest, safety and security of Internet use, digital skills attainment, literacy, and lack of trust in private and public low- and no-cost programs. We still have a lot to learn about the adoption gap – and the Affordable Connectivity Program (ACP) created by the IIJA (and managed by the Federal communications Commission) offers our best opportunity to better understand and address it. Broadband funding is finite – *even with massive injections of federal and state government stimulus funding*, the entire connectivity tool kit will be needed to close broadband availability and adoption gaps.

The IIJA Can Serve as a Template for Broadband Funding Programs

In contrast to earlier rounds of federal COVID-19 economic stimulus legislation, the IIJA provides extensive detail to state, city, and local governments looking to develop and implement broadband availability and adoption programs. The IIJA also gives state, city, and local governments flexibility to award broadband deployment subgrants for a wide range of activities, including: unserved and underserved service projects; data collection, broadband mapping and planning; installing Internet and Wi-Fi infrastructure or providing reduced-cost broadband within multi-family residential buildings; and broadband adoption programs, including programs to provide affordable Internet-capable devices. Largely aligned with the nine broadband funding principles outlined in the next section, the IIJA can serve as a template for all state, city, or local government broadband policy interventions.

The IIJA can serve as a template for all state, city, or local government broadband policy interventions.

Broadband Funding Principles for Program Administration

To allocate broadband funding as effectively as possible, state, city, and local governments should follow nine broadband funding principles.

Broadband Funding Principles		
Prudent administration and oversight	**Targeted**	**Technology neutral**
Broadband capable	**Secure and resilient**	**Best value**
Non-distortionary	**Deployed quickly**	**Equitable by design**

With careful planning, coordination, and assessments, officials can use targeted, data-driven interventions to increase both availability of broadband and demand for broadband and digital services.

Step 1: Set Up a Broadband Office to Enable Prudent Administration and Oversight

Accountability and administration should be vested in a single entity to ensure consistent decision-making and transparency. The entity should have:

(1) clear authority to implement the administration of the program;
(2) knowledge of state and federal rules and all broadband funding programs; and
(3) sufficient funding to ensure achievement of the multi-year goals.

Step 2: Prepare for Federal Funding Allocations

States should identify those areas that lack 25/3 Mbps and 100/20 Mbps to:

(1) begin planning on how they can get to 100% availability in areas deemed unserved (setting the stage to unlock funding for underserved areas); and

(2) be positioned to challenge the Federal Communications Commission's (FCC's) Digital Opportunity Data Collection (DODC) map (the basis for allocating IIJA funding among the states) if there are material discrepancies.

Step 3: Develop a Five-Year Broadband Action Plan

Consistent with IIJA requirements, state, city, and local governments should develop a five-year broadband action plan with clear, ambitious, and achievable policy-related commitments. The plan should include quantifiable supply-side (availability), demand-side (adoption), and network resilience targets to assess progress toward its goals.

Collaboration and coordination between federal, state, and local governments will be key to successful development and implementation of fixed broadband availability and adoption programs. Officials should also establish open and transparent decision-making, accounting for the widest array of perspectives from non-profits, community-based organizations, the private sector, and individuals. This will help build public trust and the feedback loops needed to ensure funds are being spent wisely.

Key broadband funding principles should guide development of the five-year broadband action plan:

- Prudent administration and oversight means striking the right balance between avoiding unduly burdensome processes, and imposing requirements necessary to ensure program integrity and establish measures to protect public funds, minimize waste, and protect taxpayers and consumers.

- The action plan should be targeted to address known market failures. Broadband availability funds focus on communities that are unserved first (and underserved second) consistent with the bipartisan framework in the IIJA. State, city, and local broadband funding programs should complement and not crowd out private sector investments and initiatives.

- Broadband funding should be made available on a technology neutral basis and should recognize that different technologies can be relied upon to build an effective broadband program. A technology neutral requirement acknowledges that providers offer a range of broadband services that allow a user to do everything they need or want to do online, and there is no one technology that is a panacea for all areas. Funding programs should not be limited to fiber-to-the-premises (FTTP)-based network deployments, as technological favoritism would reduce competition for subsidies and increase program costs. A 100/100 Mbps symmetrical speed requirement would also not be technologically neutral as it would significantly reduce the scope of technologies and providers eligible for funding, while increasing program costs.

- Administrators should avoid standards that would divert funds from unserved areas to those that already have broadband networks. Deployment programs should only fund broadband capable network build-out. Programs should require fund recipients to deploy networks capable of providing households with at least 100/20 Mbps broadband speeds, consistent with the goals of new broadband funding programs (*e.g.*, IIJA BEAD

program) and meeting the high-capacity needs of a typical household (*e.g.,* HD video streaming, video conferencing, and online gaming).

- Broadband fund recipients should be required to ensure that their networks are **secure and resilient** by optimizing their critical infrastructure and network resilience and implementing best-in-class cybersecurity measures.

- To ensure that the funding program creates the **best value** for community members, broadband funding mechanisms should require a competitive bidding process, and other measures such as a transparent scoring system that balances project costs and other factors. This will help protect taxpayers, encourage fair outcomes, and lead to the best results. To ensure that program dollars are spent wisely, IIJA imposes a 25% matching requirement for eligible entities and subgrantees when deploying broadband in non-high-cost areas, which NTIA may waive or reduce.

- The program should be **non-distortionary** or do no harm in a broadband marketplace that is working to deliver reliable, high-speed options, by focusing funding on areas that truly lack access to broadband and avoiding the construction of duplicative networks.

- Preference should be given to broadband projects that can be **deployed quickly**, with broadband providers committing to rapid deployment of broadband networks and services.

- The action plan should be **equitable by design** and should seek to address underlying social and economic inequalities and focus, as appropriate, on: low-income groups; rural areas; communities with low rates of literacy and digital skills; older cohorts; persons with disabilities; and minority groups with low adoption rates. States, cities, and local governments should consider supplementing the ACP using federal funding to provide additional support to targeted communities.

Step 4: Set Clear, Data Driven Goals

Set clear, multi-year broadband availability and adoption goals that are aggressive and achievable. Publicly stated goals will create the right incentives and benchmarks to hold stakeholders accountable to get the job done.

Suggested targets to measure effective broadband accessibility and adoption include:

By December 31, 2025	*By December 31, 2028*
• 100/20 Mbps broadband availability in 50% of unserved locations lacking access to 25/3 Mbps. • 80% of households subscribing to broadband. • 80% of households owning a laptop, tablet, or personal computer. • 60% of population acquiring essential digital skills.	• 100/20 Mbps broadband availability in 100% of unserved locations lacking access to 25/3 Mbps. • 100/20 Mbps broadband availability in 100% of underserved locations lacking access to 100/20 Mbps broadband. • 90% of households subscribing to broadband. • 85% of households owning a laptop, tablet, or personal computer. • 80% of the population acquiring essential digital skills.

These targets should be developed through a transparent process that incorporates input from impacted stakeholders.

Step 5: Establish a Monitoring and Evaluation Program for IIJA and Other Reporting Requirements

The IIJA requires states to track progress towards their five-year action plans by collecting broadband data from network operators every six months.

- The **first report** is due to NTIA **within 90 days of receiving grant funds** covering planned use of funds, subgrant procedures, and subgrantee compliance.
- Thereafter, eligible entities must submit **semiannual reports** (every six months) not later than one year after receiving grant funds and until all funds are expended.

- A final report must be submitted by the eligible entity within one year after all funds are expended.
- Likewise, subgrantees must submit to the state semiannual reports with details on unserved, underserved, and anchor locations covered and served, advertised and actual speeds, pricing, and mapping.

To make monitoring and evaluation programs more meaningful and effective, broadband availability and adoption programs should be performance based.

Step 6: Establish Robust Accountability Measures

To inform their decision making, state, city, and local governments should conduct regular assessments of broadband availability, adoption, and usage combining data from network operators, household surveys, and third-party data so that they can best identify priority needs.

Officials should adopt best practices to ensure real-time transparency of funding awards, performance issues (*e.g.*, cost overruns), and individual projects' progress to help guard against waste. These protections should be made available for public comment before being finalized.

- States should regularly collect granular data on broadband availability, adoption, and performance.
- Under the IIJA, states are required to collect a range of broadband data from subgrantees once every six months, but more frequent or more detailed data collection might be needed to track specific investments and to better target future interventions.
- This data should be regularly shared with the public to establish a baseline and help facilitate clear goal setting.
- Hold an open, transparent, and unbiased assessment and review of progress at least annually.
- Be prepared to course-correct and update the action plan in response to changed conditions.

Step 7: Implement Measures in your Community to Increase the Availability of Broadband

- Governments should use best practices to optimize network deployments. Officials should utilize, as appropriate, policies that reduce barriers and promote efficiencies, such as flexible "dig-once" policies, removing red tape and streamlining permitting, and encouraging public-private partnerships.

- When other efforts fail to incentivize network operators to extend broadband services to unserved and underserved households, limited federal and other funds should then be allocated to build networks to reach unserved and underserved households. IIJA BEAD subgrantees must meet the following requirements, and these could be the basis for other broadband availability programs:

    - Deploy broadband networks to any customer requesting service in the project area at speeds of at least 100/20 Mbps that can support latency sensitive applications with at least 99.45% uptime.

    - Offer at least one low-cost broadband option, as defined by the state, to eligible subscribers.

    - Deploy the network and begin providing service within four years of receiving the grant, in most cases.

    - Conduct public awareness campaigns in communities where infrastructure has been deployed to promote adoption.

    - Provide wholesale access if the entity can no longer provide services to locations covered by the grant.

    - Adhere to other quality of service and best practice network administration requirements.

- Create a fair, balanced, and reasonable challenge process to ensure that limited government funding is being spent consistent with the law and is not being used, for example, to overbuild broadband networks in ways that the IIJA and other programs forbid.

- Federal, state, and local coordination will be critically important to ensure that various federal, state, and local broadband programs complement – and do not conflict – with one another (*e.g.*, mistakenly funding the same broadband network deployment more than once or funding multiple network deployments to the same locations).

Step 8: Implement Measures to Increase Demand for Broadband and Online Applications

Policy makers should give equal weight to programs focused on adoption of broadband and online applications as to programs focused on promoting broadband availability. Officials should encourage private sector-led broadband adoption initiatives and public-private partnerships. Many internet service providers (ISPs) already have highly successful broadband adoption

programs in place to utilize the ACP and these can be further supported by state, city, and local government programs.

- Consistent with the IIJA, each local authority should produce five-year action plans for the deployment of **"affordable" broadband services** within their borders. The plans should address the various barriers to broadband adoption, including cost, digital literacy and skill levels, perceived lack of relevance, safety and security concerns, and lack of trust in private and public digital inclusion programs.
- Develop plans to competitively award subgrants for broadband adoption, including programs to provide **discounted services and Internet-capable devices** for vulnerable or marginalized groups such as low-income households, persons with disabilities, older persons, and minority populations.
    - Consider "topping up" the FCC's ACP to increase monthly service subsidies from $30 to $50 per month for eligible low-income households.
    - Help low-income households obtain device discounts above those provided for under the ACP.
- **Establish a digital skilling program** that promotes the five Essential Digital Skills of problem-solving, communicating, transacting, handling information and content, and being safe, legal, and confident online – with a focus on training and upskilling workers.
- **Develop an outreach plan** that focuses on populations that have not adopted broadband due to language barriers, misunderstanding of available programs, and online security and privacy concerns.
- **Establish streamlined programs** with simple application requirements and eligibility criteria.

Step 9: Leverage Community-Led Initiatives and Public-Private Partnerships

States, cities, and local governments should leverage community-based organizations and public-private partnerships to successfully increase availability and adoption of broadband and online services. Public-private partnerships between state and local governments and ISPs can further accelerate broadband availability and adoption programs and serve as a model for others. Because the causes of the adoption gap are so varied, policymakers may need to localize broadband adoption interventions and fully utilize community-based organizations and leaders who best know the local community challenges.

States may implement one or more of the following:

- **Require cooperation between a public and private entity** to qualify for funding.

- Apportion duties with private partners, taking on tasks such as coordination with local entities and outreach, while private partners focus on network deployment and administration.

- Encourage public support for non-governmental digital equity programs.

Useful Definitions

Adoption (Subscription): Broadband is considered adopted when a consumer to whom broadband is available actually subscribes to or purchases broadband service. Consumers will subscribe to or purchase service at a specific speed tier available to them. When describing broadband statistics, the terms "broadband adoption rates" and "broadband subscription rates" are often used interchangeably.

Availability (Access, Deployment): Broadband is considered available if an ISP can provide a location with a broadband connection without an extraordinary commitment of resources. This may be as simple as installing a modem in a residence that connects to a copper, fiber, or coaxial cable, or may require adding a short section of cable or a fixed wireless link to a premises. The terms broadband availability, access to broadband, and broadband deployments are often used interchangeably. An operator's broadband availability rate can be reported at different levels of geography, such as a census block or at an individual location. Speed tiers that are available in a geographic location such as census blocks or to a premises are also often reported. Speed tiers are characterized using a combination of download and upload speeds such as 25/3 Mbps, 100/20 Mbps, or 100/100 Mbps.

Broadband: The FCC defines Internet speeds that are at least 25 Mbps down and 3 Mbps up (25/3 Mbps) as broadband. In 2015, the FCC concluded that the 25/3 Mbps broadband definition was justified considering advances in technology, market offerings by broadband providers, and consumer demand. At that time, the FCC reported that, as of 2013, approximately 83% of the U.S. population had access to 25/3 Mbps broadband, but that less than half of the rural U.S. population had such access. While standard broadband definitions are largely a legal and regulatory construct, they are important for regulators and program administrators because they 1) define areas lacking access to desired service levels, 2) help prioritize policy interventions, and 3) set baselines for broadband funding obligations.

Fixed Broadband Connections: These are fixed data transmission lines used to connect homes and businesses and use technologies such as Digital Subscriber Lines (over copper lines), Cable (over coaxial lines), Fiber, and Fixed Wireless Access. Technologies can also be combined such as Hybrid Fiber-Coaxial (HFC) that combines fiber to a headend and cable to subscriber premises.

- Digital Subscriber Line (DSL): A family of technologies that are used to transmit digital data over copper telephone lines. DSL services can be delivered simultaneously with wired telephone service on the same telephone line. The current typical speeds available are 8 Mbps to 24 Mbps downstream; 1 Mbps to 3.3 Mbps upstream.

- Fiber: Fiber to the home or premises is a type of high-speed broadband technology that uses fiber optic cables to transmit data to a network interface on the exterior of the customer premises. When fiber is delivered to a premises, it is called Fiber-to-the-Premises (FTTP). FTTP is also sometimes called FTTH (Fiber-to-the-Home). The current typical speeds are 50 Mbps to 1 Gbps downstream and upstream.

- Hybrid Fiber-Coaxial (HFC): A network technology that combines optical fiber and coaxial cable to deliver broadband services. The fiber optic network extends from the cable operators' master headend, sometimes to a regional headend, and out to a neighborhood hub site, and finally to an

optical node which typically serves from 100 to 450 homes. In the optical node, the broadband signal is transformed from an optical signal to a radio frequency (RF) signal for transmission over the coaxial network to subscriber homes. HFC networks provide bi-directional high-speed data service that can simultaneously deliver cable television and broadband service; this is the typical network architecture for most modern cable ISPs. At the time of publication, the current typical speeds available are 50 Mbps to 1.2 Gbps downstream; 5 Mbps to 200 Mbps upstream. Next generation HFC technology being rolled out in the near term is scalable to deliver download speeds up to 10 Gbps, and multi-gigabit upload speeds.

- Fixed Wireless Access (FWA): This is a way of providing wireless connectivity through radio links between two fixed points and can provide wireless Internet access to homes or businesses without laying fiber and cables to provide last mile connectivity. To deliver service, the ISP will install a wireless device at the customer's premises, which will be wirelessly connected to another wireless device at a tower or another high site location. A variety of fixed wireless technologies have been used such as LTE, Wi-Fi and Wi-Max, and most recently 5G. The current typical speeds available for FWA are up to 500 Mbps downstream and up to 500 Mbps upstream.

Internet Performance: The experience that a user has when connected to the Internet can be measured quantitatively or qualitatively. Quantitative measurements are carried out by users themselves when doing speed tests from their phones or web browsers, or by operators using equipment in their networks. These tests usually measure the downlink performance (speed from an Internet service to the user's device) in Mbps, uplink performance (speed from a user to an Internet service) in Mbps, and the round-trip delay measured in milliseconds between a user's computer and an Internet service (latency). Qualitative measurements are usually done by asking a user to offer a personal rating (*e.g.*, one to five stars) of the quality of an Internet service. This is often presented to a user after using a service like Zoom or Skype.

Internet Speeds: This captures the amount of digital information that can move through an Internet link in one second. Speeds are provided for the downlink (the link between an Internet service and a user's device) and the uplink (the link between a user's device and an Internet service). Today, speeds are usually specified in Megabits per seconds (Mbps); however, the speed of Internet connections is increasing with each new generation of technology introduced into the market.

Satellite Broadband Connection: Provides broadband access through communication satellites. Communication satellites can be Geostationary Earth Orbit (GEO) satellites or more recent Low Earth Orbit (LEO) satellites. LEO satellites such as the newly launched Starlink and OneWeb satellites provide much higher speed and lower latency links than GEO satellites. Users install a satellite dish at their premises to receive a broadband service from a satellite broadband service provider. The current typical speeds available for LEO satellites are 5 Mbps to 100 Mbps downstream; 1 Mbps to 20 Mbps upstream. The current typical speeds available for GEO satellites are 2 Mbps to 50 Mbps downstream; 0.2 Mbps to 5 Mbps upstream.

American Rescue Plan Act

The American Rescue Plan Act (ARP or ARPA) includes nine provisions that provide about $388.1 billion in flexible funding for a variety of digital equity activities.[viii] Table 3 below shows the breakdown of the nine provisions.

Table 2. ARPA Funding to Address the Digital Divide

ARPA provision	Funding and Expiration	Primary Recipients	Physical Network Build-Out	Device Support	Broadband Connectivity Subscription Support	Digital Literacy Trainings
Elementary and Secondary School Emergency Relief Fund	$122.775 billion through Sept 30, 2023	Local educational agencies		X	X	
Institute of Museum and Library Services	$200 million until expended	State library administrative agencies	X	X	X	X
Economic Adjustment Assistance	$3 billion through Sept 30, 2022	Department of Commerce, states, and communities	X			
Homeowner Assistance Fund	$9.961 billion through Sept 30, 2025	States, territories, and Tribal governments			X	
Emergency Connectivity Fund	$7.171 billion through Sept 30, 2030	Schools and libraries	X	X	X	
Coronavirus State Fiscal Recovery Fund	$219.8 billion through 2024	States, territories, and Tribal governments	X	X	X	X
Coronavirus Local Fiscal Recovery Fund	$130.2 billion through 2024	Metropolitan cities, non-entitlement units of local government, and counties	X	X	X	X
Coronavirus Capital Projects Fund	$10 billion until expended	States, territories, and Tribal governments	X	X		
Local Assistance and Tribal Consistency Fund	$2 billion through Sept 30, 2023	Revenue sharing counties and Tribal governments	X	X	X	X

Source: Brookings Analysis of ARPA[ix]

Infrastructure Investment and Jobs Act

On November 15th, 2021, President Biden signed into law the Infrastructure Investment and Jobs Acts (IIJA) that includes $65 billion to improve high-speed Internet access and affordability.[x] The broadband funding in the bill is aimed at building high-speed Internet networks, helping low-income families pay for service, and a digital equity program. IIJA will provide further funding to three current broadband programs, the EBB program (now called the Affordable Connectivity Program or ACP), ReConnect, and the Tribal Broadband Connectivity Grant Program, as well as fund entirely new broadband programs. Broadband funding from IIJA follows new broadband guidelines that discourage overbuilds while prioritizing unserved and underserved areas with deployed speeds of at least 100/20 Mbps.

Table 3. IIJA Funding to Address the Digital Divide

IIJA provision	Funding and Expiration	Primary Recipients	Physical Network Build-Out	Device Support	Broadband Connectivity Subscription Support	Digital Literacy Trainings	Other
Broadband Equity, Access and Deployment (BEAD) Program	$42.45 billion, until expended	States; Subgrants to cooperatives, non-profits, PPPs, private company, public or private utilities. Local gov'ts	X	X	X	X	X
Affordable Connectivity Program	$14.2 billion, until expended	Consumers - Households, Tribal households		X	X		
State Digital Equity Planning Grant Program	$60 million	States					X
State Digital Equity Capacity Grant Program	$1.44 billion, $240 million for 2022 and $300 million each year 2023-2026	States	X	X	X	X	X

IIJA provision	Funding and Expiration	Primary Recipients	Physical Network Build-Out	Device Support	Broadband Connectivity Subscription Support	Digital Literacy Trainings	Other
Digital Equity Competitive Grant Program	$1.25 billion, distributed over 5 years	Political subdivisions; agencies responsible for adult education, literacy, workforce development; native American tribes; non-profits; community anchor organizations		X	X	X	X
ReConnect	$2 billion	States, territories, and Tribal governments, corporations, LLCs/LLPs, cooperatives	X				
Tribal Broadband Connectivity Program	$2 billion	Tribal governments, organizations, colleges, or universities; Dept of Hawaiian Homelands; Native corporations	X	X	X	X	X

IIJA provision	Funding and Expiration	Primary Recipients	Physical Network Build-Out	Device Support	Broadband Connectivity Subscription Support	Digital Literacy Trainings	Other
Enabling Middle Mile Broadband Infrastructure Program	$1 billion, through Sept 30, 2026	States; Tribal governments; tech companies; public, private, and cooperative utilities; private companies; nonprofits; regional planning counsels; Native entities; economic development authorities	X				
Private Activity Bonds	$600 million	State and local government projects	X				

Author Bios

Paul Garnett is Founder and CEO of the Vernonburg Group where he leverages extensive experience in domestic and international telecommunications and technology law and policy, market and business development, strategic alliances, and technology and business model incubation. Prior to starting the Vernonburg Group, Paul spent 12 years at Microsoft where he created and led the Airband Initiative, leveraging a partner-driven approach to extend broadband access to unserved communities in the U.S. and in over 20 emerging markets. This included investing in 25 Internet service providers and connectivity hardware and solution providers and running a grant fund focused on early-stage companies. Prior to launching the Airband Initiative, Paul led Microsoft's global spectrum policy work and started the Dynamic Spectrum Alliance. Prior to Microsoft, Paul worked for CTIA-The Wireless Association, the United States Federal Communications Commission, the law firm Swidler Berlin (now Morgan Lewis), and the management consulting firm Price Waterhouse. Paul has a Juris Doctor Cum Laude from the Catholic University of America Columbus School of Law and a Bachelor of Arts in Political Science from Union College. Paul is a member of the Bar of the U.S. District of Columbia.

David Johnson leads the Vernonburg Group's work on broadband data, mapping, and network engineering. David carries out research and deployment on technologies that have the potential to provide access to poorly connected regions or areas which lack affordable Internet access. His work focuses on wireless connectivity, Internet access architectures, and novel spectrum access techniques. David also serves as an adjunct senior lecturer in the Computer Science Department at University of Cape Town, South Africa in the ICT4D lab and a senior research associate at Research ICT Africa. He was previously a principal researcher in the Networks and Media group of the CSIR Meraka Institute in South Africa and an IT Policy fellow at the Centre for Information and Technology at Princeton University. He has published 70 articles in the general area of wireless connectivity and ICT for development and a book on TV white space technology. David earned a B.Eng in Electronic Engineering from University of Cape Town. He completed his M.Eng in Computer Engineering at University of Pretoria and a M.Sc. and Ph.D. in Computer Science from University of California, Santa Barbara on Internet architectures for rural developing regions.

Endnotes

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