



CONNECTED

A PEOPLE-CENTERED APPROACH TO DIGITAL INFRASTRUCTURE

BY ANDREW KELLER





Introduction

The internet is perhaps the only common utility for which widespread outages are unlikely to trigger calls for a state of emergency. Or where a lack of access by large swaths of the country is a “policy issue” instead of a full-blown crisis. And on the surface, this makes sense; humans cannot live without water, without heat or food or shelter, all of which are compromised when power or water service fails. But as larger pieces of society come to rely on digital infrastructure, the statement “humans can live without the internet” is, increasingly, inaccurate. Especially in the age of COVID.

Numerous studies have established broadband internet access as a social determinant of health, and internet access during the early stages of the COVID-19 pandemic dramatically altered health outcomes; in [one such study](#), a 1% increase in broadband access for metropolitan countries reduced Covid mortality by as many as 36 deaths per 100,000. Similar evidence is accumulating for everything from education to socioeconomic outcomes. Why, then, do we accept shortfalls in our digital infrastructure that we would never accept for any other utility?

While the move to “remote-everything” protected some from the health risk of in-person interactions, it also revealed the breadth and depth of America’s digital divide. [Nearly 162 million Americans](#), or roughly half of the country’s population, did not have access to high-speed internet at home at the end of 2020, leaving them without the means of navigating work and school amidst a public health crisis. And even those with quality broadband faced a slew of new, digital challenges, ranging from a deluge of health mis- and disinformation, to ineffective or faulty online public services, to the unfamiliar terrain of telehealth and telework.

It is in this context that we consider the Biden administration’s infrastructure agenda. If we are to truly “build back better,” we need a thorough postmortem on the state of our digital infrastructure that led us to where we are today, which this report aims to deliver.

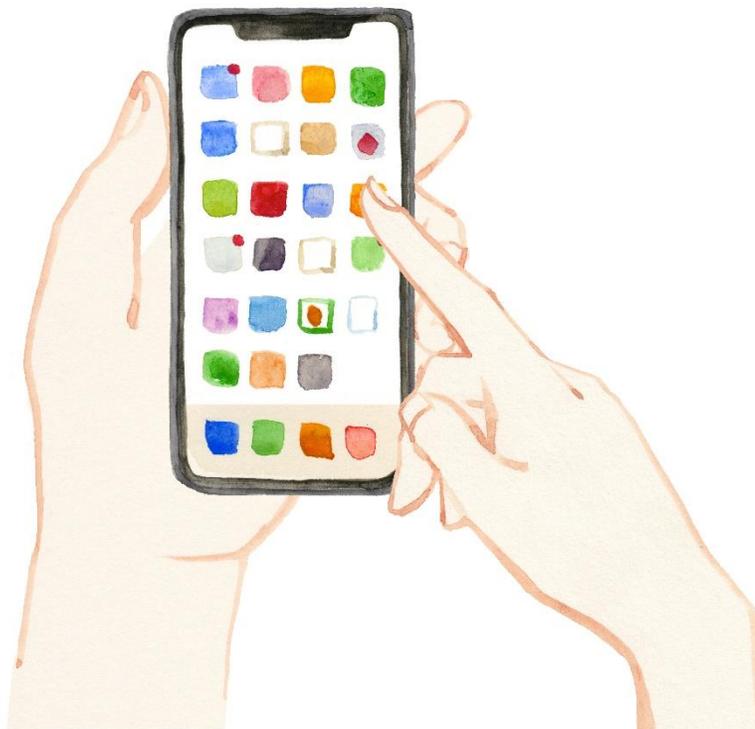
In the fall of 2021, we conducted individual interviews and convened three roundtables comprised of more than 70 experts from government, civil society, academia, and industry to delve into these matters. We centered these discussions around Siegel Family Endowment’s concept of

“[multidimensional infrastructure](#),” a framework which recognizes that infrastructure—or the material basis for the social and economic activity that comprises society—consists of more than just roads or bridges. Rather, the social and digital dimensions, without which many of our core services would cease to function, make up equal parts of an interconnected, multidimensional system. Looking through this lens, we can better identify the flaws that led to the inequities we are experiencing today.

What we found is that, when it comes to digital infrastructure, communities lack more than just broadband access. Rather, the delivery of effective digital services at the local level has been hamstrung by three primary obstacles: poor community-government relationships, an absence of data, and insufficient digital literacy

among key populations. These three “inputs” of digital infrastructure are often neglected, leading to lower-quality digital services. Even if local jurisdictions managed to digitize services during the pandemic, they may not have had the requisite data to understand where those services were most needed, the connections necessary to promote an effective service rollout, or a population with the literacy needed to effectively navigate such services.

The report below details the importance of each of these three barriers and suggests actions to address the resulting inequities moving forward. By reviewing pandemic successes and shortcomings through this lens of multidimensional infrastructure, we hope to chart a course for a more equitable recovery, and in doing so, truly build back better.



Defining Digital Infrastructure

There are many ways of interpreting digital infrastructure. To borrow from Siegel's whitepaper, it's the data, hardware and software, coding, and operating systems that make up the digital world, as well as the assets through which that world is transmitted: cell towers, broadband cables, computer networks, and satellites. Siegel further breaks down the definition into three parts:



Built environment of digital infrastructure. At its root, digital infrastructure is a physical system of broadband cables, fiber, satellites, cell towers, data servers, modems, and routers, along with the devices, such as smartphones, tablets, laptops, or desk computers, that connect to them.



Data and data infrastructure. Data refers to the digital representation of other things, including other data. Data infrastructure refers to the structured linkages between datasets, as well as the dependencies built on top of them.



Digital platforms. The term "digital platforms" describes the software, code, and cyber architecture that underpins how we interact with the digital world. These include things like websites, apps, and social media platforms. Increasingly, the definition is evolving to include critical digital utilities, such as search engine capabilities and social media platforms.

A Note on Broadband

This report reflects our institution's conviction that digital infrastructure encompasses more than just broadband connectivity. Indeed, by limiting ourselves to the physical hardware that undergirds our growing digital environment, we would overlook the critical social, informational, and organizational components that are essential for participation as full digital citizens in the modern age.

However, it must be noted that it was the strong feeling of many of our participants that the conversation on broadband as digital infrastructure is so foundational that we would be remiss not to identify it as such. Some went so far as to express that talking about digital inclusivity without centering broadband was equivalent to addressing symptoms of a disease without addressing its cause. While we maintain that the multidimensional nature of infrastructure requires us to climb multiple branches of the tree at the same time, it is worth restating the importance of quality, affordable broadband access for all.

Notably, with the passage of the Infrastructure Investment and Jobs Act, the disbursement of a major broadband investment nationwide is now more likely than ever. And yet, it is far from a foregone conclusion that these funds will be distributed equitably.

Historic definitions of unserved populations have tended to skew disbursement towards white, rural communities, which, while they are certainly in need of broadband investment, make up only 4.6 million households, compared to the nearly 13.6 million urban households that are unconnected. A focus on access rather than affordability, the latter of which constitutes a much greater barrier in many urban areas, further skews disbursement efforts away from communities of color, since many live in communities where providers technically provide nominal, if out-of-reach, services. Thus, if we remain quiet on this part of the conversation, we risk reproducing a racialized digital divide, even once the dust has settled from our new investment in infrastructure.

We therefore reaffirm that digital infrastructure efforts must necessarily include efforts to expand affordable, accessible broadband to all, and that only then will we manage to close the digital divide and achieve true digital equity.

Community Relationships as Infrastructure

Demand for “smart city” technologies (a phrase so conveniently ambiguous that its meaning is hard to pin down) has exploded in recent years, with related global revenue expected to [hit \\$189 billion in 2023](#), doubling its size from just five years earlier in 2018. In this environment, it may seem that there is a technical solution for any problem a city or a community might face. But this assumption overlooks a deceptively simple, but nonetheless important, question: does the technology we are building *actually* deliver what the community needs?

Such programs can be rife with high-tech solutions that go unused or that fail to meet their goals. Even some formerly popular initiatives, such as open data portals, have come under fire recently for sitting dormant, failing to drive uptake in the community at large. One roundtable participant even referred to

“At their core, these failures all have one thing in common: they designed *for* the community but not *with* the community.”

their city’s open data effort as “a graveyard of failed data projects.” At their core, these failures all have one thing in common: they designed *for* the community but not *with* the community. This often means that the designers did not have a full picture of the barriers and needs of a community, or the applicability of a particular solution. This resulted in the deployment of a solution that did not meet a community’s true needs.



History shows that technological uptake occurs when citizens are stakeholders in the process - when they understand and are consulted on new technologies deployed in their communities, and when those deploying technology make the effort to meet citizens where they are. When Kansas City rolled out the first installation of Google Fiber in 2011, its initial neighborhood selection process excluded most of the low-income, historically Black

communities east of Troost Avenue, a major thoroughfare that has acted historically as a line of *de jure*, and later *de facto*, segregation. This was largely because the selection process was [based on online pre-registration for Google Fiber](#), and therefore excluded communities on the losing side of the digital divide. Previous outreach had also neglected to convey the specific value of fiber to these communities, leading to less interest in the product.

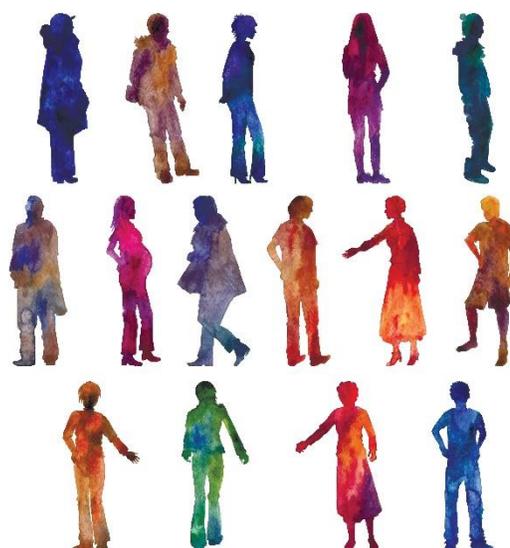
When Google dispatched employees to conduct a traditional, ground marketing campaign in predominantly Black neighborhoods, uptake increased dramatically across all neighborhoods, with a

substantial portion of new sign ups in poorer “fiberhoods” consisting of people who had never had an internet connection before. Engaging these communities directly, rather than assuming that their needs and circumstances were served by the online enrollment process, proved to be the deciding factor in the success of the project.

Given the biases that permeate the modern tech industry, it is therefore crucial that technical solutions are designed *with*, not merely *for*, the communities they target. Strong community relationships may reveal previously unidentified needs, opportunities for partnerships, and perhaps even analog solutions that may fit a community’s needs better than their technical counterparts. As participant Emily Tavoulareas, Managing Chair of the Tech & Society Initiative at Georgetown, put it, “Tech is not the goal—what it enables is the goal.”

Action Item 1: Structure Project Funding and Implementation Around ‘Human-Centered Design’ Principles

Human-centered design, a subset of ‘design thinking’, is a common and lauded method of problem solving in tech spaces. It can also play a powerful role in policy, especially in the rollout of tech-enabled solutions. At its core, it is simply an iterative method involving users in the design process and weeding out and challenging incorrect assumptions that the designer may have had going into the project. Harvard Business School [defines](#) Human Centered Design as “a problem-solving technique that puts real people at the center of the development process, enabling [organizations] to create products and services that resonate and are tailored to [their]



audience’s needs.” With its focus on user needs, beliefs, and behavior, human-centered design tends to be more inclusive and process-oriented and integrates implementation considerations into the design process to evade delivery problems that have plagued otherwise good solutions.

“There are a lot of principles of human-centered design that you can really abstract out to the policy level,” noted Tavoulareas. “You have an idea, great! Can you get it into the hands of people who are going to use it?”

The process works by bringing relevant users, including those users who may offer additional perspectives on accessibility, or on the needs of marginalized communities, into the process from the beginning and creating user profiles to understand their needs. These profiles outline their challenges

and needs, as well as potential solutions that might plug into their lives. This addresses from the outset the issue of a solution's relevance to the lives of citizens and avoids scenarios, such as the aforementioned racial enrollment gap for Google Fiber, by producing something that communities, which participate in a solution's design, can immediately find valuable. It also gives policymakers a chance to demonstrate the tech's value to the community and gain buy-in.

"It's the lack of focus on meaningful use cases," stated Tom Esselman, Executive Director of PCs for People, that prevents tech uptake. For example, instead of talking about abstract goals and possibilities of a technology, "Let us show you how it can help you make an appointment with your doctor."

Case Study: Louisville Digital Inclusion Design Jam

To apply design thinking to the digital divide, the city of Louisville tapped the local branch of the Interaction Design Association (IxDA) to host their first ever Digital Inclusion Design Jam in 2019. Structurally, this event resembled the hackathons that many cities have hosted to overcome local governance problems. The premise is to gather young industry experts and practitioners, typically from tech, to devise solutions to community problems in a day-long problem-solving sprint.

However, this event stood out from similar hackathons and design sprints due to its focus on process. Instead of aiming to create mass, fast-to-market minimum viable products, designers were tasked with outlining solutions that would meet the needs of specific user profiles that had been identified through previous months of stakeholder engagement. In fact, the critical work of the design jam actually took place far before the actual day of the event; in the months leading up to it, designers conducted in-depth interviews with community stakeholders and synthesized their research to identify common barriers to digital inclusion and create profiles of typical users who experience those barriers.

The designers identified both geographic areas where new intervention was needed, such as communities that lacked affordable internet, and situations where a solution such as low-cost internet plans already exists but where the local community was broadly unaware how to access it. This helped designers effectively deliver on specific community needs and avoid duplicating efforts. It also helped designers identify less visible barriers to entry, such as stigma, that may not be properly addressed through traditional methods of outreach. The jam led to a proposed professional network for educators and digital inclusion workers, which intended to serve as "...a place for recognition of best practices and champions and provide hyper-local data resources and analysis for practitioners to understand the digital divide in their specific community." The end result was a holistic approach to closing the digital divide that only a human-centered design process can enable.

Action Item 2: Prioritize and Foster In-Person Outreach

Chief Chuck Hoskin Jr., Principal Chief of the Cherokee Nation, identified the Nation's two critical tech interests as telehealth and the preservation of the Cherokee language. The latter involves efforts to pair elders with youth through teleconferencing, granting young learners the benefit of proximity to a first language speaker. However, enabling Cherokee elders to harness this technology means overcoming considerable barriers of technical education and digital literacy.

“We need more than just a helpdesk for our elders,” Chief Hoskin said. “They can be quick studies, but it’s not just off-the-shelf technical advice. We need to invest in a real, hands-on, sensitive approach to getting people acclimated to tech.”



The solution, it seems, is analog: recruit representatives who are skilled in both the elder's culture and in the use of technology to manage the connection and act as mediators. While deceptively simple, the power of this connection cannot be understated; personal interactions can reduce discomfort around the uptake of new technologies, identify barriers that are unique to the communities they work with, and convey customized digital literacy.

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Other communities have found that in-person connections can also promote uptake among underserved populations. For these reasons, the National Digital Inclusion Alliance promotes the concept of a [Digital Navigator](#), an individual who is tasked with helping the community expand access to both the internet and other technology tools as a critical element of digital inclusion. Such positions can be embedded in institutions that community members already use, such as libraries, public housing developments, and community healthcare services, to ensure that members of marginalized communities are being met where they already are.

Action Item 3: Utilize Already-Available Community Resources

While many think of broadband and tech as the critical infrastructure of pandemic resilience, one roundtable participant lauded a resource that has not gotten as much coverage during the pandemic: senior centers.

These centers had been instrumental in connecting senior citizens with digital resources, since they draw on existing relationships to meet the immediate or future needs of the elderly. “They are the go-to resource for communities when you are planning out digital programs and initiatives,” noted participant Susan Stiles, Senior Director of Healthy Aging Innovations at the National Council on Aging. “They know their audiences really well...and are part of a seamless interaction between services.”

But while such centers can prove invaluable in connecting seniors with relevant technology, their effectiveness has been curtailed by a funding shortfall and COVID closures, reducing their ability to respond to the changing needs of seniors.

“Many senior centers didn’t even have computers with video capabilities,” Stiles noted. “We can’t lose sight of the fact that community orgs need really basic resources. It isn’t just about the latest app.”



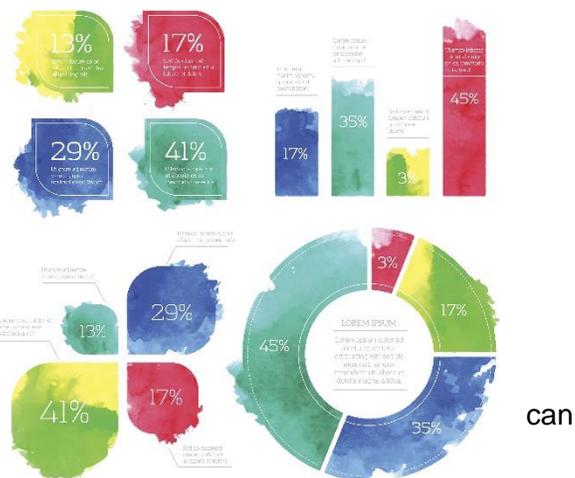
This highlights another challenge in building community infrastructure: many existing organizations that provide critical services—such as digital literacy training or assistance navigating low-cost programs, already exist. But they face severe resource constraints during times of hardship. Investing in resources, such as libraries, senior centers, schools, and other civil society groups, can

help increase community resilience. These are the institutions that can help increase uptake of digital technologies when they are designed with those needs in mind. By involving local institutions that directly serve targeted communities, cities and states can both gain a better understanding of the needs of those communities and enhance those organizations’ capacities.

Data As Infrastructure

It has become increasingly clear that data in the modern age is not only the digital representation of other things, but is itself a form of infrastructure—acting as fuel to power innovation, drive the digital tools our communities rely on, and structure our cities’ distribution of public goods and services. Traffic data, for instance, may power any number of smartphone apps that manage transportation or delivery, thereby shaping the flow of our lives and goods.

Yet, according to a [2021 report](#) by the Harvard Kennedy School’s Ash Center, our current approach to infrastructure repair is “disorganized and patchwork, resulting in unsafe, costly, and inequitable roads, bridges, dams, sidewalks, and water systems.” Their solution: build a system that is thoroughly informed by comprehensive, quality data. “A strategic, smart infrastructure plan that integrates digital technology, sensors, and data not only addresses these issues but mitigate risks and even improve the conditions and structures that shape our daily lives,” the report notes.



Given the promise of data to deliver previously unseen insights, and therefore to solve previously intractable problems, it is little wonder then that so many of our modern innovation and investment decisions hinge on it. As a result, local and state governments must adopt a new set of proficiencies to effectively gather, process, and interpret data, and to ensure that they are mitigating, rather than exacerbating, preexisting inequities and challenges. That begins with identifying which data might be providing relevant insights. It isn’t enough to simply collect and hold data; all relevant stakeholders, notably those from whom the data will be extracted and those involved in service delivery must also have a say in what data is gathered. “Unless you are involved in collecting the data, you are trying to turn forgotten straw into useful gold,” noted Ryan Merkle, Managing Director of Aspen Digital, who previously initiated Toronto’s Open Data project. “If the program staff who deliver the services aren’t partners on the generation side, you’ll never get the data you want.”

The consequences of not adopting these proficiencies can be grave. A lack of granular data on broadband access, for instance, obscures how many people actually have reliable internet connections, reducing funding for reliable broadband programs that would otherwise benefit these communities. As services, ranging from bill payment systems to transportation and communication, are further digitized and data is gleaned from those services, disconnected communities may become further marginalized

from core, social and economic activities. It is therefore important, as stated by Katy Knight, Executive Director and President of the Siegel Family Endowment, that we map out, “how we share, steward, and protect {data}...to keep it from causing the sorts of harms we want to avoid.” This involves recognizing that data cannot be truly unbiased, and that inclusive data necessitates an inclusive design process towards community-targeted efforts.



Action Item 1: Build Data Culture, Not Just Data Capacity

While capacity is discussed as one of the most common barriers to effective data gathering and usage for city and local governments, it may not always be the root obstacle to data-driven organization.

“I remember being in a senior level meeting,” one roundtable participant recounted, “...[when] one senior member raised her hand and said, ‘If we have this data, people are going to expect us to do something.’ There was this concern of information laid bare, and of accountability.”

In other words, increased data publication often leads to increased transparency, and with that transparency may come a push to change the ways governments do business. Shifting to a data-driven operating model requires a shift in commitment to not only to build up data capacity, but to acknowledge and address the problems that the data unearths. A failure to muster this political will may mean that organizations shy away from greater data production and disclosure for fear of upending business-as-usual.

Multiple participants echoed the hesitancy of local leadership to take on a commitment to transparency, and the heavy lift and time investment that go into creating a data-driven organization. As one participant who works in a housing department of a major city put it, his organization “operates in the complete absence of data infrastructure,” which hinders their ability to use data for systemic change.

Building an organizational consensus around data is a critical first step towards operationalizing data as infrastructure. One roundtable participant, who worked in the procurement office of a major U.S. city, stressed the importance of involving external stakeholders in processes where data is a critical dependency, since they are often able to better speak to its importance, and weigh on the government to change its ways.

“Bringing in the vendors—external voices who can explain why data is important to them...and the impact of data, and using data to make decisions on their work—has often been the lever that we need to elevate the conversation and to execute,” she noted.

Action Item 2: Engage Communities to Identify Blind Spots in Data

In marginalized communities, data is frequently sparse due to systematic exclusion from both public resources and engagement. Thus, those most in need of improved public services end up underrepresented in the very data that determines allocations of resources.

The result of this data gap is that as governments make strides towards data-driven decision making, critical voices are left out. Broadband distribution is illustrative of this trend. Form 447, the reporting vehicle that telecom providers use to inform the FCC of coverage rates, bases broadband availability rates on whether service is available in a zip code. The problem, of course, is that zip codes can contain widely diverse populations with different socioeconomic statuses and varying levels of broadband access



or affordability. Additionally, if there's even one residence that *can* be served in a particular zip code, it's considered covered by the FCC.

As a result, community-based advocacy organizations, and even major research institutions like Pew Charitable Trust, have been unable to collect data on key issues like tribal broadband to this day. And yet form 447 may play a crucial role in the execution of the bipartisan infrastructure bill, as data on access are used to determine how to prioritize funding.

"I worry that the failure of that [broadband] data will be exacerbated once the Major Transport Infrastructure Authority and others are forced to rely on it to dole out \$42 billion in federal funding," said Sarah Morris, Director of New America's Open Technology Institute.



In environments like these, data-gathering strategies that involve and intentionally meet the needs of marginalized communities should be employed. One expert in urban tech policy, who served in city government, suggested engaging community organizations that work directly with the target populations as partners in the design and outreach processes. Other forms of direct community engagement include meeting community members

where they are, both physically and in the ways we set expectations for outreach, compensating them for their time, and engaging them through channels they already interact with.

This is not to say, however, that the solution to data inequity is to simply gather more data on marginalized communities in all circumstances. Paradoxically, many of these communities also suffer from histories of over-surveillance, particularly by law enforcement, and may view attempts to collect more data with suspicion and resistance. This is why communities should be partners in their own data production, maintaining a strong level of ownership and sovereignty over the data that is produced and provided to public authorities.

Case Study: Tribal Data Sovereignty

It is tempting to conclude that so many of our communities' problems could be solved if only we had more or better data on the people that inhabit them. To Traci Morris, Executive Director of the American Indian Policy Institute at Arizona State University, however, this approach overlooks the fact that many marginalized communities, particularly Indigenous Americans, are often left out of major data collection initiatives, and are additionally constrained in the data that they are able to

collect themselves. And sharing what data they do have, she notes, risks opening the community to harm.

In 1990, the Havasupai tribe consented to donate blood samples for diabetes research to Arizona State University. The samples were widely shared with researchers in other fields without the tribes' consent. According to [the New York Times](#), the data was used to “study many other things, including mental illness and theories of the tribe’s geographical origins that contradict their traditional stories.” Such disregard for the medical and cultural privacy of members’ data has instilled a lasting aversion to the open sharing of data.

Indigenous data sovereignty, or the assertion of tribes’ right to govern “...who’s counted, how that data reflects the interest of the communities...[and] who has access to it,” as defined by Morris, is an attempt by tribal communities to mitigate harms that come from a fundamental imbalance of data-gathering power in indigenous communities. This imbalance is deeply entangled with the digital divide. “Eighteen percent of tribal residents don’t have internet at home,” Morris noted. “If we have this going on, how do we have data to share?”

In theory, by strengthening the legal control that tribes have over their own data, they can safely allow external actors to help them gather, process, and distribute data, while retaining the ability to stop harmful or undesirable data use.

The consequence is that tribal communities are almost entirely reliant on major institutions and the U.S. government for the gathering and processing of their data, a reliance many are hesitant to maintain given the deep history of harm these institutions have perpetrated.

Nonetheless, the need to gather data remains crucial. For instance, a spike in cases of missing and murdered indigenous women has driven many communities to share crime data across jurisdictions. The hope is that this will help ameliorate the backlog of cases. Other drivers of data sharing include attempts to demonstrate the lack of broadband investment in Native American communities, which affects the distribution of federal funds, or a simple desire of tribes to access better snapshots of their communities’ needs. Despite sovereignty concerns, many communities increasingly recognize that these problems can only be solved with data.

Efforts to strengthen tribes’ data sovereignty often begin with the federal government due to its central role as a collector and disseminator of data on indigenous communities. The U.S. Census, given its breadth and its perceived shortcomings by indigenous advocates, is a frequent target. The Census historically paid little heed to the tribal membership of the indigenous people it counts; the only question on the census that addresses tribal membership, or “enrollment,” is a vaguely

worded question that instructs respondents to ‘print’ their ‘principal or enrolled tribe.’ This question has not historically been successful; in 2010, 20% of respondents left it blank. This has continued despite the urging of indigenous representatives to measure tribal enrollment more accurately, a request the bureau denied, one former advisor to the Bureau noted, “citing insufficient questionnaire space.”

Today, most Indigenous Americans live in cities, rather than on reservations where the connection to indigenous data is more clearly defined. The lack of an effective tribal enrollment question leaves many tribes without a clear accounting of their populations or membership since most tribes lack the resources to tally their respective diasporas. The ability or inability to tally these numbers can be consequential; [more than three hundred](#) self-identified tribes still lack recognition by the federal government, impacting their legal rights and their eligibility for resources. Better indigenous representation and governance over how data about their communities is gathered, therefore, may help account for such shortcomings and help tribes not only exercise sovereignty over their data, but more effectively advocate for their territories and populations as well.

Action Item 3: Establish Standards and Pipelines for Ethical Data

Demographic data is inherently sensitive and at risk of abuse if not carefully handled. Concerns range from privacy to the unfair targeting of vulnerable communities to difficulties with data oversight due to the complicated pipelines that produce data. While governments may be able to establish rigorous standards for the use of data they already have, multiple roundtable participants noted that it is important to ensure that the data supply chain doesn’t create harm before it even reaches the end user.



“The same question applies here as it applies to Nike or Apple: do we trust data suppliers?” asked Daniel Castro, Vice President of the Information Technology and Innovation Foundation.

The risks inherent in the modern data market were illustrated by one participant’s attempt to gather transportation data in their city. A vendor entrusted with managing the city’s sensors changed its data storage practices, leaving them on the wrong side of a new city law on data

anonymization. This led to a decision to sever ties with the company and the sensor technology in favor of purchasing similar data from a third party. However, even the third party’s practices ended up being problematic.

“[The third-party vendor had] some sort of proprietary methodology to collect data that [they] will sell back to you,” the participant noted. “You don’t have to collect data or have devices, you just have to buy data. That raised red flags,” they noted, “We don’t know how the vendor is collecting data. It turns out the ‘easy path’ had a lot of work involved.”

The challenge for city leaders and policy experts, then, involves collaborating across municipalities to begin to build and establish such a framework. The realm of data supply chains standards is a new concept, and will involve the intentional documentation and exploration of trials and errors among the localities attempting to establish such frameworks.

Digital Literacy as Infrastructure

Despite the massive push to get unserved populations online during the early stages of the COVID-19 pandemic, governments at all levels discovered that broadband access does not necessarily result in increased digital uptake.

“Even if you provide families with free internet, they don’t always accept and there are a lot of reasons [why],” noted Doug Casey, Executive Director of the Connecticut Commission for Educational Technology. “Distrust, language barriers, housing, and other insecurities... the broadband theme of ‘if you build it, they will come’ does not hold water.”

“The broadband theme of ‘if you build it, they will come’ does not hold water”

One of the most common barriers to uptake is a lack of digital literacy among disconnected communities. A lack of literacy manifests in ways that even people familiar with information and communications technologies (ICT) may

not anticipate. Trainers for the elderly in computer centers cited the need to dispatch with laptops, in some instances, and replace them with desktop computers using traditional computer mice, since users were unsure of how much pressure to exert on a trackpad. In other cases, citizens may have basic computer literacy, but may not fully understand how using the internet applies to their life and daily needs, occluding further uptake of digital technologies.

But even more critically, we’ve seen a dire lack of *information* literacy, defined by the [American Library Association](#) as the ability to “...locate, evaluate, and use effectively...needed information” among populations who *are* connected - especially during the COVID-19 pandemic. Communities struggled to sort through conflicting health mis- and disinformation, exposing vulnerable communities to false and often dangerous information in newly crammed and hotly charged online forums. Instances such as these highlight the truly infrastructural dimension of literacy; while technology itself may enable society to

perform certain functions, the manner, quality, and effects of using digital technologies are predicated on the quality of a community's ability to both use and understand it.



Action Item 1: Embed Literacy Training in Core Public Services for all Ages

Underserved children have historically been at the center of digital literacy efforts, a focus which makes sense, considering how contingent their career prospects will be on their digital skills. As one participant reminded the roundtable, however, it is critical that we “don’t forget the adults.”

According to a 2018 U.S. Department of Education [study](#), 18% of American adults age 18-65 are digitally illiterate, meaning they are unable to perform basic online tasks such as making an online purchase or sorting through emails. These adults are more likely to be older, people of color, and/or immigrants - all factors which also may put them in more precarious situations in the offline world. Reaching these adults is especially critical, as increased digital literacy can help promote uptake of related services, such as career, healthcare, and educational opportunities.

Karen Mossberger, Professor at the School of Public Affairs at Arizona State University, suggested that the solution is reaching these individuals through the services they already use regularly. “[We] have an opportunity to...integrate these into existing programs. Workforce development came up, public housing came up, but how, when we engage with citizens around participation online, can we integrate support for skills, learning new things, looking at information, judging, etc.?”

Jason Hardebeck, Director of Broadband and Digital Equity at the Baltimore Mayor’s Office, noted that we should “make sure we are building these things into how we interact with citizens. It’s better to learn a skill when you need it...Part of our goal is to deliver just-in-time training, building workforce development into how we build our infrastructure.”

Case Study: Housing Authority of the City of Pittsburgh

As the organization in charge of public housing and housing assistance in Pittsburgh, the Housing Authority of the City of Pittsburgh (HACP) serves more than 20,000 residents citywide, many of them elderly and with very limited digital literacy skills. Like many housing authorities, HACP has residents scattered throughout its city, making a centralized training location impractical.

Enter the HACP’s [Mobile Computing Lab](#), an effort to bring technology directly to residents where they live - literally. The mobile lab operators physically bring the computers to the residents’ buildings, allowing access to machines and software residents otherwise may not have . It serves seven of the HACP’s largest high-rise buildings, targeting mainly seniors, and offers courses on everything ranging from computer and internet basics to the finer points of Microsoft Suite.

Further advancing HACP’s mindset of meeting its customers where they are, the Mobile Computing Lab took steps in 2020 to integrate health literacy training into its digital literacy program, ensuring that it was providing residents with needed services. The organization partnered with the University of Pittsburgh’s Pitt Health Sciences Library System and the National Network of Libraries of Medicine, gaining the funding it needed to introduce additional staff and resources, and reached more senior citizens with training than ever before.

The program specifically integrated an introduction to MedLine Plus, a resource that provided everything from specific health information to healthy recipes. Equipping residents with the skills to navigate digital tools, as well as offering timely and relevant use cases that directly addressed the needs of the participating communities, allowed the program to deliver impactful services to its target communities

Action Item 2: Place Marginalized Communities in the Driver's Seats of Digital Literacy Strategy

A core revelation from our discussion was that digital literacy is inherently tied to questions of representation. Technology, designed with a specific type of user in mind, does not necessarily reflect the needs or realities of marginalized communities that are not represented in their creation further racializing the digital divide.

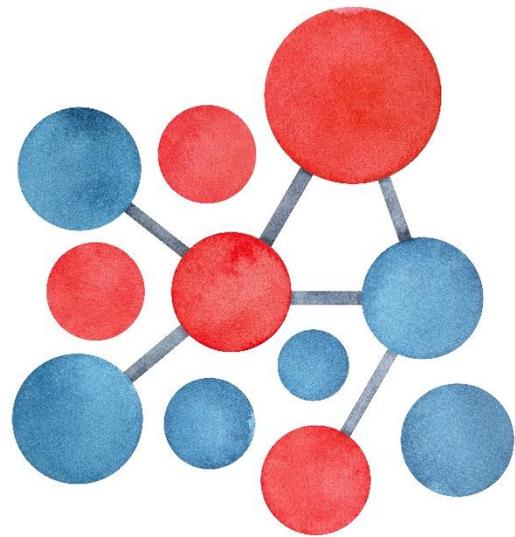
"It's framed as the digital divide, but I want to frame it as...not seeing the full human," suggested Brandeis Marshall, CEO of Dataedx Group. "White people are going to have to realize that they are part of the problem, that they don't put Black people in spaces, that they don't put Latina people in spaces, that they don't put indigenous people in spaces... That distribution of power is necessary."

The solution is to establish representatives of marginalized communities as core decision-makers regarding digital resources that serve their communities. This involves including them both at the distribution stage—making certain that community leaders, rather than simply major broadband providers, have a say in how digital divide funding is allocated—and at the implementation stage, allowing local leaders to determine how best to tackle digital illiteracy in their own communities.

This will ensure that the aspects of our modern, digital platforms that exclude or present additional difficulties to marginalized groups are directly addressed in our solutions.

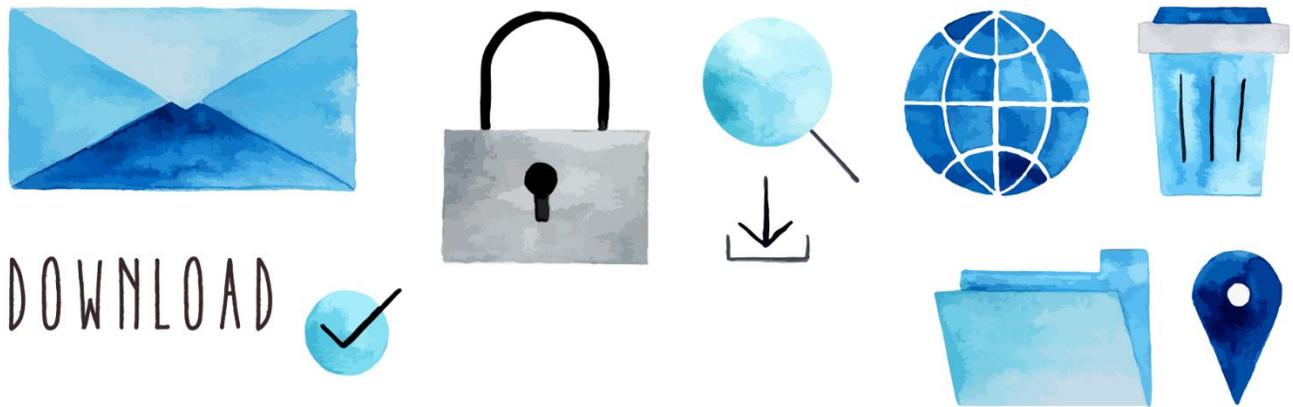
Caitlin Cain, Vice President of the Local Initiatives Support Corporation (LISC) and Executive Director of Rural LISC, noted that empowering local leaders to create learning hubs can combat trust issues inherent in communities hurt by the digital divide "When we're thinking about digital literacy, it is important that we are creating leadership within these communities so folks can understand who they can go to in moments of crisis, and trust that information because it's coming from someone they can respect."

This is especially important in communities of color, which, in addition to disinvestment, face the daunting prospect of navigating platforms that often weren't created with their needs in mind. This further dissuades the uptake of digital services and inhibits the development of literacy in those communities.



“Many times people know about platforms but don’t want to get [on them] because it’s another identity they have to manage—marginalized communities [are wary of] spaces that aren’t designed [with them] in mind,” stated Marshall.

A focus on adult education, Marshall contended, especially in the context of this community’s particular needs, can help users to develop the literacy necessary to overcome their own barriers to digital adoption and full participation. Ensuring that this education is specifically tailored to the unique barriers that digital platforms and tools pose to marginalized communities is key to its success.



Action Item 3: Hold Platform Developers Accountable

Though digital literacy is crucial for the effective use of technology, roundtable participants stressed that individual literacy is only one piece of the constellation of interventions needed to bring about a more inclusive digital society. . In order to truly orient our digital infrastructure in the public interest, we have to also address its underlying structural problems, such as mis- and disinformation, hate speech, and even human rights abuses. To do that, we need tech platforms to do their part.

Social media platforms like Facebook and YouTube have been key vectors of pandemic mis- and disinformation, algorithmically amplifying inaccurate-yet-snappy headlines and misleading or fully fabricated content. Some pandemic misinformation outlets, such as the anti-vaccine World Doctors Group, gained an audience [increase of 13.215%](#) since the start of the pandemic, marking the incredible draw that pandemic information has had for so many.

The exact way to address the role of platforms is the subject of much debate, and unfortunately leaves little room for action by state and local governments, outside of calls for greater awareness. Solutions range from greater advertising transparency to a more robust overhaul of Section 230 of the Communications Decency Act, which exempted companies from responsibility for what is posted on their

platforms. The only sure thing is that some reforms targeting these giants will be part of a broader misinformation solution.

The results of such efforts will also determine and shape what digital literacy efforts of the future look like “There was a fleeting period during pandemic when a number of actors, including major platforms, started to take information quality seriously,” said Andy Guess, Assistant Professor of Politics and Public Affairs at Princeton University “We saw what it could look like when it became suddenly a bit easier to navigate the online information environment.” In order for digital infrastructure to become what we now know it is - a public good - we need systemic solutions for governance and regulation, as well as accountability for those who abuse it.

Conclusion

The successful passage of the Infrastructure Investment and Jobs Act provides a once-in-a-generation opportunity to bridge our nation's persistent digital divide and to ensure that all people, especially the most marginalized among us, can participate in society as full digital citizens. Given the broad latitude allowed to states and localities in the use of these funds, it is essential that policymakers recognize the multidimensional nature of the digital divide; while access is critical, quality, affordable broadband should be centered as a key *piece* of this puzzle as providing access alone will not spark total digital uptake, nor will it allow communities to effectively provide the services that their citizens need.

A multi-pronged approach that focuses on engaging communities in the creation of the tools intended to help them, ensuring that data, the lifeblood of our modern digital transformation, is governed equitably and ethically, and enhancing digital literacy for the most vulnerable, will ensure that we navigate effectively from access to digital citizenship, and build the digital infrastructure that our communities need.

Implementing many of these changes involves not only a shift in our priorities and conception of *what* digital infrastructure is, but also a change in *how* digital infrastructure is designed, accessed, and utilized. A top-down approach that involves the same actors, contractors, and partners that have guided our efforts in years past will not yield different results and will not resolve the digital inequities that have plagued us for far too long. To effect change, policymakers must intentionally involve marginalized communities in infrastructure planning at every stage of work, from the conception of what our priorities should be in the first place, to the execution of projects and the disbursement of funds. Only when these stakeholders play an active role in the shaping of their own destinies will we manage to achieve true digital equity.

In conclusion, we hope that this conversation sparks a reckoning with the full, multidimensional picture of the challenges that await us, and helps muster the will to fulfill the incredible promise offered by our new, epochal investment in digital infrastructure.





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