A Public Housing Digital Inclusion Blueprint

Monkeybrains and San Francisco Deliver a Sustainable Gig

By Hannah Rank and Christopher Mitchell

@sreknar    @communitynets
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Authors

Hannah Rank is a researcher and current Master’s in Public Policy student at the Humphrey School of Public Affairs.

Christopher Mitchell is the director of the Community Broadband Networks initiative at the Institute for Local Self-Reliance.

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Introduction

Urban areas today have nearly universal, albeit pricey broadband Internet access from cable companies as well as a mix of additional service providers, varying from neighborhood to neighborhood. Connectivity is divided along socioeconomic lines, with fewer options available to those who have less capacity to pay for the service. Many low-income households simply cannot pay for decent Internet access.

Such was the case in two affordable housing complexes in San Francisco, near the heart of the tech industry in Silicon Valley: Hunters Point East and West (HPEW) in the Bayview-Hunters Point neighborhood and Robert B. Pitts in the Western Addition neighborhood. Most residents of these and other affordable housing buildings cannot afford the price of high-quality Internet service commonly available. According to the San Francisco mayor’s office, around 100,000 residents still lack adequate Internet access (about 1 in 8 of those living in the City and County of San Francisco).¹

Enter Monkeybrains, an Internet service provider (ISP) operating in San Francisco for 20 years. When they heard about a renovation to HPEW that included contract bids to revamp Internet connectivity, they put in a revolutionary offer. Monkeybrains proposed and is now providing to-the-unit 100 Mbps (megabits per second) connectivity to the housing complex with an approach that ensured low startup and maintenance costs, as well as sustainability for future generations of residents in HPEW. When the City came onboard with its dark fiber at another location, Robert B. Pitts, Monkeybrains was ready to help provide that site with gigabit access to each unit.

The lessons from Monkeybrains’ approach should inform policy in every urban region. San Francisco isn’t the only city with digital equity issues. One of the largest ISPs in the U.S., AT&T, has been accused on numerous occasions of “digital redlining:” focusing high-speed Internet investment in metro areas or wealthier regions and ignoring regions with high concentrations of poverty.² In a staggering report, called “AT&T’s digital redlining of Cleveland,” Connect Your Community mapped out where the incumbent ISP had upgraded connection speeds in Cuyahoga County, which houses Cleveland. The organization demonstrated that AT&T had not upgraded connections in low-income census blocks in Cleveland proper, especially in those areas with 35 percent or higher poverty rates.³

Several of the large legacy cable and telephone companies like AT&T and Comcast have programs for households that meet specific requirements for a slow (5–15 Mbps) but affordable connection. Some, including CenturyLink, have started a program and then killed it.⁴ Comcast has continued its Internet Essentials program even after the requirement to offer it expired years after its NBC acquisition. AT&T is required to offer its program, Access, until 2020 due to its DirecTV acquisition. Access and Internet Essentials offer $10 per month programs and free modems for families on a variety of government
assistance programs. AT&T’s Access may be as low as $5 per month in premises stuck with obsolete connectivity slower than 5 Mbps. Comcast has recently expanded its Internet Essentials program to include other types of qualifying customers, including low-income and veterans’ families. But critics have panned the service for not meeting broadband speed standards and including many roadblocks to service such as disqualifying families with past overdue bills to the company, among others.5

Despite efforts to close the digital divide, at least one fifth of those Americans not currently using the Internet cite the prohibitive costs associated with access.6 The program to connect HPEW and Robert B. Pitts to high-speed Internet provides two important examples of how some innovative thinking, organization, and commitment from various stakeholders can make high-quality Internet access a reality for low-income households. As San Francisco continues on its path to shrink the digital divide, other municipalities could use this model and follow suit.

The Players

**Monkeybrains**: A local ISP operating in San Francisco since 1998.7 It provides a “hybrid network” of high-capacity fixed wireless and fiber optic cables to offer Internet access. The ISP offered to provide in-the-unit access at two affordable housing complexes in the city, Hunters Point East and West and Robert B. Pitts, at no charge to residents. Monkeybrains’ name was chosen in a time when independent ISPs were more common and more irreverent, but has now become memorable.

**Property managers/owners**: The companies who own and manage these housing complexes can gain access to funding for improvement projects—such as those that enable high-speed Internet access—through a variety of government grants, as explained below. Housing providers may not have much expertise in this area, requiring education and motivation to ensure these investments are made correctly so that building units can easily be connected by an ISP like Monkeybrains. Monkeybrains worked hard to communicate with entities such as the San Francisco Housing Development Corporation (co-owner of HPEW) to convince them that in-unit Ethernet access was not only necessary, but also affordable and comparatively easy to do.

**The City and County of San Francisco**: The Mayor’s Office of Housing and Community Development (MOHCD) began coordinating with the Department of Technology (DT) to expand and install last-mile fiber connections from the city’s backbone to other affordable housing units being renovated in San Francisco. The City’s Department of Technology and Office of Digital Equity ran point on the second major project, the Robert B. Pitts complex. Though both HPEW and Robert B. Pitts’ connectivity improvements happened after initial renovations, the City since has streamlined efforts to ensure wiring changes occur simultaneous to housing complex renovations. DT has plans to connect more than 20 additional public housing complexes in fiscal year 2019–2020.8 The Digital Equity program also incorporates hooking up public housing complexes to high-speed Internet, as well as providing technology labs and digital skills training.9 Building these relationships and developing the wiring standards took time and trust—they did not simply materialize because it was a good idea. One key to the success of the Digital Equity office is a full-time staff person who can dedicate time to building relationships.

**Community Tech Network**: Community Tech Network (CTN) is a nonprofit organization based in San Francisco and Austin, Texas, providing digital literacy training to individuals who want to become better versed in using modern technology and the Internet.10 CTN’s work represents another integral component to digital inclusion in addition to removing barriers to accessing high-quality Internet. The organization focuses on educating people to help them gain fluency on the
Internet and understand the importance of having and using this tool. Preston Rhea, Director of Field Operations at Monkeybrains, had for two years been on the CTN Board of Directors and heard about the bid opportunity from his connections there. The organization began working at Hunters Point in June 2018.

**Definitions**

**What is Digital Equity?**

The National Digital Inclusion Alliance (NDIA) defines digital equity as “a condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy and economy.”¹¹ Digital inclusion practices help communities to reach a state in which everyone has equitable access. These practices elevate those who most need help in accessing communication technologies. Inclusion efforts involve getting people an affordable, reliable, and fast Internet connection, a device they prefer to access it on, and training for them to utilize it in the way that they want and need.

Communities large and small, rural and urban, have residents who lack adequate access to digital services and Internet connectivity. Monkeybrains provides HPEW residents access to in-unit Ethernet connections in addition to shared Wi-Fi. Shared Wi-Fi is more common in public housing but a household could be limited to crawling speeds or non-functional connectivity depending on the unit’s location in the building or how much bandwidth the neighbors are using. Free building-wide Wi-Fi is a nice amenity. However it does not, on its own, reach the goal of full digital inclusion today and will likely be insufficient over the lifetime of these buildings.

**What is Broadband?**

The Federal Communications Commission defines broadband as speeds of at least 25 Mbps for downloads and 3 Mbps for uploads. The term “broadband” defines a minimum standard for a connection that allows a modern household to use commonly used applications without too much congestion. However, there are many benefits to higher capacity connections and communities absolutely need to have access to more than the minimum to thrive in the digital era.¹²

**What is Wireless?**

Wireless technology works by connecting devices via radio signals using one of many standards like Wi-Fi, Bluetooth, or microwave links. Wireless is typically subdivided into fixed and mobile wireless technologies. Monkeybrains predominantly uses fixed wireless for its services: HPEW units originally transmitted information via a cat5e cable from the unit to the roof, then over fixed-wireless into the Monkeybrains core network, and finally over fiber optic cables to the rest of the Internet. San Francisco later connected HPEW to municipal fiber.

a. **What is Fixed Wireless?** The network often uses antennas permanently installed on rooftops or towers that communicate with other stationary or “fixed” antennas. This approach can result in high-quality access in both urban and rural regions, though extreme weather conditions or interference may decrease throughput. Point-to-Point (PTP) wireless involves a pair of dishes pointed at each other to create a direct network connection.
through the air. This configuration maximizes throughput and can be used in the core of the network. Point-to-Multipoint (PTMP) allows one access point to talk to multiple other nearby devices at the same time. Wireless ISPs (WISPs) usually use a combination of PTP and PTMP. Hunters Point East and, separately, Hunters Point West, each have their own PTP uplink. Bandwidth is distributed across the campus to each building via aerial fiber, connecting switches at each apartment building.

Monkeybrains uses two types of radio dishes for its HPEW uplink. The airFiber24 has a link distance range of around 8 miles, whereas the Siklu EH 1200 can link with dishes around a mile away.13

b. **What is Wi-Fi?** The terms wireless and Wi-Fi are often used interchangeably but are distinct. Wi-Fi is one type of a wireless technology. Wi-Fi is a specific set of wireless protocols commonly used by computers and mobile devices. Many different firms manufacture Wi-Fi devices that meet standards to communicate with each other in the 2.4GHz and 5GHz spectrum.14

**CASF Funding**

The California Advanced Services Fund (CASF) provides state-allocated funding to close the digital divide. The California Public Utilities Commission (CPUC) distributes the funding, which comes from a small surcharge on telecommunications users’ utility bills. Since the fund was enacted from legislation in 2007, the surcharge has ranged from 0.14 percent to 0.56 percent and has helped secure hundreds of millions of dollars for the expansion of broadband access and adoption across the state.15 Both rural and urban communities are eligible for CASF funding, though effectively only rural areas have been eligible for infrastructure funding in recent years.16

CASF currently allocates funding from four accounts: the Broadband Infrastructure Grant Account, the Rural and Urban Regional Broadband Consortia Grant Account, the Broadband Adoption Account, and the Broadband Public Housing Account.

The Broadband Public Housing Account provides grants and loans to public housing agencies and nonprofit organizations to connect publicly supported housing developments with broadband access. SB 745, passed in 2016, limited eligibility for Public Housing Account infrastructure funds to “unserved housing developments” where “at least one housing unit within the housing development is not offered broadband Internet service.”17 The CPUC has interpreted that to mean that the unit “does not have access to a commercially available broadband Internet service, such as Digital Subscriber Line (DSL), a cable modem, or another protocol, available at the unit,” regardless of price or quality.18 Since SB 745 came into effect, the CPUC has not received any new applications for infrastructure funding from the Public Housing Account.19

Implementation of SB 745 essentially prevents underserved public housing communities from partnering with providers like Monkeybrains to access CASF funding because the relevant definitions ignore whether broadband is functionally available (i.e., affordable). Additionally, the law gives incumbent facility-based providers the opportunity to upgrade existing broadband access before the CPUC awards CASF funding to infrastructure projects in those areas.20 As a result, innovative approaches like Monkeybrains’ have been discouraged in favor of the status quo of Wi-Fi in hallways from the big providers.
RAD

Rental Assistance Demonstration (RAD) is a program run in the Department of Housing and Urban Development (HUD). HUD is a federal agency that focuses on housing needs, enforces fair housing laws, and runs grant and loan programs subsidizing homeownership and renting. Toward the end of the Obama Administration, HUD implemented a rule that states new construction or substantial rehabilitation of multi-family rental properties funded or supported by the agency must include installation of broadband infrastructure. The rule further mandated that each dwelling unit have broadband access capability meeting the FCC broadband definition.

With the RAD program, public housing stock is transferred to the private sector and becomes Section 8 housing with a long-term contract. “Section 8” refers to an assistance system wherein a certain amount of qualifying residents’ rent will be paid by the public housing authority, through HUD. With the transfer from public to Section 8 housing, the property becomes eligible for debt financing and other funding tools, provided the new housing manager will make the necessary improvements to the units and that the improved units remain affordable (at 30 percent of a resident’s income).

Quick Facts About Hunters Point and Robert B. Pitts

Both Hunter’s Point East and West and Robert B. Pitts housing complexes are forms of public housing. People eligible for public housing can make up to 80 percent of Area Median Income (AMI) based on their family size. Housing units, which are operated by local public housing authorities and/or part of the Section 8 voucher program, set rents based on 30 percent of each household’s income, though many have a minimum rent threshold, which in San Francisco is $25 per month.

Hunters Point East and West

Year Built: 1954
Number of Units: 213 (1BR: 17; 2BR: 122; 3BR: 35; 4BR: 29; 5BR: 9; 6BR: 1)
Co-Owner: San Francisco Housing Development Corporation
Housing complex and neighborhood description: Hunters Point consists of fourplexes and six-plexes on three sites, and sidewalks connecting the housing to open areas and a basketball court. Several blocks of other residential housing separate the east and west sites. The Bayview-Hunters Point neighborhood is next to a naval shipping port that was integral in World War II and was later infamous as a site for a nuclear waste cleanup. Bayview and Hunters Point have historically been a predominantly African-American neighborhoods.

Robert B. Pitts

Year Built: 1991
Number of Units: 203 (2BR: 78; 3BR: 114; 4BR: 11)
Owner: Related Companies, California
Housing complex and neighborhood description: Robert B. Pitts housing units span one-and-a-half city blocks and cluster around parking lots, playgrounds, communal spaces, and a basketball court. The units are detached and vary from two to three stories. The neighborhood where Robert B. Pitts stands is called Western Addition, once a stronghold for San Francisco’s African-American community and jazz scene—it houses the famous Fillmore jazz club. In the 1980s the neighborhood underwent major redevelopment and eventually became gentrified. Now it’s home to mainly working-class families, as well as younger people looking for affordable rent.
Part One: Monkeybrains & HPEW

The San Francisco Housing Development Corporation (SFHDC) took over Hunters Point East and West in 2014, thereby making the complexes eligible for Rental Assistance Demonstration (RAD) funding assistance. SFHDC is a nonprofit housing developer and financial services organization formed in the late 1980s by residents frustrated with the displacement of people of color they saw in their community.

The non-profit, along with housing developer the John Stewart Company, began renovation of the complexes in 2016. SFHDC then began temporarily relocating residents and was soliciting bids to update each building’s Internet connectivity.

Monkeybrains wasn’t initially aware of the upgrades sought at Hunters Point East and West. Community Tech Network (CTN) had begun working with SFHDC to start a digital literacy training course for residents at their housing complexes, including HPEW, and through that partnership heard about the bid request SFHDC made. Monkeybrains’ Director of Field Operations Preston Rhea caught wind of the bid request through his work on the CTN Board of Directors.

Comcast had bid on the project, proposing a single Wi-Fi access point for each building for which the development owners would pay approximately $200/month. At 27 buildings total, HPEW would rack up an estimated yearly bill of nearly $65,000. Monkeybrains staff knew they could offer a better solution at a much lower price point that would provide far better access to everyone in HPEW for years to come.

The local ISP’s plan was to offer free installation of wireless access points as well as wired access to each individual unit. SFHDC would pay $10 per month per unit to Monkeybrains for the first two years, but there would be no cost to the residents. With 213 units at $10 per month, the total cost to SFHDC runs just under $26,000 per year—half of what Comcast bid for an inferior option. After that, Monkeybrains could donate the bandwidth, extend the agreement with SFHDC, or offer a low-priced service directly to the residents. Monkeybrains takes helpdesk calls from these residents just like they do for any other customer.

While in the process of renovating and securing the Internet upgrades after winning the bid, Monkeybrains realized that the Internet connectivity upgrades could tap into funding from the California Advance Services Funding (CASF). They secured nearly $80,000 worth of funding from CASF for the installation costs at HPEW that allowed them to also include Wi-Fi in each building in addition to the in-unit connections. As noted above, CASF now significantly restricts funding eligibility for projects like this because of changes in state law.
Internal Wiring

Ongoing renovations at HPEW simplified the network installation process. Monkeybrains said the project upgrade from hallway Wi-Fi to in-unit Ethernet access was “as simple as a change order.” The contractors happened to be pulling new cat5e wiring to each unit for their telephone systems, but were using a specific type of jack that only supports landlines. Depending on how these types of wires are installed in the unit, they can either support generally slower DSL telephone connections or, with the new jack Monkeybrains requested, Ethernet connections at 100 Mbps and regular telephone connectivity simultaneously.

“This simple change order added almost no cost, but would have been a giant hassle and expense if done later,” Preston Rhea explained. “We were able to install a simple Ethernet switch in each building. Now we have a Local Area Network (LAN) interconnecting the units in each building.”

While the current wiring in the buildings supports 100 Mbps symmetrical, Monkeybrains could have let the contractors know that they should pull two cables instead of just one if they had more advanced knowledge of the renovation. The ISP says if residents want to upgrade to 1 gig and do not need to use their landline for telephone service, Monkeybrains will send a technician in to re-punch their jack to offer 1 Gbps at no charge. To date, no one has requested this change.

Though communication between the ISP and SFHDC allowed for a streamlined installation process, they could have cut even more costs if they had been in contact sooner. Running fiber between the 27 campus-style buildings and egress into each would have been less expensive during the major construction phase when other utilities were also being upgraded. Likewise, wiring to each unit would have been less expensive when crews were already doing similar work rather than after the fact.

Category 5 Wiring (Cat5)

Though we don’t often consider the Internet as a physical structure, people ultimately tap into the network via wires a vast majority of the time. Prior to the Internet age, homes had wiring connecting their telephones to the poles outside. Now, people can wire both for Internet and phone systems with something called category 5 (cat5) cables.

Hunters Point East and West had undergone major renovations around the same time Monkeybrains became their ISP. These renovations included wiring upgrades. The type of wiring used in HPEW was cat5e, which supports speeds of up to 100 Mbps when shared with a landline. Had Monkeybrains and the developer coordinated sooner, they could have installed two cat5e wires instead of one, allowing for 1 Gbps symmetrical speeds and a landline. For future-proof wiring, cat6 wiring may be a better choice now.

“That was an awesome program ... I’ve been working my whole life, and at the time [of this program], I had lost my job of 26 years, and I was having a hard time. I needed a job to go back to college and keep on going. Kudos to that [program].”

–Hunters Point West resident, quote courtesy of City and County of San Francisco.
Doing It Right

Mason Carroll and Preston Rhea, lead engineers for Monkeybrains who worked on both the HPEW and Robert B. Pitts project, underscore the importance of not simply installing building-wide Wi-Fi access. They wanted to offer the same high-quality service to affordable housing units as all their customers expect.

“This was our approach from the beginning—don’t offer them different service, provide the same quality service and infrastructure we offer every client. A lot of other ISPs would prefer to package things differently for clients that won’t pay them a standard rate—just drop Wi-Fi and call it done,” Rhea and Carroll said. “That approach only invests money to further cement the digital divide by establishing different classes of communications infrastructure for different classes of residents.”

Wi-Fi in the hallways is a nice amenity, but is not a sufficient long-term solution for connecting the households in these buildings. Because the Internet is shared by all residents in the building, which could house a dozen or so families, heavy use in a few households can cause severe slowdowns for others. In addition, shared Wi-Fi can be less secure than a private connection, and quality of service can also vary tremendously depending on the unit’s physical location with regards to the Wi-Fi access point. As more residents depend on telemedicine in coming years and are generally more connected, hallway Wi-Fi may not adequately meet standard needs.

Though building-wide Wi-Fi may seem like an easier lift, Monkeybrains says that with the right planning, in-unit connectivity can be as simple and does more to bridge the digital divide. Getting the wiring right from the start may be the difference between a sustainable low-cost, high-quality Internet solution and paying more for significantly less robust shared Wi-Fi.

With proper design, a building can accommodate multiple ISPs in the future that may serve different niches. Switching providers could be as easy as moving an Ethernet cable in the server closet from one switch to another. Remember that these buildings are expected to last for decades—any assumptions about these households being less technically sophisticated due to poverty will not stand the test of time.

Connecting From Point A to B

Monkeybrains uses both fiber optic and fixed wireless technology, due to the cost and permitting issues associated with fiber installation digs in a bustling municipality such as San Francisco. In a 2017 interview on ILSR’s Community Broadband Bits podcast, Mason Carroll noted that part of the benefit of wireless in a fast-moving city is its ease of installation.31

“What’s nice about the wireless technology of what Monkeybrains can do is in a matter of 48 hours if necessary we can come out, install a licensed radio link in a point-to-point topology, and we can deliver full gigabit speed really, really quickly,” Carroll said. Some customers have asked for a fiber connection but changed their mind after experiencing the wireless service.

Monkeybrains may decide to bring fiber to a building if it is using a lot of capacity or is just geographically well-suited to feed nearby radios. Building fiber is expensive—rarely more so than in a crowded city like San Francisco—and the uncertainty of permitting time is a challenge.
Wireless capacity can be harmed by interference from other radios, heavy precipitation, or the construction of an inconveniently tall building between two radios. To avoid the latter, Monkeybrains continuously tracks large new buildings in the vicinity of their network.

Whether connecting affordable housing or a commercial client, Monkeybrains needs a high-capacity connection from that location to a data center called by its address, 200 Paul Avenue. This is where information goes from inside the Monkeybrains network to the larger Internet. As the city of San Francisco builds more fiber paths that a partner like Monkeybrains can use, the cost of getting to 200 Paul decreases.

Robert B. Pitts is seeing a 95th percentile usage at 110 Mbps with traffic spiking to 400 Mbps. Hunters Point East and West are each seeing 95th percentile usage at 50 Mbps with traffic spiking to 200 Mbps. Measuring at the 95th percentile is a common metric in networking to measure peak network usage. Traffic is growing quickly as more people use the service, all of it well within the capacity of its hybrid fiber/wireless approach.
Part Two: Streamlined, City-Supported With Robert B. Pitts

Drawing on the momentum from the success of the HPEW project, the city began a pilot program to improve digital access in affordable housing complexes elsewhere in the city, starting with the Robert B. Pitts housing complex in the Western Addition neighborhood. Originally, Monkeybrains used its hybrid wireless and fiber network to backhaul access from HPEW to the rest of the Internet. Specifically, Monkeybrains used fixed wireless on HPEW rooftops to interconnect HPEW into its local network.

The public safety team within DT recognized the benefits of connecting these facilities directly with the City’s fiber as backhaul. The Office of Housing and Community Development approached DT and Monkeybrains about working on Robert B. Pitts and Hunters Point West (one of the buildings in the HPEW complex) as the city itself was planning to build out the fiber to the buildings and needed an ISP partner. Hunters Point East eventually received fiber as well.

The project involves San Francisco and Monkeybrains splitting responsibilities. The City gave significant resources to redo the faceplates at Hunters Point East and West so each unit would have at least 100 Mbps. DT rewired Robert B. Pitts to allow gigabit Internet connections. Monkeybrains donated all the hardware, switches, and core required to light the fiber as well as labor to bring the households online.

In HPEW and Robert B. Pitts, the Mayor’s Office of Housing and the Department of Technology had begun to coordinate efforts, allowing them to intervene earlier in the construction process and reduce the cost of network installation. For example, they were able to join forces on other RAD projects, like Mission Dolores and Westbrook Apartments.

Monkeybrains estimates that its costs, which it donated, in setting up Robert B. Pitts were approximately $20,000, split approximately evenly between hardware and labor. Those costs are unrepresentative because the 34 buildings require more hardware than if the 203 units were in a single building. A similar project (with 91 units) in a single building—Mission Dolores—is estimated to cost about $6,000 and took two days to set up.

The costs to the building owner vary based on the type of project or renovation. In new construction, the one-time costs may be up to $100 per unit to run one or more wires or install conduit for low-voltage communication wires. In other renovations, the costs can vary greatly based on the scope of the renovation and whether the units are occupied when the work is done. If cables are already being
strung as part of a project, an additional cable should not cost much, but this can also depend on the cable pathway, if any are available. Most of the costs involved are labor as the materials are relatively inexpensive. Regardless, these one-time investments are needed to enable Internet service providers like Monkeybrains to build business models offering very high-quality services at very low prices to qualifying households in a financially sustainable manner.

One of the challenges with keeping operating costs low in providing Internet access to low-income households is tracking devices like the home routers that plug into the wall and may create a local Wi-Fi network. Monkeybrains did not want to be in charge of that issue as families move in and out. DT and the Office of Digital Equity set up a program to give routers to residents so Monkeybrains does not have to spend time and money tracking who has them. Google donated 100 Wi-Fi routers to this program and Monkeybrains donated 132 routers. These donations allowed residents to connect without having to supply their own. In Wilson, North Carolina, where the municipal fiber network Greenlight provides service to the public housing authority, the authority handles the routers. The private company US Internet has developed its own approach in Minneapolis, attaching a small router that looks like a thermostat to the wall in apartment buildings it serves. Making router management easy can lower the operating expenses of providing Internet access in a multi-tenant building in meaningful ways.

Seeing the success of the projects in HPEW and Robert B. Pitts, the city’s Office of Digital Equity developed a pilot program supporting not only high-speed Internet access in public housing, but also companion digital literacy and adoption training. When combined, the three components of access, adoption, and literacy to those underserved communities go the furthest to close the digital divide.

Digital Literacy: Where the Rubber Meets the Road

A fast, affordable connection is a key part of bridging the digital divide for lower income populations. However, once people are connected to high-speed Internet access, they need literacy to maximize benefits and safety.

Community Tech Network (CTN) has been doing digital literacy work for nearly 20 years. CTN started back in 2001 as a program of TechSoup, received 501(c)3 status in 2008, and expanded from San Francisco to Austin, Texas, in 2017. Kami Griffiths co-founded and currently directs CTN. She, along with her team of volunteers and digital literacy instructors, work with partner agencies—such as libraries, senior centers, and affordable housing—to provide services to individuals who historically have lacked adequate Internet access.

For the past three years, with support from the California Advanced Services Fund, CTN has worked in affordable housing developments to promote access to the digital world through training programs that focus on basic digital literacy: email and Internet safety, job searching, and social media connectedness.
are the main priorities. Participants often are lower income, older, may have disabilities, or speak a primary language other than English. At the end of the three-part, eight-hour training, those who complete it get a free device to join the newly-understood Internet. With support from the San Francisco Department of Aging and Adult Services (DAAS), CTN also offers one-on-one responsive tutoring to walk-in clients at computer labs within the partners’ spaces. CTN operates in more than 20 affordable housing complexes in the Bay Area, both senior and multi-family residential developments.

For the first six months that CTN offered services at Hunters Point West (HPW) and Bayview, their partnership with the city helped them graduate 17 students from their training program. CTN still operates on those housing sites, and since March of 2018 an organization called <dev/Mission> began offering IT training and coding classes to young adults in the development. <dev/Mission> partners with the City and County of San Francisco’s Committee on Information Technology for work at HPW and Robert B. Pitts.38

CTN, <dev/Mission>, and housing managers pick up where ISPs like Monkeybrains leave off by promoting adoption of technology and digital literacy after the barriers to access have been eliminated. CTN also helps lighten the load of customer support for Monkeybrains, which keeps their operating costs low enough to offer fast access at such low prices.

Key Takeaways

If you want to get a program like this going in your city, here are key points:

• Find a local champion—someone who either understands this technology or is excited to dive into it and immerse themselves in best practices.

• Find good partners with the right incentives. Some ISPs will be enthusiastic about projects like these, while others (from small to large) may pass. Understand what motivates your potential partner.

• Research funding options: Plenty of states have created programs to subsidize Internet access but few are available for urban residents. Consider reaching out to foundations and explain that smart one-time expenditures can create ongoing self-sustaining high-quality Internet access.

• We can help if you need some pointers, but be sure to also look into the National Digital Inclusion Alliance (NDIA). For resources on municipal fiber, whether for Institutional Networks or citywide and everything in between, visit MuniNetworks.org

Monkeybrains technicians Forrest Timonere and Leslie Birmingham discuss Internet delivery with Leo Sosa of <dev/Mission> in the community room at the 1030 Oakdale Community Center and Farm / City of Dreams. This community center is where Community Tech Network and <dev/Mission> organized digital literacy classes and router giveaways for residents at Hunters Point West.
Still, as CTN’s Griffiths notes, the largest obstacle for the success of her organization’s work more generally is the prohibitive cost of ongoing Internet access for low-income consumers; she says that the cost of the device is not as important but does represent another economic barrier. An April 2018 Pew Research report said that 20 percent of Internet users are “smartphone only” users in the home. Among households with income less than $30,000, 31 percent are “smartphone only” users, illustrating the challenges of affording home access on a limited income.39

“They’re not choosing, it’s being chosen for them, because they have no options but to go with just their cellular service, which then limits what they can do. Some websites are not responsive and the screens are too small,” Griffiths said.

By eliminating high-speed Internet subscription costs and offering devices and training, Monkeybrains and CTN are helping to give users more, and often better, options for Internet access.

In the event of a problem, residents receive the same customer support as any other Monkeybrains customer. From a financial perspective, this is the single costliest ongoing expense. When the building is properly wired, the costs to the ISP range from $60–$100 per unit in one-time expenses. The bandwidth cost per unit per month is less than $1 and other expenses are similarly low, except providing helpdesk support. And even there, if a local digital literacy effort can be a first line of help, Monkeybrains believes this model is sustainable at a cost of $10/month per unit—for a gigabit.

**Pulling It All Together**

Once a community decides universal broadband access is a priority and understands the basic economics around deploying broadband in different scenarios, the opportunities for closing the digital divide broaden immensely. Even in a large city, where bureaucratic silos and industry bottom lines can cloud community outreach, the case of San Francisco and Monkeybrains shows that a few committed stakeholders can make things happen for digital inclusion.

In American urban centers today, very few lack access to other basic infrastructure such as roads, running water, and electricity. The case should be no different for broadband Internet access.

Monkeybrains saw the decision to bring gig capability to each of the housing complexes’ units as a way to demonstrate their belief that broadband is an essential utility.

“This is the infrastructural part of ‘bridging the digital divide’ at the level of access—fiber, a solid radio backup, and top-grade carrier infrastructure right to the unit just as would be expected in a well-resourced luxury condo building,” Preston Rhea explained.

What makes this project stand out is not only how manageable both the upfront and operating costs are, but also that a few simple yet key decisions along the road in the renovation process did wonders for making this project sustainable for years to come.

Monkeybrains is helping the City of San Francisco harness its dark fiber assets to provide Internet connectivity to low income housing. The City has expertise in building fiber assets. Monkeybrains is able to interconnect that network to provide access on that fiber and support the individual users. The Department of Technology Office of Digital Equity through the CTN and others offer training and home routers to drive adoption. This combination offers a model for true digital equity.
Endnotes


6. See http://www.pewresearch.org/fact-tank/2018/03/05/some-americans-dont-use-the-internet-who-are-they/ and note that digital divide researchers believe some of those who say they are not interested in the Internet are embarrassed to say they cannot afford it.

7. https://www.monkeybrains.net


10. https://www.communitytechnetwork.org/about/

11. https://www.digitalinclusion.org/

12. To understand more about the dynamics of the FCC’s 25/3 broadband standard, read: https://muninetworks.org/content/why-25-Mbps-3-Mbps-reasonable-minimum-standard-2018


16. This is a result of a provision in the 2017 California Internet for All Now Act (AB 1665) which lowered the definition of “unserved household” from the already inadequate standard of 6 Mbps download / 1.5 Mbps upload to 6 Mbps download / 1 Mbps upload, almost certainly due to pressure from AT&T and other corporate lobbyists. This is significantly lower than the FCC’s definition of broadband (25 Mbps download / 3 Mbps upload) and effectively excludes urban areas from funding eligibility. AB 1665 text: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB1665. ILSR’s coverage of the bill: https://ilsr.org/california-lawmakers-vote-against-rural-constituents-for-high-quality-broadbandaccess/. Local coverage of the bill controversy: https://www.cvindependent.com/index.php/en-US/news/local-issues/item/4078-connected-at-a-cost-is-the-internet-for-all-now-act-a-lifeline-for-rural-communities-or-a-big-giveaway-to-the-telecomindustry.
From the final rule: “Installing unit-based broadband infrastructure in multifamily rental housing that is newly constructed or substantially rehabilitated with or supported by HUD funding will provide a platform for individuals and families residing in such housing to participate in the digital economy and increase their access to economic opportunities.”

There are plenty of people who deserve credit for this rapidly-expanding model but we wanted to note that it was the public safety team that took initiative in getting this started and proving the model before city leaders ultimately recognized the value and benefits.

Email from Mason Carroll Feb 27, 2019.

Cost information and background in this paragraph from an email from Paul Travis Jan 11, 2019.