San Francisco's Digital Deserts
How San Francisco Chinatown and other neighborhoods are left behind in the digital divide

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Glossary

- **Broadband/High-Speed Internet**: Internet plans that deliver at least 25 Mbps download speeds are considered high-speed by the FCC and are often referred to as "broadband."

- **Bandwidth**: The maximum amount of data that can be transmitted, typically measured as megabits per second (Mbps).

- **Speed**: How fast information can travel. Internet service providers (ISP) will advertise the maximum speed that their network can deliver, but they are not required to publish or guarantee actual speed. The actual speed is dependent on many factors, some of which are outside of the ISP's control, including the residence's hardware (router, etc.), the number of people in the building/neighborhood using the internet, and more. Factors that are generally within an ISP's control can include how they prioritize network resources and resolve network congestion.

- **Internet Service**: There are four main internet service delivery methods, which all represent the "last mile" connecting users' residences to internet networks.

  - **DSL (Digital Subscriber Line)**: DSL operates on local phone lines to connect to the internet and is the most widely available and cheapest option. It is by far the slowest option with the lowest bandwidth and slower download and upload speeds than other options. Generally, DSL does not reach broadband speeds and it often cannot support multiple devices at once.

  - **Cable**: Cable internet uses cable wires to provide high-speed internet and TV service, which can support multiple devices at once. Plans offer different tiers of speed at various price ranges. Cable speeds depend on the usage in your area and at peak times or in densely populated areas the speeds can lag. Because of historic monopoly pressures where one provider installs expensive cable infrastructure in an area and charges consumers to access it, there are typically only a few cable providers available in a particular area and many rural areas only have access to DSL.

  - **Fiber**: Fiber, or fiber-optic is the newest and fastest internet option, but it is also the most expensive and often least available. Like cable internet, fiber requires professional installation services to run a fiber-optic cable into a person's residence. Because it is a relatively recent technology and less available than cable, fiber is not considered a monopoly.

  - **Fixed Wireless**: Fixed wireless relies on radio waves transmitted by a cell tower to deliver internet signals to an exterior antenna. Since it does not require installation into a person's residence and offers high speeds, it is seen as an alternative to cable and fiber. However, fixed wireless internet requires a line of sight and can be impacted by poor weather conditions, making it less reliable than cable or fiber.

- **Internet Service Provider (ISP)**: A company that provides users with internet connection

- **San Francisco**: City and County of San Francisco

- **Wi-Fi**: Wireless technology that allows cell phones, computers, tablets, and other electronic devices to connect to the internet through radio waves using a router.

Acknowledgements

Executive Summary

Access to reliable, high-speed broadband internet is increasingly essential to employment, education, community, and sustainable local economies. Without consistent, fast, affordable internet, many individuals face barriers in working from home, attending classes, completing coursework, and accessing virtual healthcare appointments. Small businesses lose out on economic growth. Unfortunately, in San Francisco, the nation's technological powerhouse, this critical resource is not universally accessible – leaving low-income and limited-English proficient (LEP) communities of color largely cut off from the digital world.

Chinese for Affirmative Action (CAA) conducted research to better understand the scope and scale of digital inequities in Chinatown and other communities of color in San Francisco. We used multiple methodologies for our investigation: a review of federal, state, and local policies; interviews with government officials; interviews with dozens of community residents, leaders, and partners; case studies of internet access points; and quantitative analysis of internet prices and speeds for 105 randomly-selected residential and business addresses across all 11 supervisorial districts of San Francisco. Our findings were not surprising, but demonstrate the work San Francisco policymakers must make in order to close the digital divide:

Findings

Citywide:
- For AT&T, one of the largest internet service providers in San Francisco, addresses in high-poverty neighborhoods had far less access to plans with 100 Mbps or faster speeds compared to addresses in low-poverty neighborhoods. This means that the slower plans in high-poverty neighborhoods cost about the same as high-speed plans in low-poverty neighborhoods. Higher poverty neighborhoods get less for the same price.

Availability:
- Almost half of Chinatown households (44%) do not have an internet broadband subscription and for those who do, a common sentiment among residents and small businesses is that the internet is slow and unreliable in their community.
- High-speed internet service is not widely available. Of the nine broadband internet providers available in the community, only one offers high-speed cable (Comcast). Although two ISPs offer fiber, the coverage is sparse, if not non-existent.

Cost:
- Kai Ming Head Start's survey of 71 Chinatown parents found that 29 (40.8%) of families experience stress about their abilities to pay for internet service.
- North East Medical Services' predominantly low-income patients cannot afford monthly internet costs even with the $30 monthly Affordable Connectivity Program (ACP) credit. ACP is a short-term federal program to make internet service more affordable for low-income households.
- Higher speed plans are often priced with an introductory discount, where prices surge after one year. For Chinatown's low-income residents who rely on internet access for schooling, jobs, and healthcare, these are predatory practices.
- Our case study of internet plans available at two addresses, one in Chinatown and one in North Beach, shows that residents at the North Beach address are offered maximum internet speeds that are six times higher than the maximum speeds offered to residents at the Chinatown address for the same cost despite being only 0.4 miles, or five blocks, apart.

Speed and Reliability:

- Chinatown residents who do have internet access find it slow and unstable, making it difficult to use Zoom and other videoconference or streaming platforms. These low speeds are especially prevalent in single room occupancy residences (SROs) and increase the difficulty in working from home or attending virtual classes. For example, children have a hard time maintaining focus with pauses or glitches in their instruction.

- AT&T costs $60 a month in Chinatown for one CAA client. The high cost of the internet is a major barrier for families in Chinatown, where 33% live below the poverty line. Yet, despite the high price, residents complain that the internet is "very slow and spotty." A resident noted that it takes sometimes 30 minutes to send three photos.

- Slow internet means Chinatown businesses lose out on the ability to accept cashless payments, which would allow them to generate more revenue and grow their business. A Chinatown community leader that works with local businesses stated: "One of the reasons restaurants stick to cash is because credit card machines are so slow due to poor internet, causing businesses to lose profits."

- According to the federal Indicators of Broadband Need dataset, Chinatown's median recorded speeds in 2021 were 59 Mbps download and 10 Mbps upload, well below proposed recommended broadband speeds of 100 Mbps download and 25 Mbps upload from the Federal Communications Commission (FCC).

Accessibility:

- Signing up for internet service, including discounted internet plans for low-income households, is a challenge for LEP communities due to the lack of internet access, in-language support, and outreach.

- Recent statistics show that 47% of Chinatown households do not have a desktop or laptop computer.

- When residents and businesses run into issues or service disruptions, they do not receive timely and adequate technical support in-language. According to our conversations, AT&T and Comcast lack adequate customer and technical support in Cantonese, the primary language spoken by Chinatown residents.

- In Chinatown, internet service requests can take three months to fix.

- Internet service providers offer affordable internet packages, such as Comcast's Internet Essentials plan, but it is a tedious process and requires digital and English literacy to sign up. Research shows that government-mandated internet plans designed for low-income families, like Comcast's Internet Essentials plan, are too slow to be relied on.

Choice:

- There are only three high-speed cable and fiber internet options in Chinatown: Comcast, Sonic, and Wave. However, fiber is virtually non-existent, meaning residents only have one option for high-speed internet. This lack of choice fuels high prices for Chinatown's residents.

Policy Recommendations

The lack of quality, reliable, and affordable internet in Chinatown functions as an example of how policy decisions, lack of targeted investments, and societal neglect can lead to internet deserts, especially in communities of color and those without full language access. As a result of poor access to reliable internet, children fall behind on learning; families are unable to connect to online essential services, careers, and job opportunities; seniors stay isolated; businesses lose out on profits; and overall; communities miss out on economic mobility. We urge the city to:

1. **Expand San Francisco's Fiber to Housing Program and provide free high-speed fiber internet to all low-income neighborhoods through robust community collaboration.**

2. **Hold ISPs that service San Francisco residents accountable to providing low-cost, quality internet access by requiring all ISPs to:**
   a. Publish guaranteed minimum speeds.
   b. Provide price information, including price increases, time-limited discounts, and low-income plans in plain and accessible language.
   c. Provide customer and technical support in the top 10 most-spoken languages in the city, according to the latest Census data.

3. **Publish the Digital Equity Scorecard by July 1, 2024 and commit to annual data collection and reporting.**

Background

Despite San Francisco's position as the technology capital of the country, one in 10, or 11.3%, of San Francisco residents does not have access to high-speed internet at home, "and one in seven public-school families doesn't have a computer with internet connection."[1] This inequality is largely concentrated in marginalized communities with high levels of poverty and high populations of people of color. According to 2021 Census data, 30% of households earning less than $35,000 do not have an internet subscription or rely on dial up internet service.[2]

Business owners and low-income residents have become so frustrated with poor internet connection that they have given up on the internet altogether, isolating themselves from an increasingly globalized world.[3] Students are impacted as well, with almost three in 10, or 29% of San Francisco Unified School District (SFUSD) students living without internet access and 10,000 students requiring access to a device and WiFi in order to participate in remote learning.[4]

Digital equity is a significant economic justice issue in historically disinvested communities like San Francisco Chinatown. Recent statistics show that 47% of Chinatown households do not have a desktop or laptop computer and 44% do not have an internet broadband subscription.[5] This suggests that residents must rely on mobile phones or public Wi-Fi connections, both of which are less reliable and slower than broadband. We have heard from our Chinatown community members that internet bandwidth was not strong or stable enough to support childrens' virtual learning needs when they

1   Thomas, Gregory. "Can San Francisco Realize the Dream of Public Internet?" *San Francisco Chronicle*, 21 June 2023, www.sfchronicle.com/culture/article/Can-San-Francisco-realize-the-dream-of-public-15464760.php.

2   "2021 ACS 5-Year Estimates Detailed Tables: B28004, B28008." U.S. Census Bureau, data.census.gov/table?g=050XX00US-06075&d=ACS+5-Year+Estimates+Detailed+Tables&tid=ACSDT5Y2021.B28008.

3   Fernandes, Deepa. "Why Is S.F. Chinatown's Internet so Bad? 'It's Racism,' Says the Person Trying to Fix It." *San Francisco Chronicle*, 24 Feb. 2022, www.sfchronicle.com/sf/article/Why-is-S-F-Chinatown-s-internet-so-bad-16931039.php.

4   "Mayor London Breed Announces Partnership to Increase Free Internet Access to Support Distance Learning." Office of the Mayor of San Francisco, 3 Apr. 2020, sfmayor.org/article/mayor-london-breed-announces-partnership-increase-free-Internet-access-support-distance.

5   Authors' calculation using data from the "Microsoft Digital Equity Dashboard." Microsoft Power BI, "Microsoft Digital Equity Dashboard," July 2022, app.powerbi.com/view?r=eyJrIjoiM2JmM2QxZjEtYWEzZi00MDI5LThlZDMtODMzMjhkZTY2Y2Q2IiwidCI6ImMxMzZlZWMwLWZlOTItNDVlM-C1iZWFlLTQ2OTg0OTczZTIzMiIsImMiOjF9.

had to use Zoom or similar streaming platforms, making remote learning inaccessible. For Chinatown, a neighborhood that has been severely affected by the loss of tourism and foot traffic since the COVID-19 pandemic, the struggle to connect to the world beyond its borders has been acute. Out of the approximately 530 single resident occupancy (SRO) hotels in the city, many of which are located in Chinatown, only a handful have high-speed internet, cutting off its predominantly older occupants from the outside world.[6] Our staff reports that most low-income family clients living in SROs usually rely on their phone for the internet. Approximately one in five SRO residents is over 65,[7] making virtual medical appointments a necessary accommodation to relieve mobility issues and prevent infections from communicable diseases. District 3 Supervisor Aaron Peskin, whose district includes Chinatown, heard from the community that the lack of reliable internet impeded access to lifeline services, including ordering groceries and scheduling online doctor appointments.[8]

Chinatown's aging buildings make it difficult to upgrade its internet infrastructure. Many of the buildings are over 100 years old and it would be costly to wire them with fiber-optic cables. Advocates believe that telecom businesses and internet service providers (ISPs) are reluctant to bring fiber into dense, urban communities with old housing stock such as Chinatown due to these higher costs and low projected revenue because residents cannot afford more expensive fiber internet packages.[9] Overall, urban areas continue to struggle with digital divide issues, disproportionately impacting seniors, people with disabilities, people of color, and low-income communities.

These issues must be rapidly addressed as the internet is a "gateway" resource that enables social connectivity, public participation, survival, and citizenship. Lack of internet access contributes to poor public safety, medical and mental health, and socioeconomic outcomes.[10] As the internet has become increasingly ubiquitous, especially with the onset of the COVID-19 pandemic that shifted job opportunities and education online, accessible high-speed internet is critical in closing socioeconomic gaps.

6   Kodner, Sofie. "'It Makes a Humongous Difference': Lack of Wi-Fi in City SROs Deepens Residents' Isolation." *San Francisco Chronicle*, 26 Apr. 2022, www.sfchronicle.com/bayarea/article/It-makes-a-humongous-difference-Lack-of-16513973.php.
7   Comerford, Cynthia. "Single Room Occupancy Hotels in San Francisco. A Health Impact Assessment." San Francisco Department of Public Health Health Impact Assessment Program, 2016, www.pewtrusts.org/-/media/assets/external-sites/health-impact-project/sfdph-2016-sroh-report.pdf.
8   Fernandes 1.
9   Kodner 1.
10   Sanders, Cynthia and Edward Scanlon. "The Digital Divide Is a Human Rights Issue: Advancing Social Inclusion Through Social Work Advocacy." *Journal of Human Rights and Social Work,* vol. 6,, 2021, pp. 130-143. doi:10.1007/s41134-020-00147-9.

Methodology

In the summer of 2023, Chinese for Affirmative Action launched a research project to better understand the scope and scale of digital inequities in Chinatown in order to make informed recommendations for local and state policymakers. Our team reviewed federal, state, and local policy efforts to address this issue, spoke with state and local officials working on equitable broadband access, and connected with dozens of community residents and partners to gather evidence of the severity of the digital divide and how it impacts residents and businesses.

Internet Plan Maximum Speeds and Pricing

We modeled our research on methods and resources from the Digital Equity LA coalition and the California Community Foundation (CCF) Digital Equity Initiative, who produced a report on internet speed and pricing disparities in Los Angeles.[11]

Sample: We looked at 105 randomly selected residential and business addresses across all 11 supervisorial districts of San Francisco to compare internet plans across the three most widely available ISPs: AT&T, Comcast, and Verizon.[12]

Plan data: We collected data on the two most affordable plans.[13] For each plan, we collected data on price and speed. We collected introductory prices and prices after the initial rate but did not incorporate discounts that gave free months into the price or equipment fees. If the ISP provided a range instead of one number as the maximum speed, we used the midpoint of the range as the effective maximum speed.

11   Digital Equity LA. "Slower and More Expensive. Sounding the Alarm: Disparities in Advertised Pricing for Fast, Reliable Broadband." California Community Foundation, Oct. 2022, www.calfund.org/wp-content/uploads/Pricing-Disparities-Report.pdf.

12   McDermott, Catherine. "Best Internet Service Providers in San Francisco." *U.S. News & World Report*, 11 Sept. 2023, www.usnews.com/360-reviews/services/internet-providers/local/california/san-francisco.

13   If more than one plan had the same price, we collected data on the faster plan.

Neighborhood data: In our analysis, neighborhood is defined as a Census tract. We mapped each address to its Census tract and merged it with demographic data from the 2017-2021 American Community Survey Five-Year Estimates. We focused on the percent of households living in poverty and the percent of people aged 5 years and older who speak English less than very well (limited-English proficiency or LEP). We categorized each neighborhood based on whether the demographic statistic was above or below the San Francisco average. For example, neighborhoods with a poverty rate above the San Francisco average would be labeled as "high," or higher in poverty. Neighborhoods with a poverty rate below the San Francisco average would be labeled as "low," or lower in poverty.

We analyzed the data and looked at how many residential addresses were offered 100 Mbps speeds. The FCC has proposed a broadband speed benchmark of 100 Mbps of download speed and 20 Mbps of upload speed as the minimum standard for consistent internet connection for residential addresses as well as small businesses. Using this FCC proposed benchmark, we compared the residential homes and businesses that fall above and below the 100/20 Mbps speeds to the neighborhood demographics ("high" or "low" poverty and LEP). From here, we were able to determine which portions of the population had lower rates of sufficient broadband standards proposed by the FCC.

Case Studies

In addition to looking at speeds advertised by the ISPs, we developed case studies of access to affordable, high-speed internet in Chinatown and the neighboring Financial District and North Beach. In Case Study #1, we compared a randomly selected North Beach address to a randomly selected address in Chinatown to compare the differences in overall broadband availability and costs. In Case Study #2, we visited two restaurants, one in Chinatown and one in the neighboring Financial District. We used the Measurement Lab's Network Diagnostic Tool to measure internet upload and download speeds.[14] For each location, we took three measurements and compared the two businesses' average internet download and upload speeds.

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14   D'Auria, Roberto, Lai Yi Ohlsen, and Phillipa Gill. Measurement Lab, www.measurementlab.net.

Federal, State, and Local Policy Efforts to Bridge the Divide

Work is being done at federal, state, and local levels to close the digital divide and align minimum standards to everyday internet needs. These efforts go back to the early 2000s and have had varying levels of success. Understanding the governmental policies in place situates our research and helps guide our recommendations.

The FCC regulates and sets national standards for telecommunications. In 2015, the FCC set a minimum standard of 25 Mbps download speed and 3 Mbps upload speed. This speed allows one user per household to send emails, browse the internet, stream videos, and join video conferencing.[15] In 2022, the FCC reviewed the current digital landscape and post-COVID changes to household internet needs and proposed an increase in the national minimum for broadband speeds to 100 Mbps download and 25 Mbps upload speeds, which would allow multiple users in the household to participate in video conferencing and streaming at the same time.[16] The Notice of Inquiry additionally proposes to set a national goal of 1 Gbps/500 Mbps for the future. In her comments on the proposal, FCC Chairwoman Jessica Rosenworcel shared:

The needs of internet users long ago surpassed the FCC's 25/3 speed metric [25 Mbps download, 3 upload], especially during a global health pandemic. The 25/3 metric isn't just behind the times, it's a harmful one because it masks the extent to which low-income neighborhoods and rural communities are being left behind and left online. That's why we need to raise the standard for minimum broadband speeds now and while also aiming higher for the future, because we need to set big goals if we want everyone everywhere to have a fair shot at 21st century success.[17]

In addition to speed, the FCC is also in the process of developing regulations to prevent and eliminate digital discrimination, defined as "policies or practices, not justified by genuine issues of technical or economic feasibility, that differentially impact consumers' access to broadband internet access service based on their income level, race, ethnicity, color, religion, or national origin."[18]

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15   "Household Broadband Guide." Federal Communications Commission, 18 July 2022, www.fcc.gov/consumers/guides/household-broad-band-guide. Accessed 17 Nov. 2023.

16   "Chairwoman Rosenworcel Proposes to Increase Minimum Broadband Speeds and Set Gigabit Future Goal." Federal Communications Commission, 15 July 2022, docs.fcc.gov/public/attachments/DOC-385322A1.pdf.

17   "Chairwoman Rosenworcel Proposes to Increase Minimum Broadband Speeds," 1.

18   "FCC Extends Comment Cycle for Digital Discrimination NPRM." Federal Communications Commission, 17 Mar. 2023, www.fcc.gov/fcc-ex-tends-comment-cycle-digital-discrimination-nprm.

The California Public Utilities Commission (CPUC) regulates telecommunications providers in the state, which includes internet providers. However, the state does not have regulatory authority over broadband internet in the same way it regulates telephone, water, or energy utility companies, leaving a regulatory gap on the state's ability to set pricing and other controls on ISPs.[19] In 2006, California passed the Digital Infrastructure and Video Competition Act, which centralized CPUC's power to issue franchises to service providers for the state.[20] Section 5890(b)(1) of the legislation deems that cable operators "may not discriminate against or deny access to service to any group of potential residential subscribers because of the income of the residents in the local area in which the group resides."[21] California Assemblymember Chris Holden introduced Assembly Bill 41 (AB 41), The Digital Equity in Video Franchising Act of 2023, in an attempt to build stronger equity requirements and "leverage the state's licensing authority over cable companies, who are among the largest internet service providers in the state, by obligating them to serve the public under the highest standards and in a manner that ensures equal access to service."[22] AB 41 was ultimately vetoed by the governor.[23]

The California Department of Technology's Office of Broadband and Digital Literacy has played a key role in the current state of broadband access in California. The Office of Broadband and Digital Literacy supports the California Broadband Council (CBC), which was established by the California Legislature in 2010 to expand broadband to underserved communities within California.[24] The CBC published the "Broadband Action Plan 2020: California Broadband for All," a report that outlines solutions to combat internet access inequities in California.[25] The Office of Broadband and Digital Literacy also runs the Middle-Mile Broadband Initiative, a $3 billion effort launched in 2021 to create and install a 10,000-mile physical fiber-optic infrastructure to "bring internet connectivity to homes, businesses and community institutions."[26] The legislation that authorized this program requires that unserved communities are prioritized in the initial phase of the middle-mile network, which will span 8,300-miles.[27] An additional $2 billion is allocated for Last-Mile Infrastructure Projects to facilitate broadband connection to unserved communities. CPUC is accepting Federal Funding Account Applications, or grant applications for federal funds, for infrastructure projects that provide end-user service to existing unserved communities and expects to distribute funds in 2024.[28]

In 2021, SB 156 signed by Governor Gavin Newsom set the goal for all Californians to have at least 100 Mbps download and 20 Mbps upload.[29] CPUC's California Advanced Services Fund (CASF) distributes

19   Wu, Titus. "California Bill Makes Push to Regulate Broadband as Public Utility," *Bloomberg Law*, 10 Mar. 2023. news.bloomberglaw.com/tech-and-telecom-law/california-bill-makes-push-to-regulate-broadband-as-public-utility. Accessed 16 Nov. 2023.
20   "Video Franchising," California Public Utilities Commission, www.cpuc.ca.gov/regulatory-services/licensing/video-franchising.
21   "California Public Utilities Code § 5890." *California Legislative Information*, 1 Jan. 2008, leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=5890.&lawCode=PUC.
22   Mkhlian, Stephanie. "Assemblymember Holden Introduces Bill to Bridge the Digital Divide." Office of Assemblymember Chris Holden, 5 Dec. 2022, a41.asmdc.org/press-releases/20221205-assemblymember-holden-introduces-bill-bridge-digital-divide.
23   Holden, Chris. "AB-41 Telecommunications: The Digital Equity in Video Franchising Act of 2023." *California Legislative Information*, 2023-2024, leginfo.legislature.ca.gov/faces/billStatusClient.xhtml?bill_id=202320240AB41.
24   California Broadband Council. broadbandcouncil.ca.gov/.
25   Broadband Action Plan 2020, Dec. 2020. broadbandcouncil.ca.gov/wp-content/uploads/sites/68/2020/11/BB4All-Action-Plan-DRAFT-v15.pdf.
26   Middle-Mile Broadband Initiative, State of California, middle-mile-broadband-initiative.cdt.ca.gov/.
27   Committee on Budget and Fiscal Review. "SB-156 Communications: broadband." *California Legislative Information*, 2021-2022, leginfo.legislature.ca.gov/faces/billStatusClient.xhtml?bill_id=202120220SB156.
28   Last Mile Federal Funding Account, California Public Utilities Commision. https://www.cpuc.ca.gov/industries-and-topics/internet-and-phone/broadband-implementation-for-california/last-mile-federal-funding-account
29   State of California, Senate. "Senate Bill No. 156 Communications Broadband." *California Legislative Information*, 20 July 2021, leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB156.

grants to public entities and community-based organizations to complete projects related to digital literacy, broadband access, and network-building. CASF provides grants to eligible entities to subsidize the cost of middle and last mile infrastructure to locations unserved by broadband speeds.[30]

Locally, there are also efforts to advance broadband accessibility across San Francisco. San Francisco's Department of Technology and the Mayor's Office of Housing and Community Development (MOHCD) has implemented a Fiber to Housing Program.[31] The Fiber to Housing program delivers free internet to residents in affordable housing through a partnership with Monkeybrains, a local ISP. As of 2022, the Fiber to Housing Program has provided internet to over 5,000 households spanning 36 low-income housing communities.[32] The city's Digital Equity Program also promotes and helps residents sign up for the FCC's Affordable Connectivity Program (ACP), which provides funds to ISPs to pass along as $30 monthly statement credits to eligible households that can be applied towards home internet.[33] Currently, 2,317,780 households in California are enrolled in the ACP.[34] ACP funds represent a short-term solution to larger internet access issues; it is anticipated that these funds will run out by mid 2024 and it is unclear whether Congress will renew financial assistance to families.[35] In addition, ACP's sign-up process is cumbersome and requires a multi-step process where households apply for the program and then work with a participating ISP to apply for the subsidy. This online process makes it difficult for those without internet service and those who are LEP.[36]

San Francisco's Digital Equity Strategic Plan for 2019-2024 acknowledges that: "San Francisco's digital divide still persists today. About *one in eight residents still lack high-speed home internet service*, one in seven families in public school lack a computer connected to the internet at home . . . In particular, many who are *low-income, limited English proficient, senior, and/or have a disability* struggle to have reliable high-quality service . . . Internet access and digital literacy are *essential infrastructure for the 21st century*. As more education, workforce, health care, and City services move online, *digital inequities threaten to worsen existing inequities in all areas* [emphasis added]."[37]

San Francisco recognizes both the disparity and divide and that those who come from historically marginalized groups are those most affected. It also acknowledges that affordability is the "most commonly cited challenge for the less connected."[38] San Francisco outlines efforts to bridge the divide, including providing #SFWiFi across various locations, providing free Wi-Fi and computer access at SF public libraries, and outfitting SFUSD public schools with modern technology.[39] However, the city can do much more to provide free high-speed internet connection to homes in low-income neighborhoods.

30   "CASF Broadband Infrastructure Grant Account." California Public Utilities Commission, www.cpuc.ca.gov/industries-and-topics/internet-and-phone/california-advanced-services-fund/casf-infrastructure-grant. Accessed 4 Oct. 2023.

31   "Fiber to Housing Program." SF.gov, sf.gov/fiber-housing-program.

32   Information and Communication Technology Plan FY 2022-26, City and County of San Francisco, page 49. sf.gov/sites/default/files/2021-03/ITC_2022-26_Plan_0421_V2_Web%20%281%29.pdf.

33   ACP Connectivity Program,getacp.org.

34   State of California. "Affordable Connectivity Program enrollment tracker." California Department of Technology Broadband for All, 26 July 2023, broadbandforall.cdt.ca.gov/affordable-connectivity-program/acp-enrollment/.

35   Harjai, Kavish. "Broadband Subsidy Program That Millions Use Will Expire Next Year if Congress Doesn't Act." *Associated Press,* 26 Aug. 2023, apnews.com/article/broadband-federal-subsidy-internet-access-congress-biden-f196179935b45632d45169698fd31672.

36   Hayes, Joseph, Niu Gao, Darriya Starr, and Amy Gong Liu. "Achieving Universal Broadband in California." Public Policy Institute of California, March 2023, www.ppic.org/publication/achieving-universal-broadband-in-california.

37   "Digital Equity Strategic Plan 2019-2024, City and County of San Francisco." sfmohcd.org/sites/default/files/SF_Digital_Equity_Strategic_Plan_2019.pdf.

38   "Digital Equity Strategic Plan 2019-2024," 14.

39   "Digital Equity Strategic Plan 2019-2024," 9.

The City's Digital Equity Strategic Plan also promised to develop a Digital Equity Scorecard and publish annual reports and has yet to do either.[40] When reached for comment, MOHCD stated that the COVID-19 pandemic "significantly changed the digital landscape . . . This means that our approach to digital equity must also evolve to address these changes and continue meeting the needs of our diverse community."[41] While no scorecards or reports have been published, Rey LaChaux, the digital equity manager for MOHCD, said the office has shifted its focus to the creation of a Digital Equity Advisory Committee which will "play an integral role in informing the next iteration of our Digital Equity Strategic Plan and Scorecard."[42]

In Chinatown, Supervisor Peskin allocated $200,000 to the San Francisco Department of Technology to "outfit free high-speed internet at SRO buildings assessed to have a high number of seniors and school-age children and youth who have become reliant on the internet to participate in distance learning or access social services during the pandemic."[43] According to Supervisor Peskin's office, despite designating roughly 12 SROs in Chinatown that were eligible for this upgrade, they were only able to outfit five buildings through this project. Supervisor Peskin's office reported that building managers' distrust was the main hurdle to installation.

Overall, it is clear that government agencies at all levels have engaged in efforts to address the digital divide, yet low-income communities continue to fall behind. The government's work must strive to be more efficient and effective, given the urgency of addressing this issue and impacts of the digital divide on marginalized communities.

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40   "Digital Equity Strategic Plan 2019-2024," 30.
41   LaChaux, Rey. Email Interview. 17 July 2023.
42   LaChaux, 1.
43   "Pilot Program to Bridge Internet Access Gap for Chinatown SRO's." San Francisco Board of Supervisors, 13 Oct. 2021, sfbos.org/sites/default/files/Chinatown%20SRO%20WiFi%20Press%20Release.pdf.

Digital Redlining in San Francisco

Access and Service Quality

Chinatown community members, small business owners, and local nonprofit organizations have voiced their concerns over the expensive, low-quality internet in the neighborhood. Kai Ming Head Start, an organization that offers affordable preschool for Chinatown community members, conducted a parent study of 71 families and found that 29 (40.8%) of the families experience stress in their abilities to afford to pay for internet.[44] Most CAA clients, who tend to be low-income families living in SROs, rely on their cell phones for internet or the hotspots that their children brought home when they transitioned to remote learning during the pandemic. For CAA clients who do have internet access, their bandwidth is low speed and unstable, and they have difficulties using Zoom and similar streaming platforms. These low speeds are especially prevalent in SROs and increase the difficulty in working from home or attending virtual classes. As a result, children have a hard time maintaining focus with pauses or glitches in their instruction. For one resident, AT&T cost $60 a month in Chinatown and the internet was "very slow and spotty."[45] Another resident concurred, stating that it took 30 minutes to send three photos. For another resident, they kept incurring expensive fees with AT&T and had to switch to Comcast, which is seen as better than AT&T, but still "quite slow."[46]

Jennifer Chan, youth leadership and empowerment program manager at Chinatown Community Development Center (CCDC), has worked on digital equity in Chinatown for over a decade and shared recent challenges CCDC faced when addressing this issue.[47] During the pandemic, many low-income families struggled to pay for high-speed internet, especially families with multiple school-age children with remote learning needs. In 2021, CCDC worked with the city to outfit two SRO buildings with internet, but landlords were hesitant to take on these new costs given the history of inconsistent internet connectivity and distrust of government intervention. Chan estimates it would take a few hundred thousand dollars to retrofit an older building in the neighborhood and wire it for high-speed internet. CCDC worked with the city to provide grants to pay for hotspot devices and free Wi-Fi, but the internet bandwidth available to low-income households was insufficient for remote learning. Research shows that government-mandated internet plans designed for low-income families, like Comcast's Internet Essentials plan, are too slow to be relied on.[48] As a result, residents would have to pay for more expensive internet plans to access sufficient speeds, plans that are out of reach for larger, low-income families. Even with higher speed plans, Chan notes that these are often predatory packages that only allow a one-year deal, after which prices spike.[49]

44 Yang, Jerry. Email Interview. 31 July 31 2023.
45 Van, Crystal. Email Interview. 17 July 2023.
46 Lo, Lily. Interview. 19 July 2023.
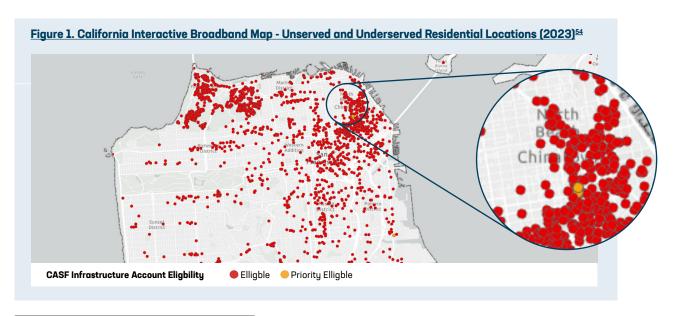47 Chan, Jennifer. Interview. 9 Aug. 2023.
48 Le, Vinhcent. "On the Wrong Side of the Digital Divide." Greenlining Institute, 2 June 2020. greenlining.org/publications/on-the-wrong-side-of-the-digital-divide/.
49 Chan, 1.

"Chinatown is underserved [when it comes to internet access.] When you talk about internet for small businesses, some really do not have it. SROs as well," says Lily Lo, community leader and founder of BeChinatown, a nonprofit organization preserving the history and culture of Chinatown.[50] Poor internet access impacts businesses in Chinatown, with merchants losing out on revenue-generating opportunities to accept cashless payments, manage websites and e-commerce, participate in online deliveries, and run digital advertising. There are approximately 990 businesses in Chinatown[51] and many of them are cash-based. "One of the reasons restaurants stick to cash is because credit card machines are so slow due to poor internet, causing businesses to lose profits," says Lily Lo. In addition, Lo says, when there are power outages during business hours, businesses are unable to rely on computers or other devices to take payments.

Availability

Almost half of Chinatown households (44%) do not have an internet broadband subscription[52] and for those who do, the common sentiment among residents and small businesses is that the internet is slow and unreliable. High-speed internet service is not widely available: of the nine broadband internet providers available in the community, only one (Comcast) offers high-speed cable and fiber internet in Chinatown, and fiber (the fastest, most technologically advanced internet option) is sparse, if not non-existent.[53] Figure 1 shows the number of residential locations unserved by at or greater than the FCC's broadband speed benchmark of 25/3 Mbps (orange) or less than 10/1 Mbps (red) that are eligible for CASF grants. The map documents the high concentration of unserved locations in the city, including the majority of Chinatown.
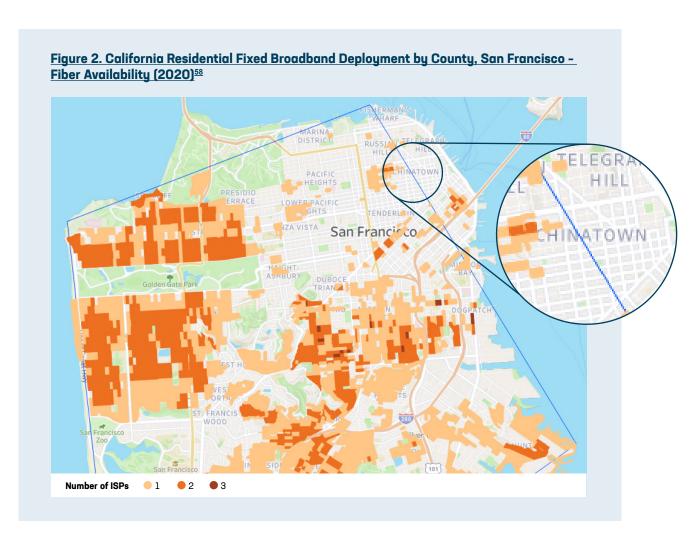
Figure 1. California Interactive Broadband Map - Unserved and Underserved Residential Locations (2023)[54]

CASF Infrastructure Account Eligbility   ● Elligble ● Priority Elligble

50 Lo, 1.

51 "Registered Business Locations - San Francisco." DataSF, 18 Sept 2023, data.sfgov.org/Economy-and-Community/Registered-Business-Locations-San-Francisco/g8m3-pdis.

52 Authors' calculation using data from the "Microsoft Digital Equity Dashboard." Microsoft Power BI, "Microsoft Digital Equity Dashboard," July 2022, app.powerbi.com/view?r=eyJrIjoiM2JmM2QxZjEtYWEzZi00MDI5LThlZDMtODMzMjhkZTY2Y2Q2IiwidCl6ImMxMzZlZWMwLWZlOTItNDVlM-C1iZWFlLTQ2OTg0OTTczZTIzMilsImMiOjF9.

53 Chinatown is considered 'Not Served' and Comcast is the only cable provider. "FCC National Broadband Map." Federal Communications Commission, 7 Nov. 2023, broadbandmap.fcc.gov/location-summary/fixed?version=dec2022&location_id=1059057607&addr1=1411+STOCK-TON+ST&addr2=SAN+FRANCISCO%2C+CA+94133&zoom=15.67&vlon=-122.409472&vlat=37.798606&br=r&speed=100_20&tech=3, Accessed November 14, 2023.

54 "California Interactive Broadband Map." California Public Utilities Commission, www.broadbandmap.ca.gov/.

The four most widely available internet service providers in the area are AT&T, Comcast, Verizon, and Sonic, and in our conversations with Chinatown community members, AT&T and Comcast were the two most commonly cited providers. Figure 2 (below) shows the availability of fiber internet in the city (49%); the map highlights the absence of fiber internet options in Chinatown and other historically redlined communities.[55] This map emphasizes the present day impacts of historical redlining, a racist federal government practice that designated parts of cities where Black and other communities of color lived as undesirable for home loans and other federal wealth-building investments.[56] Digital equity advocates have coined the term "digital redlining" to highlight how this historical injustice is manifested through residents' poor access to the internet.[57]
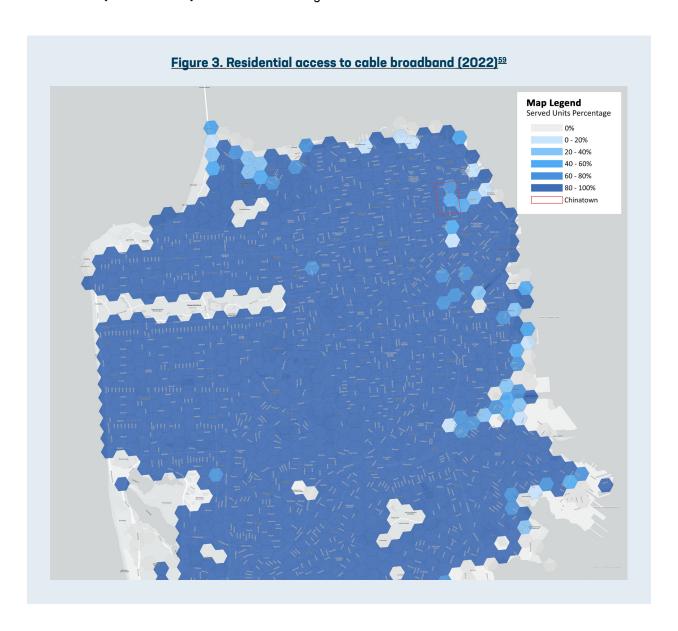
Figure 2. California Residential Fixed Broadband Deployment by County, San Francisco – Fiber Availability (2020)[58]

Number of ISPs ● 1 ● 2 ● 3

55 "EOY2020 CA Residential Fixed BB Deployment." California Public Utilities Commission. 2020, public.tableau.com/app/profile/cpuc/viz/EOY-2020CAResidentialFixedBBDeployment/Dashboard.

56 Gross, Terry. "A 'Forgotten History' Of How The U.S. Government Segregated America." NPR, 3 May 2017, www.npr.org/2017/05/03/526655831/a-forgotten-history-of-how-the-u-s-government-segregated-america; Sawyer, Nuala. "A History of Redlining in San Francisco Neighborhoods." Hoodline, 3 June 2014, hoodline.com/2014/06/a-history-of-redlining-in-san-francisco-neighborhoods/, Accessed November 14, 2023.

57 Tibken, Shara. "The Broadband Gap's Dirty Secret: Redlining Still Exists in Digital Form." *CNET*, 28 June 2021, www.cnet.com/home/internet/features/the-broadband-gaps-dirty-secret-redlining-still-exists-in-digital-form/.

58 "EOY2020 CA Residential Fixed BB Deployment." California Public Utilities Commission, 2020.
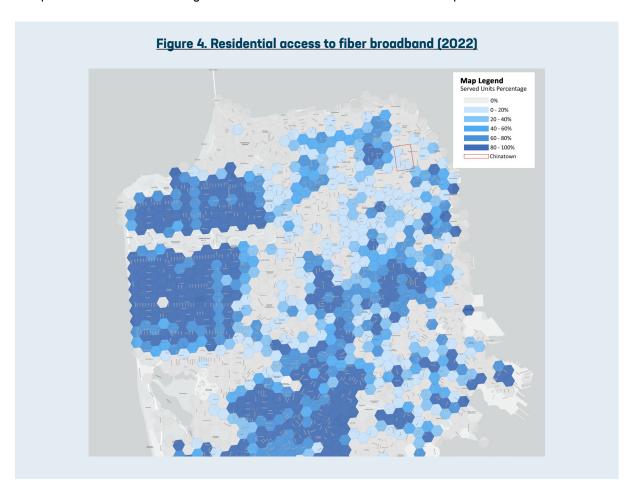
The following figures created from FCC's National Broadband Map spotlight Chinatown's dual disparity of being one of the few areas in San Francisco that is relatively underserved by cable and where fiber is virtually nonexistent compared to the rest of the city. Figure 3 documents residential access to cable broadband. While the majority of the city's residents are served by cable at rates of 80% or higher, Chinatown (outlined in red) is one of the few neighborhoods where 40% or fewer of residents are served.

Figure 3. Residential access to cable broadband (2022)[59]

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59   Note: Percent of residential units with ISP-reported availability of [cable/fiber] internet with 25 Mbps download, 3 Mpbs upload speeds or greater. Source data: Federal Communications Commission, Map: © Mapbox and © OpenStreetMap. "FCC National Broadband Map." Nov. 2023. broadbandmap.fcc.gov/home?version=dec2022.

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Figure 4 shows fiber availability in San Francisco, where 20% or fewer of Chinatown residents are served by fiber. Given these stark inequities spotlighted by FCC's National Broadband Map, it's important to note that advocates, states, and local governments have raised concerns that the National Broadband Map overstates areas that are served by broadband and over relies on ISP self-reported data.[60] The overstating of broadband access is particularly a concern for residents living in public and multi-family housing.[61] This suggests that the digital divide in neighborhoods like Chinatown compared to the rest of the city are much more severe than what FCC's maps are able to show.

Figure 4. Residential access to fiber broadband (2022)

Internet Pricing and Speed Findings

We conducted a study of 75 residential addresses and 30 business addresses in San Francisco to determine how many of these addresses have internet options that are at or above the FCC recommendation of 100 Mbps speeds and how much these plans cost. We analyzed this data by poverty rate. We looked at plans offered by AT&T (DSL and fiber), Comcast (cable and fiber), and Verizon (fixed wireless), the three largest internet service providers in Chinatown.[62]

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60 Liu, Chao. "The FCC Broadband Maps: Meet the New Maps, Same as the Old Maps." Electronic Frontier Foundation, 31 Jan. 2023, www.eff.org/deeplinks/2023/01/fcc-broadband-map-has-problems.
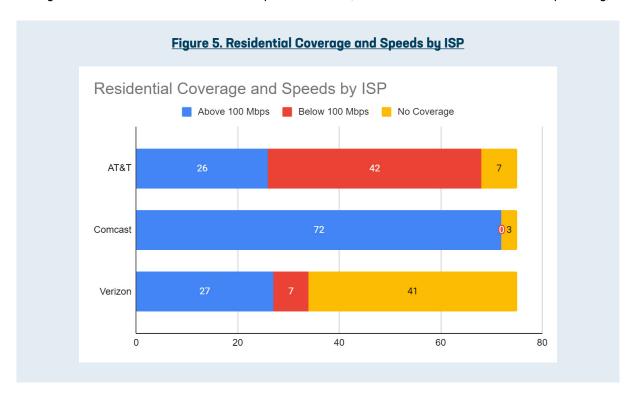
61 Liu

62 "TV and Internet Providers in Chinatown-San Francisco, San Francisco, CA." *Best Neighborhood*, bestneighborhood.org/tv-and-internet-chinatown-san-francisco-san-francisco-ca/.

It is important to note that the speed advertised for each internet plan was stated to be a maximum, and not a minimum or guaranteed speed. So while our analysis focuses on the availability of plans offering speeds up to 100 Mbps or more, it is unclear if residents are actually receiving speeds at 100 Mbps or more. Since there is no minimum mentioned, it is highly likely that residents are receiving speeds significantly lower than 100 Mbps, which also aligns with our conversations with community stakeholders and recorded speed tests. The National Telecommunications and Information Administration (NTIA) Indicators of Broadband Need dataset showed that median recorded speeds in Chinatown in 2021 were 59 Mbps upload and 10 Mbps download, well below the FCC's recommended speeds.[63] Case Study #1 delves into this issue further.

Residential Coverage of Advertised Plans that Offer Speeds at 100 Mbps or More

Our analysis highlights disparities in the availability of internet options, prices advertised, and maximum speeds offered across residential addresses. Comcast offered plans at the most number of addresses and offered speeds at 100 Mbps or more at the most number of addresses compared to the other ISPs in our study. Comcast delivered coverage at 72 of the 75 residential addresses evaluated. Verizon has the lowest coverage of the ISPs studied. Of the 75 residential addresses studied, only 34 addresses received Verizon coverage. Of those addresses, a majority had plans that offered speeds at 100 Mbps or more (nearly 80% of addresses served were offered speeds at 100 Mbps or more). AT&T advertised plans at double the number of addresses compared to Verizon (68 addresses as opposed to Verizon's 34 addresses), but it had the lowest number of plans that offered speeds at 100 Mbps or more (roughly 38%). In fact, despite the proportions being different, AT&T and Verizon actually covered nearly the same number of "above 100 Mbps" addresses (26 addresses vs 27 addresses, respectively).
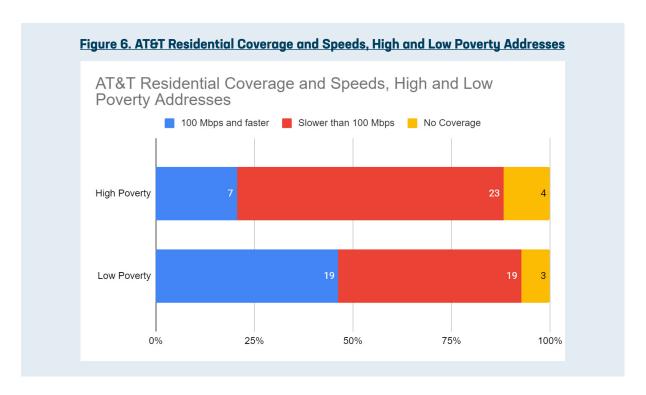
Figure 5. Residential Coverage and Speeds by ISP

Residential Coverage and Speeds by ISP

Legend: ■ Above 100 Mbps ■ Below 100 Mbps ■ No Coverage

ISP	Above 100 Mbps	Below 100 Mbps	No Coverage
AT&T	26	42	7
Comcast	72	0	3
Verizon	27	7	41

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63   "NTIA Creates First Interactive Map to Help Public See the Digital Divide Across the Country." U.S. Department of Commerce, June 2021, www.commerce.gov/news/press-releases/2021/06/ntia-creates-first-interactive-map-help-public-see-digital-divide.

Residential Plans Across High and Low Poverty Neighborhoods

We examined whether plan availability and pricing were related to poverty rate.

As demonstrated by the graphs below, for AT&T plans, high-poverty addresses had far less coverage at or above speeds of 100 Mbps, and had higher rates of coverage that fell below speeds of 100 Mbps. On the other hand, low-poverty addresses had rates that were about equal above and below 100 Mbps speeds. This suggests that for AT&T plans, low-poverty addresses are more likely to receive plans with speeds at 100 Mbps or above.

Figure 6. AT&T Residential Coverage and Speeds, High and Low Poverty Addresses
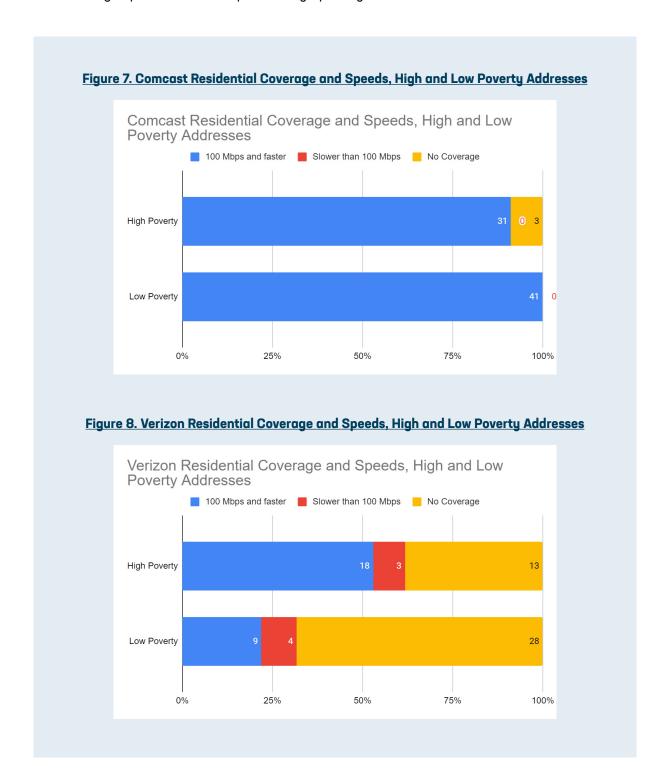
In addition, in Table 1 we calculated the average prices of AT&T plans by speed and poverty rate. Across all AT&T plans regardless of speed, high-poverty addresses pay an average of $55.70 per month, compared to an average of $55.96 per month for low-poverty addresses. This means for AT&T, the slower plans in high-poverty neighborhoods cost about the same as high-speed plans in low-poverty neighborhoods. Higher-poverty neighborhoods get less for the same price.

Table 1. AT&T Residential Average Prices, High and Low Poverty Addresses

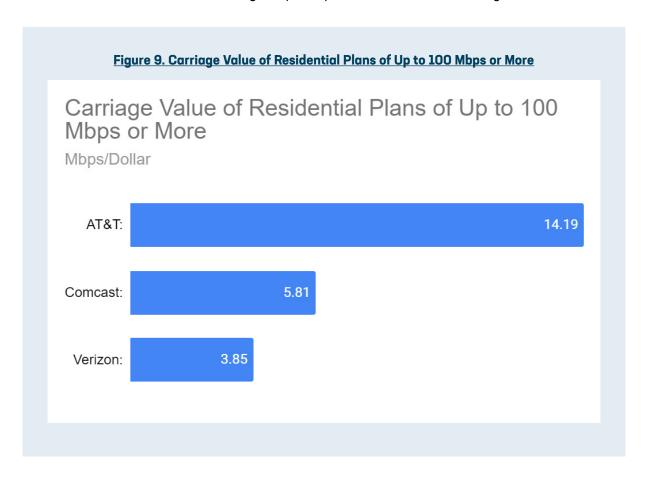|	Average price of 100 Mbps plan	Average price of 100 Mbps plan or lowest priced plan	Average of lowest priced plan	Average across plans
High Poverty	$56.43	$55.33	$55.33	$55.70
Low Poverty	$55.00	$56.45	$56.45	$55.96

For Comcast plans, high-poverty addresses had slightly less coverage at or above speeds of 100 Mbps compared to low-poverty addresses. For Verizon plans, high-poverty addresses had double the coverage of plans at 100 Mbps or faster than low-poverty addresses, about the same number of plans offered at speeds slower than 100 Mbps, and more than half the number of no coverage plans compared to low-poverty plans. This suggests that for Verizon plans, low-poverty plans have less access to high-speed internet compared to high-poverty addresses.

Figure 7. Comcast Residential Coverage and Speeds, High and Low Poverty Addresses

Comcast Residential Coverage and Speeds, High and Low Poverty Addresses

■ 100 Mbps and faster   ■ Slower than 100 Mbps   ■ No Coverage

High Poverty: 31 | 0 | 3
Low Poverty: 41 | 0

0%   25%   50%   75%   100%

Figure 8. Verizon Residential Coverage and Speeds, High and Low Poverty Addresses

Verizon Residential Coverage and Speeds, High and Low Poverty Addresses

■ 100 Mbps and faster   ■ Slower than 100 Mbps   ■ No Coverage

High Poverty: 18 | 3 | 13
Low Poverty: 9 | 4 | 28

0%   25%   50%   75%   100%

Pricing of Advertised Residential Plans that Offer Speeds at 100 Mbps or More

It is useful to also examine the pricing of these plans that meet the 100 Mbps speed marker. To do so, we calculated the carriage values of each internet plan that offered speeds of 100 Mbps or more for each address to determine the average Mbps offered for every dollar spent. A higher carriage value means a consumer is able to access higher speeds per dollar than a lower carriage value.

Figure 9. Carriage Value of Residential Plans of Up to 100 Mbps or More

Carriage Value of Residential Plans of Up to 100 Mbps or More
Mbps/Dollar

Provider	Value
AT&T:	14.19
Comcast:	5.81
Verizon:	3.85

Our analysis reveals that AT&T plans provide more than double the Mbps per dollar to customers than Comcast and Verizon plans. Our research documented AT&T plans that offered speeds up to 1,000 Mbps for $55 per month. To compare, Comcast offers a plan for speeds up to 400 Mbps for $50 per month. Finally, Verizon offers a speed range of 85-300 Mbps for $50 per month.

While it is clear that AT&T plans offer the highest carriage value, it is important to remember that AT&T only offered plans at or over 100 Mbps at 26 addresses, while Comcast had plans at or over 100 Mbps at more than double, or 72, addresses. In addition, Comcast offered the lowest price plan, with speeds up to 200 Mbps for $35 per month, at 28 addresses, whereas $55 was the lowest price for all AT&T plans we studied. Given that cost is cited as a primary barrier for internet access for Chinatown's residents, the $35 per month plan may be the only option affordable to residents.

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Man Kee
Seafood Hot Pot (2nd Floor)

Case Study #1: Residential Plans in North Beach v. Chinatown

We compared a randomly selected North Beach address to an address in Chinatown to compare the differences in overall broadband availability. 538 Vallejo St., a residential address in the North Beach neighborhood is about five blocks, or 0.4 miles, from 120 Trenton St., a residential address in Chinatown. Despite their close proximity, residents at the North Beach address are offered speeds between 85-300 Mbps from Verizon, while the residents at the Chinatown address are only offered 25-50 Mbps at the same price from the same provider. Our analysis shows that residents at the North Beach address are potentially able to access maximum internet speeds that are six times higher than the maximum speeds offered to residents at the Chinatown address for the same cost. It is worth noting that North Beach is a historically whiter neighborhood, with 35.6% of the population identifying as White and 53% identifying as Asian, whereas, in Chinatown, 3.4% identify as White and 96.4% identify as Asian.[64] This case study demonstrates the digital divide and failure of ISPs to provide equitable internet speeds to residents living in close proximity to each other.

Figure 10. Screenshot of Verizon plan offered at Chinatown address (120 Trenton St., San Francisco, CA 94133) and at North Beach address (538 Vallejo St., San Francisco, CA 94133)
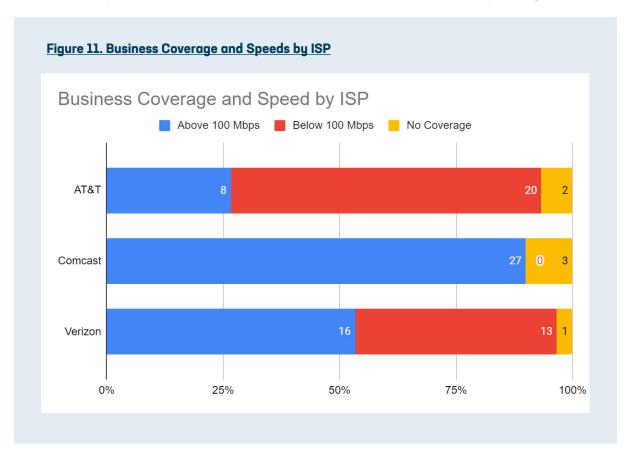

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64 Demographic Characteristics between Census Tracts 106, California and 107.01, California from the American Community Survey 5-Year Estimates. U.S. Census Bureau. "Custom Industries - Census Tract 107.01, California." U.S. Census Bureau. Census Business Builder, Dec. 2022, cbb.census.gov/cbb/#view=report&industries=00&clusterName=Custom+Industries&geoType=tract&theme=default&geoId=06075010701. Accessed 17 Nov. 2023; U.S. Census Bureau. "Custom Industries - Census Tract 106, California." Census Business Builder, Dec 2022, cbb.census.gov/cbb/#view=report&industries=00&clusterName=Custom+Industries&geoType=tract&theme=default&geoId=06075010600. Accessed 17 Nov. 2023.

Business Coverage

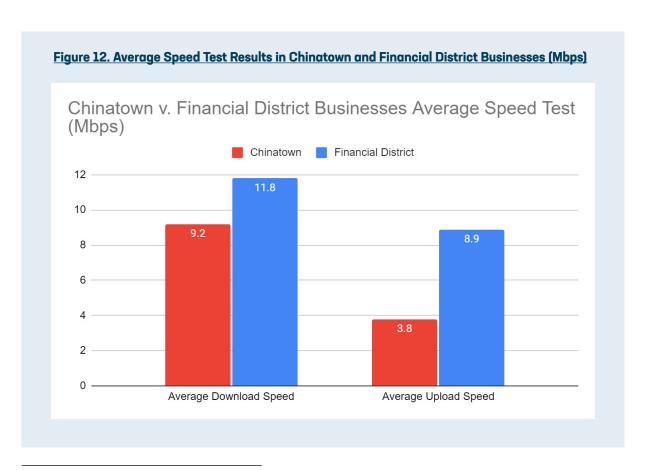**Business Coverage of Advertised Plans that Offer Speeds at 100 Mbps or More**

Comcast offered business speeds at 100 Mbps or more at the most number of addresses compared to the other ISPs in our study. Comcast delivered coverage to 27 of the 30 business addresses evaluated, while AT&T and Verizon offered plans at 28 and 29 addresses, respectively. All of the business addresses that Comcast had coverage for were offered speeds at 100 Mbps or more, and AT&T and Verizon offered plans at 100 Mbps or more for 27% and 53% of the addresses, respectively.

Figure 11. Business Coverage and Speeds by ISP

Business Coverage and Speed by ISP

Legend: Above 100 Mbps | Below 100 Mbps | No Coverage

- AT&T: 8 | 20 | 2
- Comcast: 27 | 0 | 3
- Verizon: 16 | 13 | 1

Case Study #2: Business Plans in Chinatown v. Financial District

Anecdotal evidence in Chinatown suggests that residents do not benefit from the high speeds advertised in their plans. CAA sought to research internet access and speed in Chinatown, though a significant limitation of research that looks at advertised speeds is that it is difficult to determine whether or not the subscriber actually experiences these speeds. ISPs are not required to publish the actual speeds that appear on-site. To add nuance to this issue, we visited two restaurants, one in Chinatown and one in the neighboring Financial District, and conducted multiple speed tests in person

to determine internet download and upload speeds. We used the average of the speed test results to compare the two businesses' average speeds. We found that although the businesses were only 0.4 miles, or a 9-minute walk, away from each other, there was a disparity in both the download speed, upload speed, as well as ISP availability. Using the Measurement Lab test,[65] we recorded the average download speed for the Chinatown restaurant as 9.18 Mbps and the average upload speed as 3.77 Mbps. According to our conversation with staff, this restaurant has an AT&T plan of $110 per month. Just a 9-minute walk away, the average download speed for the Financial District restaurant was 11.8 Mbps and its average upload speed was 8.90 Mbps. This restaurant had a Google Fiber plan and staff were unable to provide the plan's monthly cost. According to their website, Google Fiber offers 1 GB plans for $100 per month for business customers.[66] The difference in download speeds of the two businesses is 2.62 Mbps, which seems small but could limit a business' ability to stream music, access emails, download files, stream videos, and make video and teleconferencing calls.[67] Google Fiber is not available at the Chinatown restaurant's address, so even if the owners wanted to upgrade to Google Fiber, they would not have that option. This case study supports the conclusion that the Financial District has greater accessibility to faster and more affordable internet speed than in Chinatown, where internet is expensive and often lags.

Figure 12. Average Speed Test Results in Chinatown and Financial District Businesses (Mbps)

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65   D'Auria, Roberto; Ohlsen, Lai Yi; and Gill, Phillipa. Measurement Lab, www.measurementlab.net/.
66   Mosher, Bill. "Your Business – now even faster." Google Fiber Business, 8 Mar. 2022, fiber.google.com/blog/2022/03/your-business-now-even-faster.html, Accessed 17 Nov. 2023.
67   "Broadband Speed Guide." Federal Communications Commission, 18 July 2022, https://www.fcc.gov/consumers/guides/broadband-speed-guide, Accessed 17 Nov. 2023.

Language Barriers and Accessibility

Signing up for internet service, including discounted internet plans for low-income households, is a challenge for LEP communities due to the lack of in-language support and outreach. CAA regularly shares government relief programs for internet affordability, but when residents and businesses run into issues or service disruptions, they do not receive timely and adequate technical support in-language.[68] While most internet providers offer assistance in Spanish, Chinese language translations are not as common, and the dominant language in Chinatown is Cantonese. Those we spoke to noted that a few internet service providers offer affordable internet packages, such as Comcast's Internet Essentials plan, but it is a tedious process and requires digital and English literacy to sign up. According to our conversations, AT&T and Comcast lack adequate customer and technical support in Cantonese. Additionally, a community partner shared that an internet service request can take three months to fix.[69]

Jessica Ho, government and community affairs director at North East Medical Services (NEMS), a health care provider for low-income Chinese seniors in Chinatown and North Beach, described her time-intensive efforts to connect patients to telehealth visits during the pandemic and her frustrations with how difficult the process was. Her efforts included talking to ISPs, state and local officials, and local nonprofits, securing grants to cover internet costs and devices, helping clients sign up for ACP, and partnering with a telehealth app called Doximity that uses text messages to connect patients with video conferencing. Still, she recognized that despite all her efforts, NEMS' predominantly low-income patients cannot afford monthly internet costs even with the $30 monthly credit. Jessica's experiences showed her that while these problems cannot be solved overnight, government officials need to treat broadband internet like a public good and resolve long standing infrastructure, affordability, and connectivity challenges.[70]

Overall, the general consensus among Chinatown residents and businesses is that internet speed is subpar, and despite advertising high-speed plans, internet service providers have not invested in infrastructure to support that claim or ensure timely technical support in-language. Chinatown residents are simply not getting the adequate internet service they pay for. In addition, our interviews demonstrated the countless hours spent and considerable efforts of staff at community-based organizations to support residents' everyday internet access needs, which results in additional labor costs for these organizations. As a result of poor access to reliable internet, children fall behind on learning; families are unable to connect to online essential services, careers, and job opportunities; seniors stay isolated; businesses lose out on profits; and overall; communities miss out on economic mobility.

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68 Lim, Amos. Email Interview. 9 June 2023.
69 Lim, 1.
70 Ho, Jessica. Interview. 27 Sept. 2023.

Recommendations

Internet access is a basic need and digital inequity is a significant issue for Chinatown residents and other low-income communities of color, impacting many facets of life, including one's livelihood and future economic opportunities. Chinatown community members have confirmed that the internet is slow, unreliable, and at times costly to the point where the speeds do not justify the price, cutting them off from transformative economic and educational opportunities. We call on our local and state elected officials and agency staff to take bold leadership to end digital redlining for Chinatown and other historically disinvested communities in San Francisco. Our recommendations include:

San Francisco Policymakers

1. **Expand the Fiber to Housing Program and free high-speed fiber internet to all low-income neighborhoods through robust community collaboration.** Government partners and ISPs regularly cite community distrust when discussing factors contributing to the digital divide, yet rarely acknowledge how that distrust is formed. We urge policymakers to work with community institutions and partners to build trust and collaborate with community stakeholders to bring broadband infrastructure and free fiber internet to historically disinvested communities. These communities rightly hold distrust of government intervention, and resources and time must be invested to repair harm and bring needed and long overdue infrastructure.

2. **Hold Internet Service Providers that service San Francisco residents accountable to providing low-cost, quality internet access.** ISPs do not provide guaranteed minimum speeds and use confusing pricing schemes, leaving consumers to take a chance on expensive internet service. However, ISPs can and should provide accessible coverage. For example, local ISP Monkeybrains serves over 20,000 addresses in the San Francisco Bay Area by providing coverage at an

affordable rate at guaranteed minimum speeds.[71] This is in direct contrast to the ISPs we evaluated in the report, which typically only gave maximum speeds. Monkeybrains offers residential addresses plans at $35/month, and does not vary the price of the plan across the city.

In addition, many internet subscribers do not receive timely and in-language support for service issues. ISPs must increase language accessibility for customers that have limited English proficiency. Customers cannot reap the full benefits of their plans if they cannot resolve technology issues.

In order to allow ISPs to do business in San Francisco, policymakers should:
   a. Require all ISPs publish guaranteed minimum speeds.
   b. Require all ISPs to provide price information, including price increases, time-limited discounts, and low-income plans in plain and accessible language.
   c. Require all ISPs to offer customer and technical support in the top 10 most-spoken languages in the city, according to the latest Census data.

3. **Publish the Digital Equity Scorecard by July 1, 2024 and commit to annual data collection and reporting.** San Francisco has not delivered on the promises made in the Digital Equity Strategic Plan, making it difficult for the public to assess progress on the initiatives set forth in the plan. In order to build trust between local government and constituents, we urge city staff to provide more timely and open sharing of progress and work done to close the digital divide. The city should develop, maintain, and publish a database of advertised speeds and pricing for each neighborhood and conduct speed tests to verify the speed data for accuracy.

State Policymakers

1. **Center marginalized community voices in broadband infrastructure plans and funding decisions.** The state has invested billions of dollars to address the unequal distribution of broadband infrastructure and availability. While this is a positive start, state policymakers must ensure funding is prioritized to low-income and historically under-invested communities.

2. **Establish regulatory authority over ISPs as any other public utility and break up ISP regional monopolies.** Broadband internet has long been viewed as a critical public utility and it should be regulated as such. No one has the power in the present moment to address these issues, so the state government should consider classifying the internet as a public utility with clear regulatory oversight and work to resolve ISPs that function as monopolies in regional markets.

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71   Monkeybrains. www.monkeybrains.net.

Conclusion

The lack of quality, reliable, and affordable internet in Chinatown functions as an example of how external policy decisions, lack of targeted investments, and societal neglect can lead to internet deserts, especially in communities of color and those without full language access. The overwhelming anecdotal evidence of subpar internet speeds from the San Francisco Chinatown community warranted a thorough investigation of the internet service across the city. Our internet speed and pricing research found that for AT&T, one of the largest internet service providers in San Francisco, addresses in high-poverty neighborhoods had far less access to plans with 100 Mbps or faster speeds compared to addresses in low- poverty neighborhoods. This means that the slower plans in high-poverty neighborhoods cost about the same as high-speed plans in low-poverty neighborhoods. Higher-poverty neighborhoods get less for the same price. Local leaders should require ISPs to publish minimum speeds in their plans for transparency to consumers and to achieve equitable broadband levels. These companies should be required to provide in-language assistance to consumers. San Francisco has made strides in connecting affordable housing developments to fiber internet. The city can go further and invest in free fiber internet to all low-income neighborhoods. In addition, San Francisco should conduct a wider study of more addresses to arrive at a more accurate picture of the real internet speeds that residents and businesses receive. With proper action, the residents of Chinatown and other low-income communities in San Francisco can reach the national standards of broadband speeds recommended by the FCC. We can achieve digital equity in Chinatown and the city as a whole.

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