# A Case for Digital Inclusion

## Systematically Bridging the Digital Divide

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Oakland urgently needs an innovative solution to address the digital inequality facing the City. In modern economies and societies, the inequalities caused by the Digital Divide mirror the social and economic inequalities that continue to plague this country. With the onset of the COVID-19 pandemic a spotlight has exposed the enormous inequality between those with the means, finances, and capabilities to take advantage of this new utility called the internet or broadband and those without. The inability to connect to this essential utility excludes the marginalized from educational and economic benefits available to those that who are connected. This disparity between the have and have-nots is commonly referred to as the *Digital Divide*. We believe the City must combat these inequalities by developing a program of *Digital Inclusion* with a strong bias towards or objective of *Digital Equity*. We defined Digital Inclusion as the active process of including residents and organizations in this technological ecosystem. We define Digital Equity as the critical lens used to ensure that historically underserved residents are equitably extended technological opportunity to meaningfully engage in our increasingly online society.

> ### THE BAY AREA DIGITAL DIVIDE
>
> **Today in the Bay Area, 1.5 million residents do not have access to a computer at home. 94,000 Oakland residents are without devices or Internet access – including 17,000 students[1]**

## Digital Inclusion

Digital Inclusion is typically viewed as having four main components: **Advocacy and Awareness, Internet Access, Devices, and Digital Literacy (skills)**. When successfully executed, it positively impacts these intersections of society: Education, Healthcare, Workforce (employment), and Economic Development. Empirical research[2] has linked high speed broadband access with increased productivity and key socio-economic benefits such as increased business efficiency and better access to healthcare. The research also suggests that high speed broadband drives adoption of evolved Internet use-cases such as online learning, commerce, travel, financial services, and online work collaboration. Further, it appears that the real gains are associated with both connectivity and the intensity of use, which reflects not only the extent of time online but also the range of services used, and the activities undertaken with them.

*Figure 1 - Digital Inclusion Component[3]*



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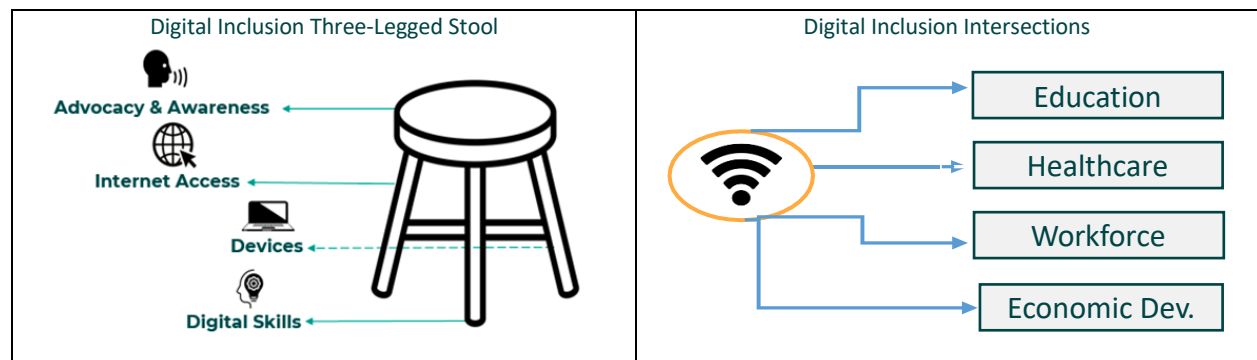
[1] www.techexchange.org/bay-area-access.html
[2] A 2013 study by Ericsson, Arthur D. Little and Chalmers University of Technology titled 'Socioeconomic Effects of Broadband Speed' using empirical data from 33 OECD member countries inferred that doubling broadband speeds can add 0.3 percentage points to GDP growth
[3] Figure 1 – Detroit Digital Inclusion One Pager

From a City of Oakland perspective, to effectively execute against the Digital Inclusion initiative requires the engagement of several City departments – Race and Equity, Economic and Workforce Development, Human Services, Housing and Community Development, Information Technology, and probably others. In this report we focus on Oakland's underserved communities, highlighting the need for a digital intervention to positively impact each of the societal intersections. We also summarize the progress that has been made to address the *Internet Access* leg of Digital Inclusion (Figure 1 - Digital Inclusion Component). By expanding the OAKWiFi public network into more of our communities we can make an even greater impact towards lessening the disparities and inequities borne by school-aged children, the unemployed and underemployed residents, and on small minority owned businesses.

According to the American Community Survey Data – S2808 year 2018, 24.2% of Oakland households (40,121) are without broadband access, 13.3% (22,026 households) have no internet at all, including via cellular data plans, and 8.8% (14,619) are only connect only through cellular data plans. Approximately 94,000 Oakland residents have no internet connectively or computing device. Through deployment of widespread free public Wi-Fi throughout our poorest communities, OAKWiFi can connect the residents of Oakland to knowledge and the broader global community. In today's connected world, access to the internet should be considered an essential service, like water or electricity. In 2018, 87 percent of
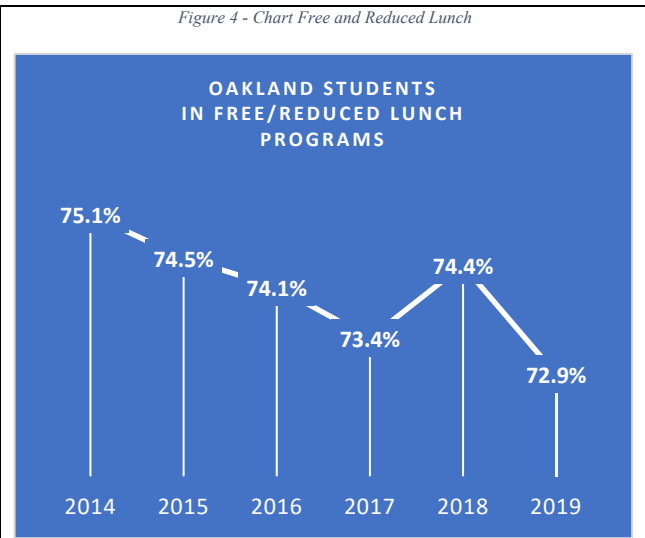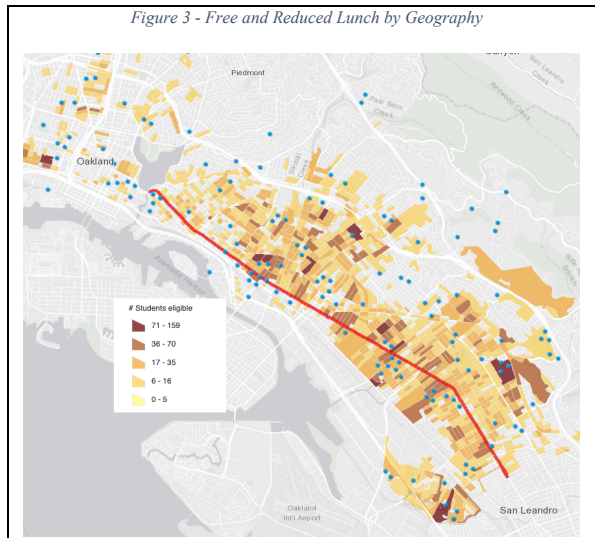


*Figure 2 - No Internet No Computer*
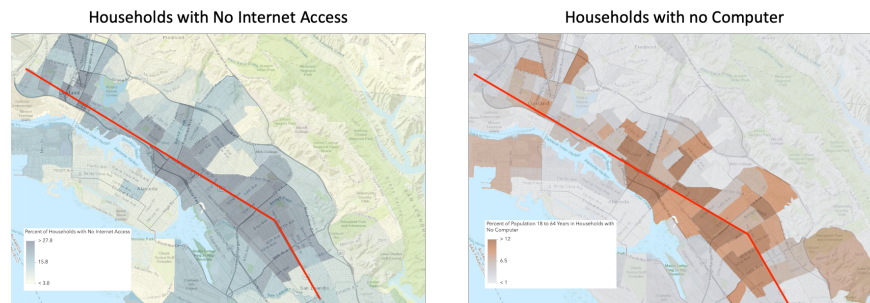
households with an annual income of $75,000 or more had access to the internet. In comparison, only 45 percent of households with an annual income of $30,000 or less had access to the internet.... Urban communities are less connected to broadband at home than suburban communities. The digital divide creates a steeper wall of inequity for communities of color that are more likely than their white counterparts to be disconnected.[4]  By providing broadband connectivity we are empowering the citizens of Oakland's underserved communities to seek out education, broaden their perspectives, seek and create new job opportunities.

## Education

Upon examining the patterns of the underserved school age children population, we find that it is heavily centered in the east and central part of Oakland as well as portions of west Oakland. When the demographics of income, educational attainment, free and reduced lunch, English as a second language, and others are plotted, we find that a large percentage of these children live in areas that straddle the BRT (Bus Rapid Transit) line. As can be seen in the following diagram a large percentage of students receiving free and reduced lunches cluster around the BRT line. It is safe to assume that a large percentage of these students are also unconnected or under-connected to the internet.

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[4] https://www.clasp.org/blog/digital-divide-builds-steeper-wall-inequality by Yesenia Jimenez

| Figure 3 - Free and Reduced Lunch by Geography | Figure 4 - Chart Free and Reduced Lunch |
|---|---|



As if these students were not already at a disadvantage, the onset of COVID-19 has exacerbated this inequity. The Alliance for Excellent Education websites states that "The COVID-19 crisis has disrupted nearly every aspect of our education system. Our most vulnerable students have been hit first and hardest by these disruptions. Without an intense and intentional focus on equity, they also will be the last to recover."[5] One estimate states approximately 17,000 Oakland Unified School District students are not connected and another estimates 25,000 students. Whatever the number, there are too many. These students cannot participate in remote learning, even if that's the only option available to them.

> *Arguably, this is something that schools should have been doing a long time ago, opening up the whole frontier of out-of-school learning by virtue of making sure that all students have access to the technology and the internet they need in order to be connected in out-of-school hours....Twenty-first century learning absolutely requires technology and internet. We can't leave this to chance or the accident of birth.*
>
> Paul Reville says COVID-19 school closures have turned a spotlight on inequities and other shortcomings - https://news.harvard.edu/gazette/story/2020/04/the-pandemics-impact-on-

Expanding the reach of OAKWiFi is not a panacea. It will provide an acceptable level of connectivity to a large number of students and equip them to better participate in the evolving twenty-first century systems of education.

## Healthcare

Even despite policy efforts aimed at reducing health related disparities, evidence mounts that population-level gaps in literacy and healthcare quality are increasing. This widening of disparities in American culture is likely to worsen over the coming years due, in part, to our increasing reliance on Internet-based technologies to disseminate health information and services.[6] The prediction in the previous sentence was written in 2008 and now in 2020 with the world experiencing the COVID-19 pandemic, the prediction is proving true. In a sign that COVID-19 continues to prey on society's most vulnerable, three patients in an Oakland nursing home have died, and 50 others have contracted the virus, comprising one of the largest clusters in the East Bay[7]. As depicted in Figure 5 - COVID 19 Cases by ZIP Code, Oakland's poorest neighborhoods are the most affected by the COVID-19 outbreak. We

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[5] https://all4ed.org/coronavirus-and-the-classroom-recommendations-for-prioritizing-equity-in-the-response-to-covid-19/
[6] Understanding Health Literacy for Strategic Health Marketing: eHealth Literacy, Health Disparities, and the Digital Divide Graham D. Bodie Mohan Jyoti Dutta
[7] https://www.mercurynews.com/2020/04/23/coronavirus-deaths-hit-oakland-nursing-home-with-covid-19-outbreak/

cannot with any level of confidence declare that access to the internet would have lessened the number of COIVD-19 cases in these communities. However, there is sufficient evidence to state that access to broadband does improve health outcomes, in general.

Given that broadband access intersects with so many previously identified social determinants (economics, education, etc.) of health, several national organizations have recently characterized broadband access as a "super-determinant" of health[8]. Again, expanding the OAKWiFi public network is not a panacea. However, based on the data, access to the internet has been shown to improve health outcomes. In an article published in May 2017, it was noted that - "Broadband access can play an important role in helping patients manage chronic diseases by providing online connections to providers, health coaches, or patient support groups… In addition to improving chronic disease management for underserved populations, more robust internet



**COVID-19 cases in Oakland**

*Figure 5 - COVID 19 Cases by ZIP Code*

access could play a role in curbing the opioid and substance abuse epidemic, ..."[9] In closing this section on healthcare, this passage succinctly summarizes the argument for Digital Inclusion: In the 21st century, opportunities for employment, education and healthcare are inseparable from Internet access. Virtual health possibilities are closing the gaps in healthcare with a sustainable care delivery model, but disadvantaged areas benefit the most when technology gaps are closed as well[10].
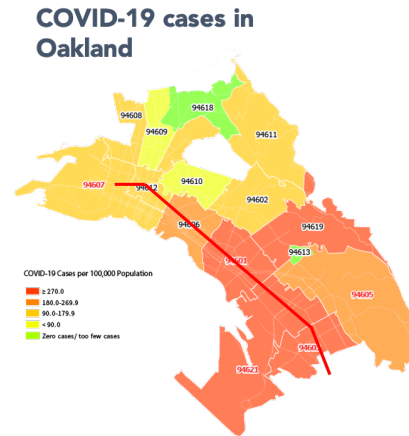
## Workforce

Just prior to the COVID-19 outbreak, the United States was in the midst of one of the longest periods of economic expansion in history. From 2009 through the first quarter of 2020 the country experienced record levels of low unemployment, even among minority groups, unprecedented growth of the stock market, and interest rates approaching zero. Despite this incredible period of growth, on average 20% of Oakland's communities of color remained in poverty and unemployment around 12-14%. With the onset of COVID-19 towards the end of the first quarter 2020, this period of growth ended abruptly and with it



**UI and Pandemic Unemployment Assistance (PUA) Claims Received**
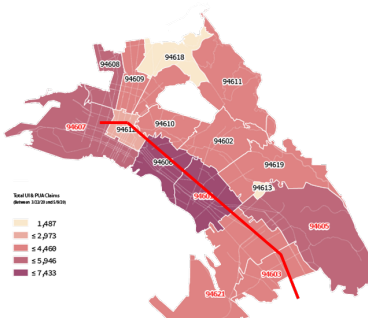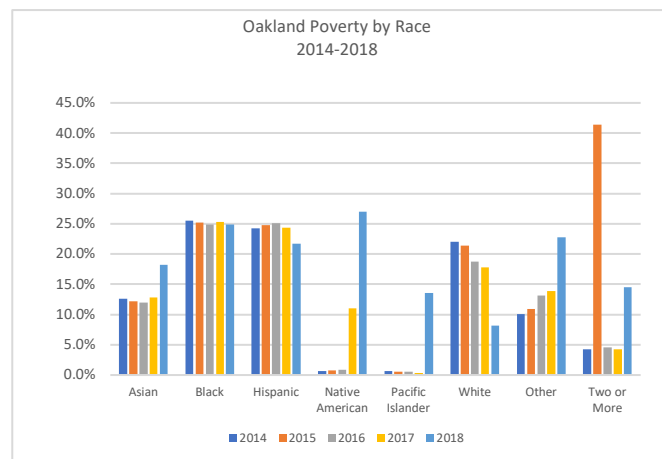**Between 3/22/20 – 5/9/20**

*Figure 6 - Unemployment Claims*



Oakland Poverty by Race 2014-2018

[8] B. Crock, Bauerly, "Broadband Access as a 'Super-Determinant' of Health," *Network for Public Health Law*, July 17, 2018, *available at* <https://www.networkforphl.org/the_network_blog/2018/07/17/1017/broadband_access_as_a_super-determinant_of_health>
[9] Bresnick, Jennifer https://healthitanalytics.com/news/amia-consider-broadband-access-a-social-determinate-of-health
[10] https://www.globalmed.com/bridging-the-digital-divide-expanding-internet-and-healthcare-access/

came double-digit unemployment. During the sustained period of economic growth minorities advanced the least. However, they were the most impacted by the sudden downturn. While minorities composed 37 percent of the labor force in February 2020, they accounted for 58 percent of the newly unemployed on March 14, 2020.[11] As illustrated in Figure 6 - Unemployment Claims, Oakland's vulnerable communities followed this trend; the darkest areas of the map represent the highest levels of unemployment in the city. COVID-19 did not create this situation; it exacerbated the job disparities that have existed for decades. The question at hand is how can we assist this population in finding employment and lift these families out of poverty? The chart on the right, shows the disadvantages of not having broadband access. The longer gray bars are the percentage of the survey group that would find it difficult to engage in the specified job seeking activity without having a broadband connection[12]. Back in the day, for those old enough to remember, most of these job seeking activities were done by reading a newspaper, typing a resume on paper, and applying for jobs in person. With an internet connection all of these things can be done online. In addition, the internet makes it possible to research the company, view the background of the hiring manager, look for personal connections among friends and associates, and increasingly with the pandemic continuing to spread, even do a virtual interview, never leaving the comfort of your home. **Broadband has become an indispensable driver of economic growth and workforce development**, creating new opportunities for Americans to participate in the modern, global economy and changing the way they find and do their jobs.  Broadband provides channels for sharing information, learning new skills for career advancement, and completing basic job functions in a number of professions[13].



**Non-broadband adopters face many challenges finding and applying for jobs online**

*% in each group who say it would NOT be easy to do the following if they needed to look for a new job*

■ Broadband at Home    ▫ No Broadband

Note: Findings based on those who are not retired or disabled.
Survey conducted June 10-July 12, 2015. Sample size = 2,001
PEW RESEARCH CENTER
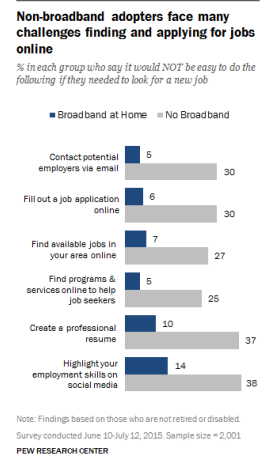
## Economic Development

The economic impacts of COVID-19 are being felt throughout Oakland, and Oakland's small businesses have been particularly hard hit.  According to a recent statewide poll by the Small Business Majority, 44 percent of small businesses in California have already closed or are planning to do so in the next two months because of the impacts of the COVID-19 pandemic.  The Department of Economic and Workforce Development recently conducted a survey of more than 1,000 Oakland businesses about the impacts of COVID-19.  Over 80% of responses were from small businesses with 10 or fewer employees, with 55 percent of business owners identifying as low- or very-low-income.  Almost 70 percent reported a decline of more than 40 percent in gross receipts year-over-year for March 2020.  The surveyed businesses also accounted for 2,780 jobs lost, with more than half located in low-income areas of Oakland.

The Bus Rapid Transit (BRT) development project offers hope for a vibrant transit-oriented commercial corridor. However, its construction and permanent infrastructure has disrupted some business operations. These businesses represent the ethnic diversity of Oakland. The majority of the businesses along the BRT route are very small, with annual gross

First construction, then coronavirus: Oakland businesses on new bus line waiting for help
*San Jose Mercury News May 19, 2020*

receipts of less than $100,000, including many small emerging businesses with ownership that reflects

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[11] US Bureau of Labor Statistics Household Survey
[12] Smith, A. , "Lack of Broadband Can Be a Key Obstacle, Especially for Job Seekers," Pew Research Center (December 28, 2015)
[13] https://www.ntia.doc.gov/blog/2016/access-broadband-fuels-workforce-development-and-enhances-job-skills

the rich diversity of Oakland. The sustainability of these small businesses is essential for Oakland's economic health, and digital connectivity is essential to the success of these businesses. Oakland's small businesses and workers need resources, training and technical assistance to develop a web presence and succeed in the online marketplace, which has become even more important in the COVID-19 economy. Since the start of the pandemic, multiple technical assistance providers have worked to help older business owners who do not use computers apply for stimulus funds online, but more access is needed to ensure that these businesses have the infrastructure and equipment to take advantage of available resources and succeed.

> "...where every student, regardless of the zip code they grew up in, has the opportunity to participate in and thrive in the tech innovation economy."
> *SMASH Vision Statement*

## Expanding OAKWiFi

The challenges that the lack of internet creates for our most vulnerable populations can be overwhelming. It impacts the ability of people to improve their skill sets, complete homework, apply for jobs, and collect information. More importantly, it mutes the voices of the diverse population that shapes our communities; it extinguishes dialogues of difference. While many organizations provide resources and programs to youth, the unemployed, the homeless, and small business none of these organizations can provide the infrastructure of high-speed no-cost internet and supporting services to the thousands of households and small businesses in need. This type of investment falls squarely on the shoulders of government. Strikingly, the current similarity of our communities of concern to those of the developing world are alarming. The Brookings Center for Technology Innovation published a paper outlining the challenges for the developing world[14]. Glaringly, they mirror those of our disadvantaged population as well:

– Poverty, expensive devices and high telecommunication fees.
– Poor infrastructure, digital illiteracy, and lack of digital trust.
– Policy, taxes and operational barriers.

Expanding the reach of OAKWiFi (internet access) is only one component of a successful Digital Inclusion Program, however it is the core component around which the other services advance. One of the core infrastructure components of any public Wi-Fi deployment is the availability of a backhaul. A backhaul is the use of communication systems (fiber, wireless, etc.) to get data from user endpoints to a node in a major network such as the Internet or the proprietary network of a large business, academic institution or government agency. For this purpose, the OAKWiFi network will rely on the fiber-optic network recently deployed as part of the Bus Rapid Transit (BRT) project.

## Importance of BRT Fiber

The BRT fiber is important not only because of its role has the fiber-backhaul to carry the data from the "wifi-zones" we will deploy across the City, but also because of how it aligns with a wide swath of the neighborhoods in need. Note the thick red line in all of the map diagrams we have included in this report. This line represents the BRT fiber. Also, note in each map how it dissects a several of the

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[14] https://www.brookings.edu/wp-content/uploads/2016/06/West_Internet-Access.pdf

neighborhoods most impacted by the Digital Divide and the COVID-19 virus. This is International Boulevard, a major heartbeat of the City. From this core backhaul we can connect additional fiber laterally into the neighborhoods to extend the reach of the WiFi deployment to a large percentage of the City. As part of the 2019 Master Fiber Plan Update, we have identified these lateral runs and how they can also connect remote City facilities back to the City's main network infrastructure.

## Streetlights

Another important component of our wifi deployment strategy is streetlights. Streetlights have been transformative to cities. Whether gas-based streetlights as introduced by Benjamin Franklin or electric-based streetlights as pioneered by Thomas Edison, each iteration improved on the previous model bringing increased safety, offering higher efficiencies, and leading to greater adoption. These streetlights represent thousands of potential wireless access points -- places to illuminate the night for wayfinding and safety, but also potential locations to begin the process of bringing high-speed internet to our underserved communities.

## Conclusion

In this paper we have focused on highlighting that the historically underserved communities of Oakland remain as vulnerable as ever and this vulnerability has been significantly increased as a result of the COVID-19 pandemic. We have made the case that providing these communities with broadband can improve outcomes in the intersections of

> In the 21st century, opportunities for employment, education and healthcare are inseparable from Internet access

employment, education, and healthcare, however, we caution that **Internet Access** alone is not enough. Without a program of **Advocacy and Awareness**, fighting for the vulnerable, establishing trust relationships, and informing them of the availability and benefits of internet access, internet access alone will not be successful. Without a program of providing free or low-cost **Devices** to connect to the
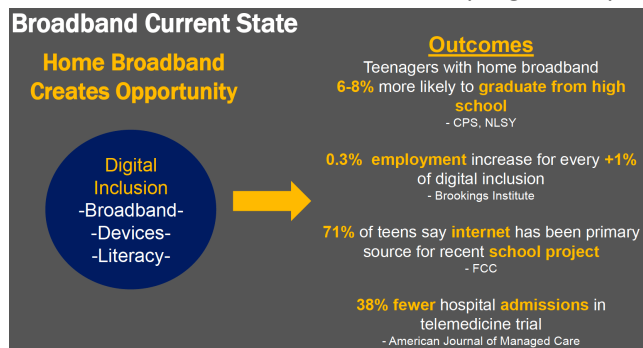


internet and training to improve **Digital Literacy** around proper utilization, internet access alone will not be successful. In summary, to be successful in lifting our vulnerable communities, we must establish a **Digital Inclusion Program** that, yes, supplies the core and essential leg of internet access, but also the supporting legs of devices, digital skills, and ongoing advocacy and awareness necessary to ensure that these residents and organizations are equitably

extended the opportunity to meaningfully engage in our increasingly online society. Oakland will not be a forerunner in this endeavor. Many cities across the country, including our neighbors in San Jose and San Francisco, have Digital Inclusion initiatives that we will learn from in developing our strategy and executing against it. In fact, this closing sentence comes directly from the San Jose Digital Inclusion Strategy Report. There is no silver bullet to closing the digital divide in Oakland, however a better coordinated effort across the public, private, and nonprofit sectors could significantly close the gap[15].

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[15] City of San Jose – Digital Inclusion Strategy Report – replaced "San Jose" with "Oakland"