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*"Trusted Partner and Provider of Choice"*

September 30, 2021

To: Supervisor Hilda L. Solis, Chair  
Supervisor Holly J. Mitchell  
Supervisor Sheila Kuehl  
Supervisor Janice Hahn  
Supervisor Kathryn Barger

From: Selwyn Hollins   
Director

**UTILIZING EXISTING INFRASTRUCTURE AND RESOURCES TO ACCELERATE  
DIGITAL EQUITY (ITEM #45G, AGENDA OF AUGUST 31, 2021)**

On August 31, 2021, the Board of Supervisors (Board) adopted a motion to assess viable options for the County of Los Angeles to facilitate residential access to reliable broadband service in low-income communities where greater than 20% of the households lack internet service, based on data from the United States Census Bureau's American Community Survey. The Board instructed the Internal Services Department (ISD), in consultation with the Chief Executive Office and County Counsel, to return in 30 days with a report that identifies options, cost estimates, and, to the extent possible, a funding source that would enable implementation of internet access to begin within the current calendar year of 2021. Additionally, the proposed options should be specific to a County-administered municipal broadband service, public-private partnerships, and amendments to existing agreements with internet service providers.

Summary

In Los Angeles County, it is estimated that approximately 365,000 households lack broadband internet service. The disproportionate impacts are mostly located in lower income communities and among populations that are predominantly Black and Latinx. Several government initiatives are underway to address this crisis, yet digital inequities persist in both rural and urban areas. A computer and reliable internet service are essential to accessing education, employment opportunities, healthcare services, financial resources, support networks, and commerce.

The challenge of universal broadband is complex, with no one approach capable of achieving all of the County's policy priorities. A multi-pronged approach recognizes that there are numerous technological approaches to delivering internet service; that the

digital divide is not just a product of internet access, but also numerous other socioeconomic realities; and that there is ample room for government, Internet Service Providers (ISPs), community-based organizations (CBOs), and other civic institutions to contribute to effective solutions.

The intent of this report is to outline options for the Board to consider that complement existing efforts toward achieving digital equity. ISD engaged a consultant to assist in evaluating alternative methods that can provide residential internet access to disadvantaged households in the context of three strategic, high-level approaches:

1. Utilize and expand subsidy programs that would enable Los Angeles County residents to use existing broadband networks in the County affordably.
2. Deploy Community Wireless Networks.
3. Develop new Fiber-to-the-Home (FTTH) networks to provide “future-proof” connectivity to residents.

Each option carries significant considerations with respect to cost, longevity, quality of service delivery to residents, and opportunity as an investment for the County.

For Option 1, ISD initiated a request for information (RFI) to elicit information from telecommunication carriers and ISPs on the availability and prices for connectivity in the impacted communities for up to 300,000 households. The prices ranged from \$10.00 to \$74.99 per month, with download and upload speeds ranging from 5 megabits per second (Mbps) to 1 gigabit per second (Gbps). Some respondents included provisions for free equipment or devices, and some identified minimum levels of households and minimum annual commitments. All required direct payment by the County on behalf of the residents. Each respondent offers various social responsibility programs and participate in Federal and State subsidy programs that also defray the costs of broadband connectivity. The deployment of this option would be the quickest to implement and potentially cover a massive number of households at below market rates. The County could leverage its existing contract assets and forego capital improvements by relying on carrier and ISPs existing infrastructure. If the Board decides to pursue a subsidy option, more detailed information and negotiations would be required prior to finalizing any contract actions.

Option 2 offers the County the potential of rapid deployment with consistent user experiences for households and potential service improvements over time. The County will be able to control the footprint and quality of service of its networks, and there may be opportunities for internet cost savings. The County could also partner with community-based organizations to employ community “Digital Navigators” who would provide

technical support. This option has the advantage of directly delivering service under the County's oversight while maximizing the potential for partnerships in the communities most affected by the digital divide. It can be deployed rapidly and begin connecting households within months of the Board's determination to move forward.

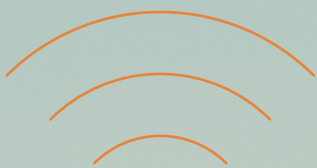
Option 3 also offers the County control of the network and service delivery with a consistent experience to households in need and potential service improvements over time. This option "future-proofs" the services while offering the most robust, fastest, and reliable service. Deployment would take several years and substantial financial investments, but could be advantageous with long-term economic and jurisdictional authority to achieve and sustain digital equity.

The attached report discusses service options in more detail.

If you have any questions, please contact me at (323) 267-2101.

Attachment

c: Executive Office, Board of Supervisors  
Chief Executive Office  
County Counsel



# FREE BROADBAND FOR THE RESIDENTS OF THE COUNTY OF LOS ANGELES:

An action plan for community wireless  
networks to build digital equity

SEPTEMBER 2021

PREPARED FOR:



INTERNAL SERVICES  
DEPARTMENT  
COUNTY OF LOS ANGELES

PREPARED BY:



Broadband Equity Partnership

HR&A  
Analyze. Advise. Act.

ctc technology & energy  
engineering & business consulting

# Acknowledgments

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In July 2021, the County of Los Angeles (the County) Internal Services Department (ISD) engaged HR&A Advisors, Inc. and CTC Technology and Energy – together, the Broadband Equity Partnership, a mission-driven consultancy focused on equipping communities with the tools they need to close the digital divide sustainably – to develop a Community Broadband Action Plan for Los Angeles County. This plan has been shaped by multiple motions of the County Board of Supervisors and informed by the actions of other County leaders and interviews with dozens of stakeholders across the County, as well as with internet service providers (ISPs) from around the country.

This plan was developed for ISD by the Broadband Equity Partnership, which brings more than four decades of experience in similar work, including economic development, real estate, and organizational design work for and in the County of Los Angeles. The Broadband Equity Partnership is a mission-driven consultancy powered by HR&A Advisors, Inc. and CTC Technology and Energy.

HR&A is a 100% employee-owned firm, founded in Los Angeles, with a history of shaping policy in the county and rapidly growing practices focused on centering racial equity and economic empowerment in urban policy, planning, and economic development, including with universal broadband. HR&A's work turns vision into action through rigorous analysis, strategy development, and implementation planning. HR&A has served a diversity of clients – real estate owners and investors, hospitals and universities, cultural institutions, community development organizations and governments – since 1976.

CTC is a woman-owned business that has provided public interest internet consulting for the public, nonprofit, and institutional sectors for nearly four decades. CTC offers a unique combination of qualifications and capabilities in network engineering and strategic planning, financial analysis and business planning, rural broadband solutions, partnership strategies, wireless facilities siting and application management, and digital equity and inclusion planning. CTC is not affiliated with equipment manufacturers, communications carriers, cable operators, or construction contractors. CTC's consulting philosophy is focused solely on meeting clients' needs and protecting their interests.










# Introduction

There are 365,000 Los Angeles County households that lack broadband internet service<sup>1</sup>. Numerous initiatives are underway to address this crisis, including new sources of infrastructure and municipal bond funding from the State of California (Senate Bill 156)<sup>2</sup>, the Los Angeles County Economic Development Corporation's (LAEDC) *Digital Equity Action League*<sup>3</sup>, the County of Los Angeles (the County) Department of Public Works' (DPW) Bridging the Digital Divide initiative, and the *Delete the Divide*<sup>4</sup> portal with public and private support for streamlining access to existing programs. Certain cities in LA County, Internet Service Providers (ISPs), and nonprofits have also proposed and occasionally implemented new initiatives to address the challenge. Nonetheless, initiatives focused on fiber infrastructure deployments will take years to implement, and subsidy-based programs have thus far proven to be inadequate and out of reach of too many LA County households.

Recognizing this crisis with renewed urgency, the County of Los Angeles Board of Supervisors (the Board) passed a motion on August 25, 2021, directing the County of Los Angeles Internal Services Department (ISD) to "report back to the Board in 30 days with viable options for the County to facilitate residential access to reliable broadband service in low-income communities where greater than 20% of the households lack internet service, based on data from the United States Census Bureau's American Community Survey, and identify options, cost estimates and, to the extent possible, a funding source that would enable implementation of internet access to begin within the current calendar year of 2021, with the proposed options to be specific to a County-administered municipal broadband service, public-private partnerships, and amendments to existing agreements with internet service providers."<sup>5</sup>

**In response to the Board's request, this plan seeks to achieve three goals:**

- 1**  **Provide low-income LA County residents with free broadband access in their homes as quickly as possible;**
- 2**  **Develop solutions that the County of Los Angeles is well-prepared to deliver, using existing institutional capacities, real estate assets, and procurement vehicles; and**
- 3**  **Advance scalable connectivity solutions that have a clear path to implementation and may be refined as lessons are learned through deployments in LA County neighborhoods.**

If this plan is adopted, including allocation of necessary funds for implementation, County government can begin implementation by the end of 2021, provide free broadband to approximately 12,500 LA County households in neighborhoods with the lowest adoption rates within the next two years, and develop several new tools to accelerate the County's efforts to reshape the internet service marketplace in Los Angeles towards one that is more equitable, just, and resilient.

This plan provides a blueprint for the County of Los Angeles to take bold action to address the digital divide swiftly and sustainably by deploying community wireless networks.

1. 2019 U.S. Census Bureau
2. [League of California Cities](#)
3. [LA Digital Equity Action League](#)
4. [Delete the Divide](#)
5. [County of Los Angeles](#)

# Piloting a New Approach for Los Angeles County

The challenge of universal broadband is complex, with no one approach capable of achieving all the County's policy priorities.

Instead, a multi-pronged approach is prudent, recognizing that there are numerous technological approaches to delivering internet service; that the digital divide is not just a product of internet access, but also numerous other socioeconomic realities; and that there is ample room for government, ISPs, community-based organizations (CBOs), and other civic institutions, and the private sector to contribute to effective solutions.

Considering the recent motion, this report outlines options for the Board to consider that complement existing efforts. This report recommends the Board adopt a plan and allocate funds towards piloting a new approach to close the digital divide for thousands of LA County households: develop County-sponsored community wireless networks.

**Specifically, this plan calls for a pilot program to provide free broadband service to thousands of the neediest households with the following approach:**



**Develop Community Wireless Networks** that utilize Citizens Broadband Radio Service (CBRS) and unlicensed 5 GHz wireless antennas mounted on County-managed real estate assets and privately-owned sites whose owners will make their buildings or billboards available for the network;



**Install Customer Premises Equipment (CPE) radios and routers at the homes of eligible LA County residents**, initially focused on four areas of the county with some of the lowest levels of broadband adoption – the neighborhoods around the I-110 Corridor, East Los Angeles, the Alameda corridor around Tweedy Boulevard, and the rural Antelope Valley – and deployed in partnership with community-based organizations, generating well-paying jobs for residents in these communities whenever possible;



**Procure a Managed Service Provider (MSP)** or multiple MSPs to provide network development and management services under County oversight, working in collaboration with community-based organizations for local hiring;



**Create an inter-agency Pilot Program Management Team**, with representatives of entities with vested interests in this effort – the Board of Supervisors, the County of Los Angeles Chief Executive Office (CEO), including the CEO Chief Information Office (CIO) and Anti-Racism, Diversity, and Inclusion (ARDI) unit, ISD, and DPW – to be supported by a professional program management team experienced with wireless network deployments, with the mandate to ensure that County real estate assets and relevant permits are secured efficiently and to monitor pilot program progress to inform its refinement and the development of further County actions.

Over time, this program may be augmented by other County actions, including the deployment of County-owned fiber to serve both County agency use and Community Wireless Network management, integration of consumer subsidy programs, which may support ongoing operating costs for the program, the development of workforce development programs to benefit LA County residents, and more expansive partnerships with private sector and nonprofit partners across the county.

Over time, this program may be augmented by other County actions, including the deployment of County-owned fiber to serve both County agency use and Community Wireless Network management.



# 12,500 Households, 50 Distribution Sites, 2 Years

Community wireless networks as proposed in this plan have been deployed successfully in several cities around the country, often by nonprofit organizations, some school districts, and smaller ISPs seeking to compete with incumbent ISPs. Notable examples that use similar technical solutions include:

- **Connected Beyond the Classroom<sup>6</sup>:** Sponsored by the City of San Antonio and including eight independent school districts, Texas A&M University San Antonio, Methodist Healthcare Ministries of South Texas, and the publicly owned electric utility CPS Energy, Connected Beyond the Classroom leverages 1,000 miles of public fiber on street poles to provide wireless connectivity to up to 20,000 student households in 50 neighborhoods.<sup>7</sup>
- **NeuBeam<sup>8</sup>:** Established by Garrett County, Maryland and the Appalachian Regional Commission in partnership with Declaration Networks, NeuBeam leverages fiber and wireless to deliver high-speed internet in a growing coverage area of over 3,000 homes and businesses.<sup>9</sup>
- **Tucson Community Wireless Program<sup>9</sup>:** The City of Tucson, Arizona partnered with JMA and Insight Enterprises to build wireless connections to over 1,000 student households, and is considering network expansion.<sup>11</sup>

A similar approach, operating at a larger scale, can be deployed to serve approximately 12,500 households over the next two years. These households will receive broadband service beamed from the rooftops of County-managed real estate assets, billboards, and privately-owned sites – “Distribution Sites” connected to gigabit-speed uplinks. Each household will receive a small antenna to be installed on the outside of their home with line-of-sight to a Distribution Site. This “Customer Premises Equipment” (CPE) will connect by wire to a router inside their home to broadcast Wi-Fi for household use.

Using Citizens Broadband Radio Service (CBRS) and unlicensed 5 GHz spectrum for these wireless connections, this approach will be capable of delivering reliable broadband speeds of 25/3Mbps or better to approximately 250 households who live within ½ mile of each Distribution Site. This free broadband service will be a marked improvement in options for low-income households in these neighborhoods, many of which have no internet choice accessible or affordable to them today. While 25/3Mbps is a baseline for broadband services, and not a preferred standard for LA County, this plan prioritizes free service for as many households as possible, delivered as quickly as possible. As wireless technologies improve, the same Distribution Sites developed through this plan may be used to deliver higher speeds and/or more connections for service.

The neighborhoods suggested in this plan, identified below, are particularly well-suited to this approach. They are in areas with some of the lowest levels of household broadband adoption, and they feature relatively uniform building typologies of single-story homes, often with few vertical obstructions that may interfere with wireless radio signals. These factors and the potential high-profile nature of a deployment at this scale, free to residents of Los Angeles County, may also enable the County to attract cutting-edge providers to prove new field equipment capable of even higher bandwidth or of serving more households from a single Distribution Site.

This plan prioritizes free service for as many households as possible, delivered as quickly as possible.

6. [Covid 19 San Antonio](#)
7. [Texas Public Radio](#)
8. [Garrett County Government](#)
9. [Garrett County Government](#)
10. [City of Tucson](#)
11. [Fierce Wireless](#)

# PRIMER: A COUNTY-CONTROLLED COMMUNITY WIRELESS NETWORK

The following model can provide service at the current FCC broadband definition of 25/3Mbps<sup>12</sup> to a subset of LA County residents and is a first step to faster speeds as wireless technologies evolve. It is well-suited to a physical environment like the Los Angeles area, because it can readily serve single-family and multi-dwelling buildings that are the most common types of residences in most of the area, from a rooftop antenna up to ½ mile away.

Future generations of technology may be able to serve more residents at higher speeds, as these speeds will not be sufficient in the long run, but the technological approach presented here makes the most of the available wireless spectrum and uses leading-edge technology.

Using a combination of technologies including unlicensed 5 GHz and Citizen's Broadband Radio Service (CBRS), this fixed wireless model can be relatively quickly built over a period of weeks after procurement is completed, using the rooftops of potentially suitable County facilities and possibly other private buildings in the future. The addition of other public and privately-owned rooftops and infrastructure, including streetlight poles, utility poles, standalone poles, and billboards may also add to the potential coverage area in the future. These may belong to other public agencies or private partners who can support the community wireless networks with their real estate and infrastructure.

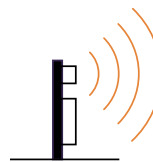
This model considers the rooftops of all County facilities above three stories as potential radio locations and determines the maximum number of potential subscribers that could be served under different parameters. The height cutoff of 60 feet ensures the antennas would provide a quality signal over a large area, and excludes small buildings that may not be sufficiently robust for a rooftop antenna mount.

County-owned real estate includes well-developed telecommunications infrastructure (Building Entrance Facility Room, etc.) and the County provides significant subject matter expertise in telecommunications. In some instances, it also controls structures that can securely house access points and connect them to the internet backbone. Using County-owned real estate can expedite network build-out, as it eliminates the step of negotiating agreements for construction and access with private property owners.

Fixed wireless technology will be used for this first-stage, rapid deployment as it is an option available to the County, which does not have its own licensed spectrum, and because a widespread build-out of wired infrastructure, such as fiber optics to the premises (FTTP) would take longer to design and build.

To accommodate rapid deployment, the County would need to acquire separate 1 Gbps connectivity at Distribution Sites. The existing network connections at County buildings do not have sufficient capacity to support Community Wireless Networks. Furthermore, there may be limitations in the contract between County agencies and existing service providers that preclude the use of the capacity for public-facing networks. There are also potential information security risks should the County use the same network infrastructure to carry traffic for both County and public use.

## THE FIXED WIRELESS NETWORK CONSISTS OF:



**Distribution sites, which house the antennas and other network components, and**



**Customer premises equipment (CPE) including antennas and routers to deliver home Wi-Fi.**

The Distribution Site radios on the rooftops, pole tops and billboards will connect to 1 Gbps connections. Those radios will transmit about ½ miles to hundreds of antennas in the neighborhood on home rooftops, which are smaller, rectangular variations of the type of antenna used for home satellite services. This CPE antenna will be installed by a Managed Service Provider and connected over a cable to a router inside the house, which will transmit internet over Wi-Fi. Residents could connect any Wi-Fi enabled device to that router.

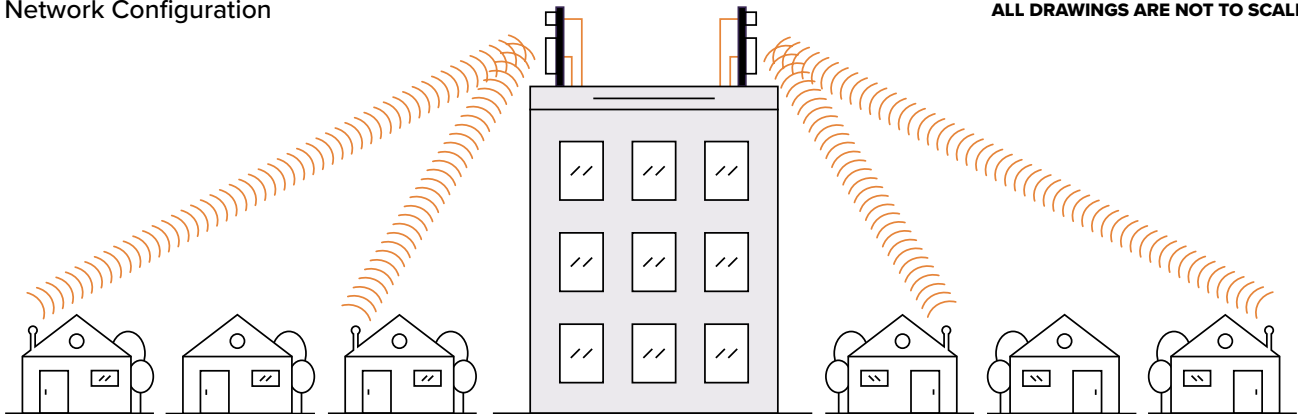
12. [Federal Communications Commission](#)

# COMMUNITY WIRELESS NETWORK CONFIGURATION

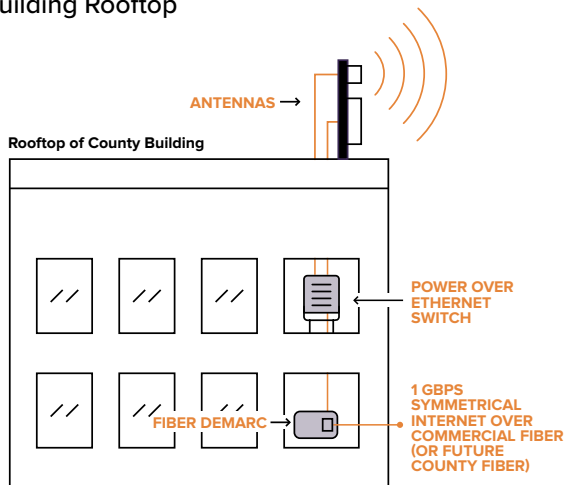
The proposed configuration, including a Distribution Site and surrounding residences, is illustrated below. The outdoor-mounted CPE antenna at the residence provides the needed line of sight to the Distribution Site antenna.

## 1. Network Configuration

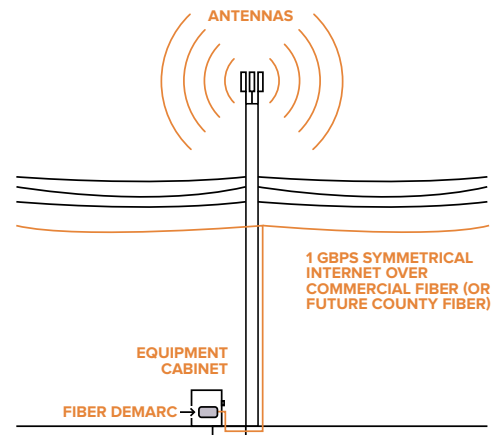
ALL DRAWINGS ARE NOT TO SCALE



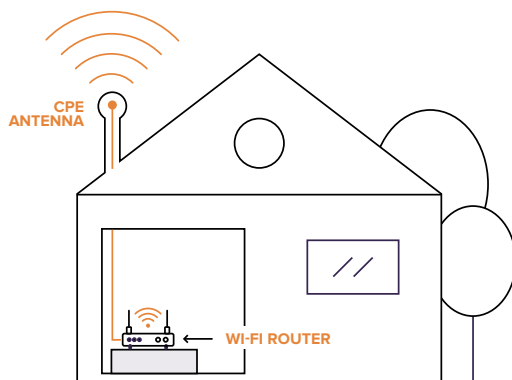
## 2. Distribution Site Configuration— Building Rooftop



## 3. Distribution Site Configuration— Utility Pole



## 4. Residence Configuration



In the future the County will consider its own “middle mile” network deployment, such as building its own fiber or acquiring or leasing fiber strands from commercial providers, which may provide a flexible solution to support a public network and may provide significant long-term savings in the County’s network expenses.



# Pilot Program Costs

Precedents from other relevant deployments, including conversations with equipment providers, MSPs, and ISPs, inform the following cost estimates for this readiness plan. The largest expenses are required in the first two years for the deployment of relevant infrastructure assets, including Distribution Site setup and Customer Premises Equipment installation. Thereafter, ongoing program expenses are anticipated to range from \$8-\$18 per month per household connected.

**Costs for this program are expected to total \$37.9M over five years, and may be considered in the following categories:**

**\$15.4M**

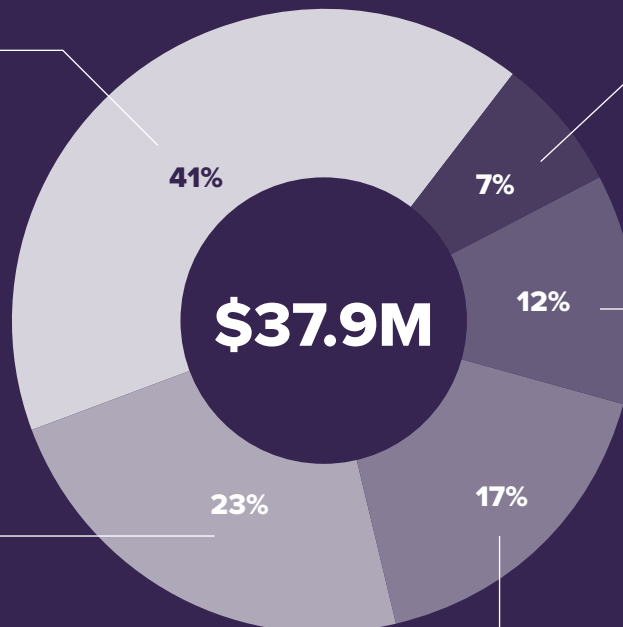
**Customer Premises Equipment & Installation:**

These costs cover the purchase and installation of Customer Premises Equipment antennas, associated wiring and mounting equipment, and Wi-Fi routers for in-home use by residents.

**\$8.7M**

**Other Costs and Contingencies:**

Each figure above is a preliminary estimate. Indeed, by soliciting bids from MSPs, with price as a determining factor for selection, the County may be able to deliver service to more households with these levels of funding. Nonetheless, there will be additional program-related costs that merit additional funding allocation. This \$8.7M sum includes estimates for those other program costs and contingencies that are prudent in this early stage of planning.



**\$2.7M**

OVER 5 YEARS

**Program Design, Management and Partnerships Costs:**

These costs cover the role of a Digital Equity Officer at the County to oversee the Community Wireless Network program, and a budget for limited grants to Community-Based Organizations in each of the four Target Neighborhoods to fund Digital Navigators.

**\$4.7M**

**Distribution Site Setup:**

These costs cover the engineering, design, and installation of an array of wireless antennas, network switching equipment, and associated passive and electrical infrastructure necessary to construct 50 resilient and reliable Distribution Sites.

**\$6.4M**

OVER 5 YEARS

**Annual Network Operations:**

These costs cover bidirectional gigabit internet service to Distribution Sites as well as general equipment maintenance necessary at both Distribution Sites and residences.

**This model of service will not charge households to access the network. This feature has the advantage of reducing the capital and operational costs of managing billing and fulfills the mission of providing high impact to the low-income LA County residents who need the service. While these cost estimates are required to launch this program successfully, the County may expect these costs to reduce over time on a per-household basis as processes are optimized, and as there are greater economies of scale in a larger network.**

# DISTRIBUTION SITE AND CUSTOMER PREMISES BILL OF MATERIALS

## Distribution Site Bill of Materials

Item	Unit Cost	Quantity	Cost per Distribution Site
5 GHz or CBRS Antennas	\$2,500	6	\$15,000
Network Switch	\$14,000	1	\$14,000
Cables, Power, Mast, Miscellaneous	\$9,000	1	\$9,000
Engineering, Design, Installation	\$58,000	1	\$58,000
<b>TOTAL</b>	<b>\$96,000</b>		

## Customer Premises Bill of Materials

Item	Unit Cost	Quantity	Cost per Distribution Site
Subscriber Module/Antenna	\$500	1	\$500
Wi-Fi Router	\$60	1	\$60
Cables, Power, Bracket, Miscellaneous	\$200	1	\$200
Engineering, Design, Installation	\$500	1	\$500
<b>TOTAL</b>	<b>\$1,260</b>		

# Potential Sources of Funds

While the County’s annual capital and operating budgets could be allocated to this program – indeed, these program costs to provide essential infrastructure services would be a small fraction of the \$1.5 billion allocated to the County’s water resources in FY21-22, or \$720 million allocated to transportation<sup>13</sup> – there is a broad and growing array of potential funding sources from the State of California and the Federal Government for which this program would be well-suited. These potential sources may include:

## AMERICAN RESCUE PLAN

- + **Capital Projects Fund (\$550M for the State of California):** This \$10B fund, for which the State of California has received an allocation of \$550M, has a special focus on supporting reliable, affordable broadband infrastructure and other digital connectivity technology projects and to improve equity in access to critical services. At least \$20M of the proposed program budget should be an eligible use of this fund. The State of California must request funding by December 27th of this year.
- + **State and Local Fiscal Recovery Funds (\$65.1B):** This fund is accessible to the County and has flexible purposes of stabilizing the economy, improving the well-being of households, and can explicitly be used for investments in broadband infrastructure.

## CALIFORNIA AB/SB-156

- + **Middle-Mile Network Funding (\$3.25B):** Given the need in the neighborhoods included in this plan and the status of many County-controlled sites as Community Anchor Institutions, connecting Distribution Sites to open-access fiber may be an eligible use of these funds.
- + **Last-Mile Network Funding (\$2B):** This funding is mainly considered for rural areas considered “unserved” by commercial providers which should make the Antelope Valley eligible; as proceedings open at the CPUC to implement this funding program, the County may provide commentary with evidence of the importance of funding last-mile networks in urban areas with very low adoption.

## INFRASTRUCTURE INVESTMENT AND JOBS ACT

(PENDING CONGRESSIONAL APPROVAL)

- + **Broadband Equity, Access and Deployment Program (\$44.2B):** If this bill becomes law, the County could make significant use of this funding for this program. Each state will receive a minimum of \$100 million, with the rest calculated based on funding need. \$42.45B is expected to be in the form of grants to States and municipalities that may cover all categories of costs associated with this program, and an additional \$2.75B allocation in the Digital Equity Act of 2021 would be a priority funding source for the Digital Equity Officer, Digital Navigators, and additional planning efforts. While the County is hopeful that this funding will materialize, it will take time and may be considered as a priority funding source for program expansion following the pilot period.

## PRIVATE PARTNERS

- + **The County may position this project for funding and in-kind support from potential private partners in LA County, as well.** For example, real estate owners may choose to dedicate their rooftops or billboards for Distribution Sites, philanthropies or equipment providers could contribute routers or other devices, and Community-Based Organizations could fund Digital Navigators from existing funding streams, among many possibilities for private sector support.

The County of Los Angeles Anti-Racism, Diversity, and Inclusion Initiative (ARDI) should be consulted to ensure that program design is consistent with Board and funding sources equity requirements, especially in consideration of the equity focus of the proposed program<sup>14</sup>.

13. [County of Los Angeles DPW](#)

14. [County of Los Angeles CEO](#)



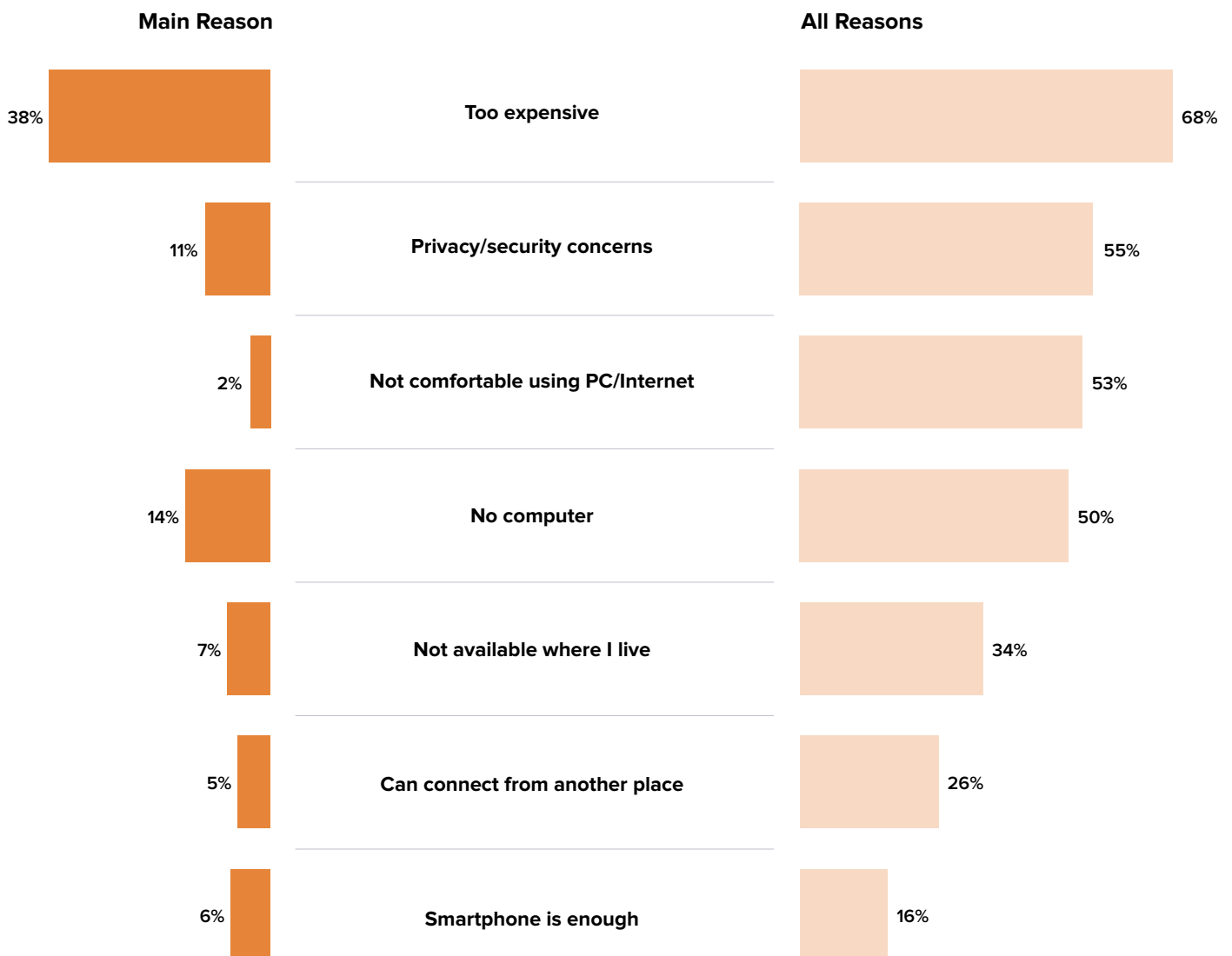
# Prioritizing Areas for Pilot Program Service

The 365,000 households in Los Angeles County that lack broadband service at home<sup>15</sup> highly intersect with poverty and racialized indicators. As of March 2021, more than a quarter of low-income Californians are unconnected or under-connected to broadband at home; Latinx, Black, and Asian-American households are over-represented among the unconnected compared to white Californians.<sup>16</sup> As California's most populous county and with the state's largest population of non-white residents, LA County is at the forefront of the inequities of the digital divide in both its urban and rural locales. Moreover, the County must pay special attention to the sizable number of undocumented residents who face additional hurdles to take advantage of existing programs for internet adoption.

15. 2019 U.S. Census Bureau

16. [CETF-USC Statewide Broadband Adoption Survey: Internet Adoption and the "Digital Divide" in California. March 2021.](#)

## Self-reported reasons for lack of internet connectivity at home among unconnected and under-connected

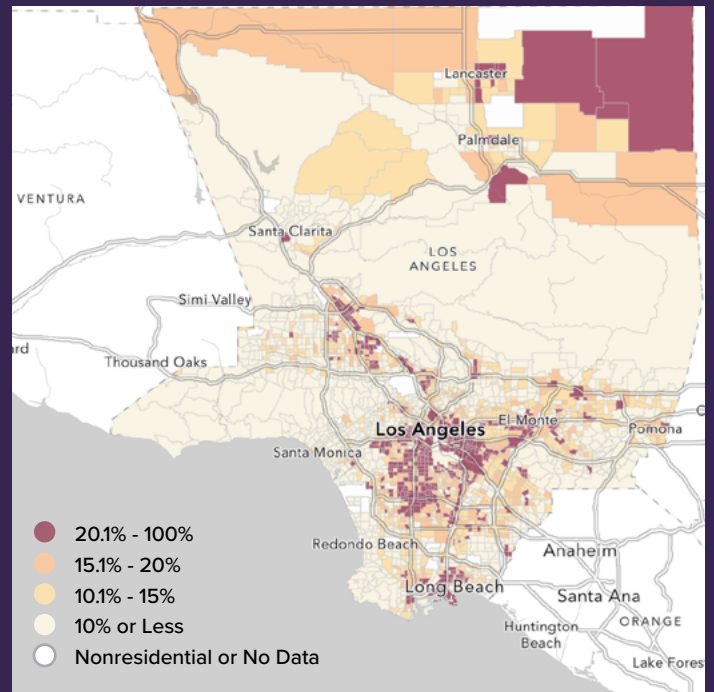


## The Digital Divide in Los Angeles County

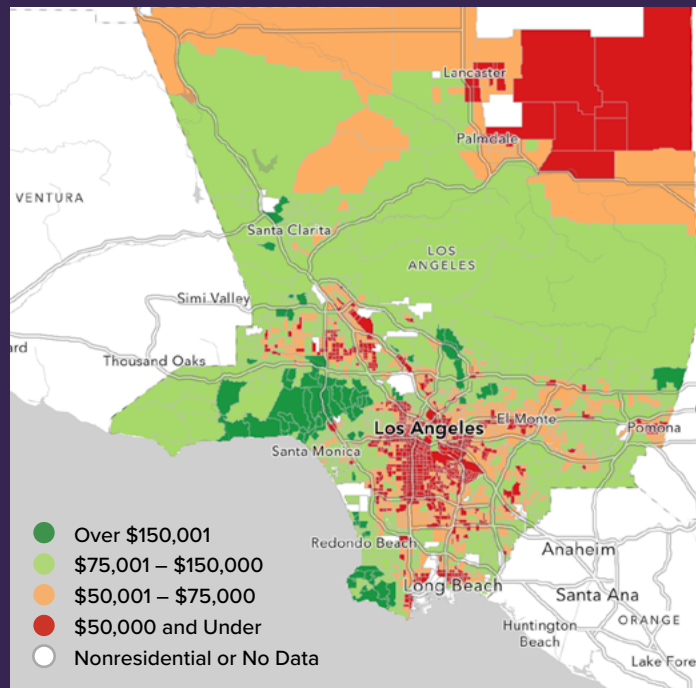
An analysis of US Census American Community Survey data reveals that the LA County geographies in which more than 15% of households report no internet connection and no computer at home are highly correlated with neighborhoods where median household income is \$75,000 or less. This is notable because the broadest qualification for the Emergency Broadband Benefit – the current \$50-per-month subsidy available through ISPs from the Federal Government – is household income at 135% of the federal poverty level, which requires a family of four to make less than \$36,000 to qualify. The market has failed to deliver usable or affordable broadband services to these households.

Source: [Delete the Divide](#)

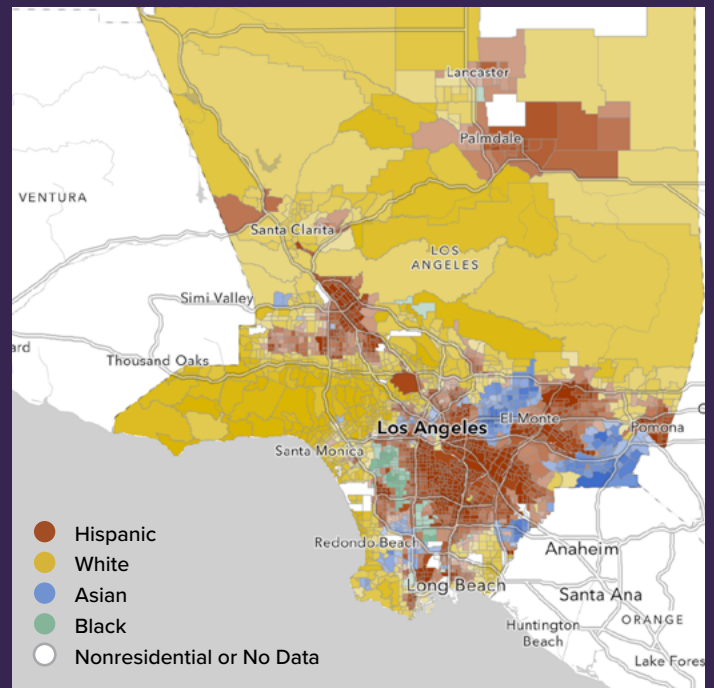
### 1. Percent of households with no internet access



### 2. Median household income



### 3. Predominant race by census tract



This gap represents a significant space for intervention, which the County can address through this plan by focusing on the neighborhoods with the lowest adoption. The recommended first-phase implementation selects approximately a dozen distribution site locations in four Target Neighborhoods, chosen for their low household broadband adoption rate and diversity of demography and geography. Such an initial phase of program implementation is designed for speed of deployment on County-controlled real estate, in some of the neighborhoods with lowest broadband adoption, and would inform program improvements as the County expands from a dozen sites to approximately 50 sites in multiple neighborhoods. These initial deployment neighborhoods include:

1. **The I-110 corridor in southern Los Angeles**
2. **The Alameda St. corridor near Tweedy Blvd.**
3. **East Los Angeles**
4. **Antelope Valley**

This gap represents a significant space for intervention, which the County can address by focusing on the neighborhoods with the lowest adoption.

## SAMPLE CWN COVERAGE MAP

These images show what possible coverage would look like from a dozen potential Distribution Sites distributed throughout the four Target Neighborhoods. Each circle has a radius of  $\frac{1}{2}$  of a mile and covers thousands of households. Since each Distribution Site can only support approximately 250 households due to spectrum constraints, more Distribution Sites – even with overlap – would connect more households to the network.

\* Locations include County-managed sites and possible future monopolies.

### I-110 Corridor and Alameda St. Corridor\*



### East Los Angeles



### Antelope Valley





# Program Governance and Management

This plan responds to the Board's request with a focus on the recommended approach of a **County-administered Community Wireless Network**. The County can lead development of this program with the concerted guidance of its agencies and capacities. The pilot program for these Community Wireless Networks may be best overseen by a Steering Committee of four County entities:

**1. The County of Los Angeles Board of Supervisors:** The Board of Supervisors, which initiated the request for options to close the digital divide in LA County, can provide overall program guidance and additional direction to relevant implementing agencies, as necessary;

**2. The County of Los Angeles Chief Executive Office:**

- a. The Anti-Racism, Diversity, and Inclusion Unit can ensure the most disadvantaged geographies and people are prioritized as the County considers reallocating existing and new investments to effectively target them;
- b. The Chief Information Office can ensure alignment with County-wide information technology policies; and
- c. The Asset Management Branch can ensure appropriate selection of County properties for distribution sites and facilitate make-ready work as necessary.

**3. The County of Los Angeles Internal Services Department:** ISD, which has studied the options best available to achieve the County's digital equity goals in the short-term, can build on expertise developed through engaging with telecom companies, developing this plan, and providing technology services to other agencies including through technology vendors;

**4. The County of Los Angeles Department of Public Works:** LACo DPW can coordinate asset deployment on poles including both fiber and wireless access points, and can support coordination with other digital divide work, including the Bridging the Digital Divide Task Force.

This plan calls for principals of these four entities to form a Steering Committee for project implementation. This Steering Committee would direct the work of a Digital Equity Officer as overall program lead, working for a Lead Agency selected by the Board and responsible for overall program success; an Interagency Project Management Team; the Managed Service Provider; Digital Navigators; and other Private and Nonprofit Partnerships. Each of these primary responsibilities is detailed as follows.

This plan calls for principals of these four entities to form a Steering Committee for project implementation.

### Digital Equity Officer

This plan calls for the assignment of a Digital Equity Officer to oversee implementation and serve as the primary point of contact for the selected MSP(s). The Digital Equity Officer would be responsible for:

- Leading the overall program, including managing the Managed Services Provider;
- Coordinating outreach and awareness to secure household signups with partner organizations;
- Coordination between the County and community stakeholders.

### Interagency Program Management Team

Managed Service Providers will only deploy and operate the Community Wireless Network as quickly and efficiently as the County can make resources available and provide effective oversight of the MSP's work. This plan will succeed best with the dedicated support of staff from all relevant agencies, including a Deputy Director-level or higher liaison assigned from each, establishing an Interagency Program Management Team working under the guidance of the Steering Committee and managed by the Digital Equity Officer. The requested funding includes an allocation for external resources to serve as subject matter experts and program management support to the Interagency Program Management Team.

### Managed Service Provider

The construction, equipment sourcing, and operation of Community Wireless Networks in this plan relies on a Managed Services Provider (MSP) or multiple MSPs, to be contracted by the County. An MSP will provide all network deployment and operations services, at the direction of the County, working collaboratively on hiring and household adoption services with locally based CBOs in each of the Target Neighborhoods. MSP(s) should be selected based upon the following criteria:

1. Proven expertise in internet service management for organizations at scale, such as housing communities, multiple office environments, and public agencies;
2. Established relationships with vendors and ability to source equipment at favorable prices;
3. Experience installing, operating, and repairing fixed wireless equipment in outdoor settings, with unlicensed 5 GHz and CBRS familiarity a plus;
4. Demonstrated management of field technicians, network engineers, and customer support staff including assets required to maintain a network such as vehicles, tools, and warehouse space;
5. A demonstrated history of highly rated customer interaction;
6. Experience providing services in LA County, with contractor experience to County agencies a plus.

This plan includes a best-value procurement approach of MSP(s) by Target Neighborhood.

This Steering Committee would direct the work of a Digital Equity Officer as overall program lead, working for a Lead Agency.

## Digital Navigators

This plan calls for the County to provide grants to several Community-Based Organizations who can use their organizational capacities to hire several Digital Navigators<sup>17</sup>. A Digital Navigator is essentially a social worker with front-line technical support skills. They can help unconnected residents become confident internet adopters on the network. A few Digital Navigators can make a significant difference in the long-term adoption impact the network will have in Los Angeles County, as evidenced by other successful digital inclusion programs. Some services Digital Navigators will provide include:

- Outreach in Target Neighborhoods about the network's availability;
- Assist residents to establish their eligibility for free service;
- Provide front-line, or "level one," technical support to residents with issues not under the County's or the MSP's purview like router operation;
- Defray costs to the managed services provider by helping residents fix any issues that do not require the assistance of a skilled technician with tools;
- Turn resident adopters into enthusiastic supporters of the network;
- Communicate with residents in their native language if English is not spoken at home, and
- Deepen the skills and knowledge of the network within the target communities.

## Private and Nonprofit Partnerships

This plan creates space for multiple other private partnerships, including with:

1. Private landlords and business owners interested in dedicating real estate to distribution sites or making apartment buildings available for deployments;
2. Community-Based Organizations interested in resident outreach and providing digital navigation services, including hiring Digital Navigators;
3. Vendors interested in deploying equipment in these Community Wireless Networks for field testing.
4. Utilities and other Priority Access License (PAL) holders of the relevant spectrum in LA County that could collaborate with the County to share use of this spectrum to improve network performance.

A few Digital Navigators can make a significant difference in the long-term adoption impact the network will have in Los Angeles County, as evidenced by other successful digital inclusion programs.

17. [National Digital Inclusion Alliance](#)

# Evaluating Alternatives

The Board requested that ISD evaluate alternative methods to close the digital divide. This plan focuses on the recommended approach to achieve the Board's goals, developed in the context of three strategic, high-level alternatives to connect low-income LA County residents:

- 1. Utilize and expand subsidy programs** that would enable LA County residents to use existing broadband networks in the county affordably;
- 2. Deploy Community Wireless Networks** as detailed in this plan; and
- 3. Develop new Fiber-to-the-Home (FTTH) networks** to provide “future-proof” connectivity to residents.

**Each option carries its advantages and disadvantages with respect to cost, longevity, quality of delivery to LA County residents, and opportunity as an investment for the County:**

#### **Subsidy programs:**

Existing subsidy programs could be deployed at \$30-\$50 per month with funding from the County and other sources to connect the 365,000 LA County households that do not have internet. However, the existing programs lack sufficient coverage to fully close the digital divide, and as noted by the CETF study in March 2021, most non-adopters in California consider broadband to be too expensive – even with the presence of subsidy programs. Existing subsidy programs are also unlikely to serve the County's substantial population of undocumented residents.

#### **Community Wireless Networks:**

The option detailed in this plan, building Community Wireless Networks, has the advantage of directly delivering service under the County's oversight while maximizing the potential for partnerships in the communities most affected by the digital divide. It can be deployed rapidly and begin connecting households within weeks of MSP contract approval. This rapid connectivity makes it a strong option for the County to close the digital divide, especially as a pilot program with the opportunity for future growth.

#### **Fiber-to-the-Home:**

By comparison, fiber installation to the premises may cost \$2,000 to \$4,000 per household<sup>18</sup>. The low estimate assumes the most advantageous conditions in the right of way, such as the ability of the provider to use an existing attachment on utility poles<sup>19</sup> and a high density of homes per mile of street. The high estimate assumes the least advantageous conditions—such as a need to build new conduit underground, inability to use lower-cost techniques such as micro trenching, and a relatively low density of homes per mile of street. This would require further study and cost billions over a decade to achieve.

Moreover, this plan for Community Wireless Networks that provide free service to eligible LA County households should be considered as a valuable, viable approach to addressing the digital divide, with significant benefits that can be delivered quickly, and as a plan that can build the County's institutional capacity for initiatives that stretch well beyond this specific program. Indeed, this plan is designed to open more doors for the County without precluding the selection of additional, complementary approaches to addressing the digital divide.

18. Estimate for an urban area, which ranges widely depending on the details of the service area, the scale of the construction, and the ability of the network builder to make use of utility poles and existing structures.

19. This would be the case, for example, if the incumbent phone or cable provider constructed the fiber network starting with its existing infrastructure. Another low-cost approach would be to install the fiber in the power space of the utility pole, which can only be done with the approval of the power company.



A high-level assessment of these alternatives for connecting approximately 365,000 households – the total number of unconnected households in LA County<sup>20</sup> – according to a range of assessment criteria may be considered as follows with consideration to Capital Expenditure (capex), Operating Expenditure (opex), and the expected results of each alternative:

20. 2019 U.S. Census Bureau

### Three paths to free broadband for 365,000 eligible Los Angeles County households

	Subsidy program	Community Wireless Network	Fiber to the Home
<b>Total Capital Investment</b> (over 10 years)	\$0	\$600 million*	Billions of dollars**
<b>Total Operating Costs</b> (over 10 years)	\$1.315 billion	\$800 million*	\$400 million or less**
<b>Total cost</b> (over 10 years)	\$1.315 billion	\$1.4 billion*	Billions of dollars**
<b>Deployment Timeframe</b>	1-3 years	2-10 years	10 years
<b>Result for LA County operations</b>	<ul style="list-style-type: none"> <li>• Little change in operations because ISPs are responsible for services</li> </ul>	<ul style="list-style-type: none"> <li>• Control of rapid deployment to households in need; potential service improvements over time</li> <li>• Potentially better internet to County sites</li> </ul>	<ul style="list-style-type: none"> <li>• Future-resilient internet to County buildings and any household connected to fiber</li> </ul>
<b>County residents' experience</b>	<ul style="list-style-type: none"> <li>• Qualifying for ISP's lowest service rates</li> <li>• Waiting on ISPs to build or provide affordable service</li> <li>• Incomplete coverage of costs to subscribers</li> </ul>	<ul style="list-style-type: none"> <li>• Free reliable service at home</li> <li>• Technical support from Digital Navigators</li> <li>• Quick deployment if available in their area</li> </ul>	<ul style="list-style-type: none"> <li>• Fastest and most reliable internet</li> <li>• Deployment could take years depending on construction and funding capacity</li> </ul>
<b>Speeds</b>	<ul style="list-style-type: none"> <li>• Target 25 Mbps down/3 Mbps up and better</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum 25 Mbps down/3 Mbps up</li> <li>• Potential to improve over time</li> </ul>	<ul style="list-style-type: none"> <li>• 1 Gbps / 1 Gbps</li> <li>• Faster in the future with minimal capital expenditure</li> </ul>
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Low-income county residents connected quickly</li> </ul>	<ul style="list-style-type: none"> <li>• Low-income county residents connected quickly</li> <li>• Consistent experience for households</li> <li>• County controls the footprint and quality of service of its networks</li> <li>• Opportunities for internet cost savings for LA County</li> </ul>	<ul style="list-style-type: none"> <li>• Long-term investment necessary for future-resilient speeds, 5G and beyond</li> <li>• Lower operating costs compared to alternatives</li> </ul>

\* Figures are estimates that require refining;

\*\* An accurate estimate of the cost of FTTH requires a full study of the assets and stakeholders in a region, such that a rough estimate could be misleading; in LA County it would confidently be a several billion-dollar capital project with likely lower operating costs than a wireless network at scale.

# Initial Actions

Should the Board adopt or amend this plan and allocate necessary funding, implementation would include the following essential actions:

- 1. Establish a functional assignment for a Digital Equity Officer** to take full responsibility of the success of the Community Wireless program and establish the Steering Committee and Interagency Program Management Team.  
**Timeline: Q4 2021**
- 2. Contract the Managed Services Provider** that will design, construct, and maintain all aspects of the network's functional operations.  
**Timeline: Q4 2021**
- 3. Build the first Distribution Sites in each of the four Target Areas** to remove the final barrier to household connectivity. **Timeline: Q1 2022**
- 4. Connect the first households to the network**, delivering internet through County connections at minimum 25/3Mbps speeds.  
**Timeline: Q1 2022 – Q2 2022**
- 5. Fund Community-Based Organizations to hire Digital Navigators** who will support new internet adopters, spread awareness of the County's program, and provide front-line technical support.  
**Timeline: Q1 2022 – Q2 2022**
- 6. Scale the program to approximately 50 distribution sites and 12,500 households.**  
**Timeline: Q4 2023**

Each quarter will conclude with a status report, overseen by the Digital Equity Officer, that will communicate vital statistics about the network including how many households are connected, how many network distribution sites support the network, the total amount of bandwidth delivered through the network, and expansion plans to target the next eligible areas of LA County.

Each quarter will conclude with a status report, overseen by the Digital Equity Officer, that will communicate vital statistics about the network.



# **FREE BROADBAND** FOR THE RESIDENTS OF THE COUNTY OF LOS ANGELES:

**An action plan for community wireless networks to build digital equity**

**PREPARED FOR:**



**INTERNAL SERVICES  
DEPARTMENT**  
COUNTY OF LOS ANGELES

**PREPARED BY:**



**Broadband Equity Partnership**



**ctc technology & energy**  
engineering & business consulting