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INTERNATIONAL

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Subject: WRCOG Smart Streetlights: Broadband Assessment

Michael Baker is assisting the Western Riverside Council of Governments (WRCOG) in developing a Smart Streetlight Implementation Plan. As part of this effort, one of WRCOG's member agencies has requested that WRCOG evaluate the potential for additional efforts to encourage the development of a Broadband network serving both residences, businesses and government facilities. Michael Baker has reviewed previous and ongoing efforts to deploy Broadband throughout Riverside County, and has identified other examples of regional Broadband efforts that WRCOG could potentially emulate. This technical memorandum summarizes the findings from that review.

Regional Efforts

RIVCO Connect

RIVCOConnect is a County initiative to address digital inequity by providing access to technology and high speed broadband internet in the region. One of the goals of the program is to bring affordable, high speed broadband network countywide and provide service to all residents regardless of economic status of geographic location.

The program was initiated in 2015 and lead to the development of a communications master plan in 2016 that set the course for implementation of regional broadband in the County. In 2017, Riverside County released a Request for Participants to deploy advanced broadband systems throughout the County. The request described a goal of providing a fiber wherever possible, and applying alternative technologies where fiber is not possible, providing all residents and businesses with access to high-quality internet and bridging the digital divide.

According to the April 2, 2018 WRCOG Board of Directors Regular Meeting Minutes, the request received eight responses. However, Internet Service Providers were not willing to enter partnerships at the local level without public funding. The County therefore decided to leverage available assets to advocate for providers to build a county-wide broadband network.[1]

WRCOG and Michael Baker met with Tom Mullen from RivCoConnect to discuss the details of the RivCO Connect efforts. Based on the interview with Tom Mullen, RIVCOConnect has focused from providing broadband internet service to County residents to advocating and developing programs that connect residents with services providers who offer affordable high speed broadband internet in the region. Providing assistance to the development community and local agencies on permitting for the

[1] https://wrcog.us/AgendaCenter/ViewFile/ArchivedMinutes/_04022018-128

construction and installation of broadband infrastructure is one of the ways the County can help move the needle in the implementation of this vision as well.

Through the research conducted RIVCOConnect has determined that the digital divide may be greater than presented. This is due to the coverage versus service issue. Internet service providers provide broad maps that illustrate coverage areas at a very high level. These maps fail to show the small gaps in the gross service areas. While service may be provided, it may not be accessible to the end user for serval reason. One is cost and another is connectivity to their homes. Until more information is provided by the service providers on who is connected to their systems, it will not be totally clear how well areas are connected. Hence the need to ensure affordable, connected services that reach all residents of the County – regardless of geography or economic status.

Inland Empire Broadband Consortium (IERBC)

The Inland Empire Regional Broadband Consortium (IERBC) was formed in 2012 is a non profit 501(c)(3) that addresses broadband technology access, planning, service reliability, affordability, infrastructure requirements and deployment, and needs within both San Bernardino and Riverside Counties. The program is funded through the California Public Utilities Commission (CPUC) in order to facilitate collaborative planning and to advance the common goals of closing the digital divide by improving access to affordable and reliable high speed broadband internet access in the Inland Empire.

WRCOG is an active member of the IERBC along with a diverse list of 34 additional stakeholders. The Counties of Riverside and San Bernardino, local cities, California State University San Bernardino, school districts, service providers, consultants, and smart cities advocates are all involved in the consortium, which provides for a diverse and well balanced team of dedicated professionals committed to advancing technology in the region.

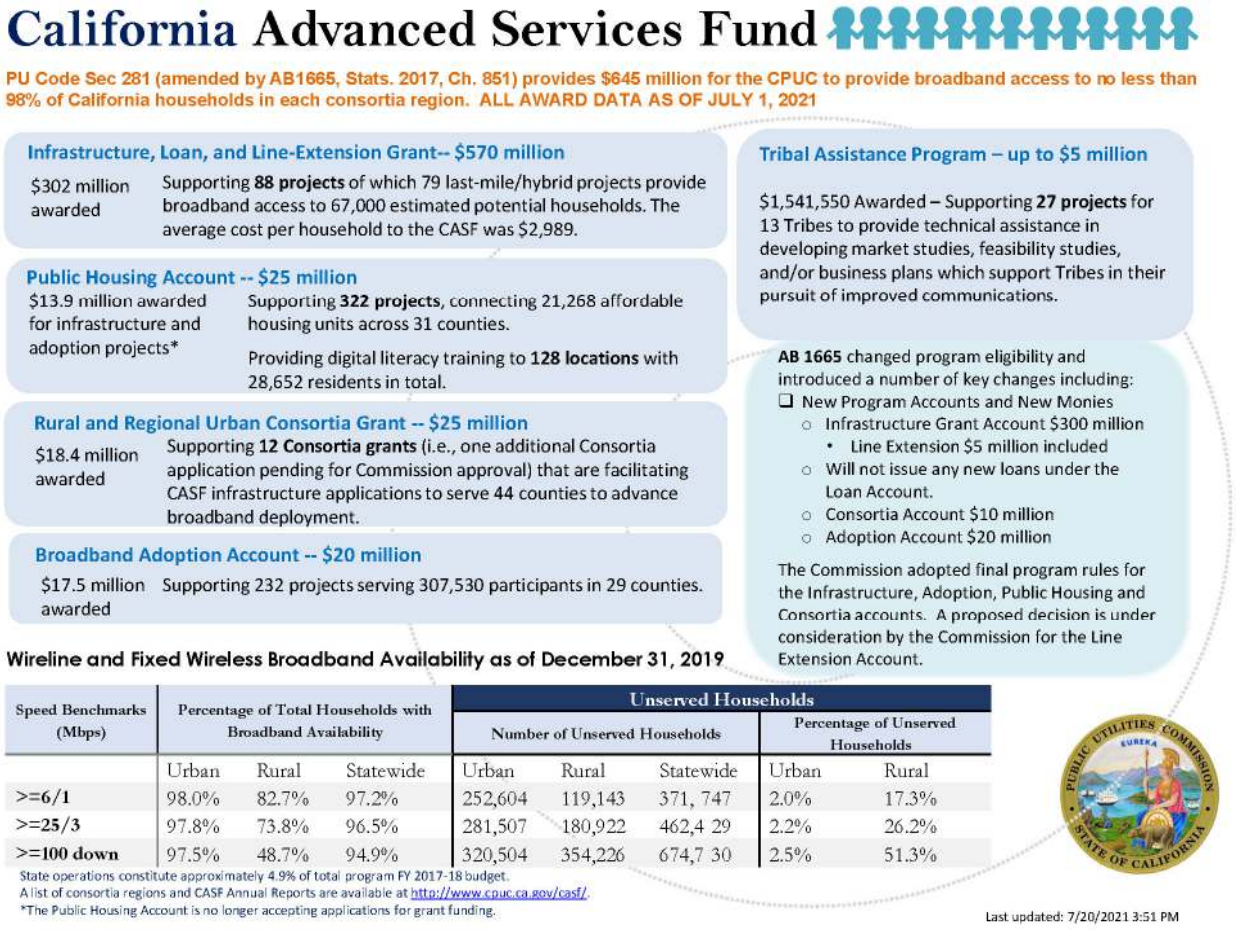
The IERBC has actively advanced access to broadband in two key ways:

- ✓ Development of the Inland Empire Broadband Infrastructure and Access Plan (2014)
- ✓ Identification of and assistance with grant funding for the implementation of broadband programs

The Inland Empire Broadband Infrastructure and Access Plan focused on identifying the need in the region and in highlighting successes and advancements in promoting Smart Region policies and programs, including access to high speed broadband internet.

Grant funding is available for broadband deployment through the CPUC California Advanced Services Fund (CASF). CPUC developed the CASF program in 2007 to support projects that provided broadband services in areas currently without broadband access in underserved areas. Since it's inception over $645 million in grant funds have been awarded across five categories focused on infrastructure, public housing, rural and regional consortia grants, broadband adoption and tribal assistance. With assistance

from IERBC, Over $55 million in grant funding has been awarded to San Bernadino and Riverside Counties, which has reached over 17,000 underserved households in the region. This includes Anza Electrical Cooperative "Connect Anza) Phase 1 and 2, Charter Communications in Country Squire Mobile Home Estates in Moreno Valley, and Charter Communications (Spectrum) for the Soboba Springs Mobile Estates in San Jacinto within Riverside county.



California Advanced Services Fund

PU Code Sec 281 (amended by AB1665, Stats. 2017, Ch. 851) provides $645 million for the CPUC to provide broadband access to no less than 98% of California households in each consortia region. ALL AWARD DATA AS OF JULY 1, 2021

Infrastructure, Loan, and Line-Extension Grant-- $570 million

$302 million awarded — Supporting **88 projects** of which 79 last-mile/hybrid projects provide broadband access to 67,000 estimated potential households. The average cost per household to the CASF was $2,989.

Public Housing Account -- $25 million

$13.9 million awarded for infrastructure and adoption projects* — Supporting **322 projects**, connecting 21,268 affordable housing units across 31 counties.

Providing digital literacy training to **128 locations** with 28,652 residents in total.

Rural and Regional Urban Consortia Grant -- $25 million

$18.4 million awarded — Supporting **12 Consortia grants** (i.e., one additional Consortia application pending for Commission approval) that are facilitating CASF infrastructure applications to serve 44 counties to advance broadband deployment.

Broadband Adoption Account -- $20 million

$17.5 million awarded — Supporting 232 projects serving 307,530 participants in 29 counties.

Tribal Assistance Program – up to $5 million

$1,541,550 Awarded – Supporting **27 projects** for 13 Tribes to provide technical assistance in developing market studies, feasibility studies, and/or business plans which support Tribes in their pursuit of improved communications.

AB 1665 changed program eligibility and introduced a number of key changes including:

- ❑ New Program Accounts and New Monies
  - ○ Infrastructure Grant Account $300 million
    - • Line Extension $5 million included
  - ○ Will not issue any new loans under the Loan Account.
  - ○ Consortia Account $10 million
  - ○ Adoption Account $20 million

The Commission adopted final program rules for the Infrastructure, Adoption, Public Housing and Consortia accounts. A proposed decision is under consideration by the Commission for the Line Extension Account.

Wireline and Fixed Wireless Broadband Availability as of December 31, 2019

Speed Benchmarks (Mbps)	Percentage of Total Households with Broadband Availability			Unserved Households				
				Number of Unserved Households			Percentage of Unserved Households	
	Urban	Rural	Statewide	Urban	Rural	Statewide	Urban	Rural
>=6/1	98.0%	82.7%	97.2%	252,604	119,143	371, 747	2.0%	17.3%
>=25/3	97.8%	73.8%	96.5%	281,507	180,922	462,4 29	2.2%	26.2%
>=100 down	97.5%	48.7%	94.9%	320,504	354,226	674,7 30	2.5%	51.3%

State operations constitute approximately 4.9% of total program FY 2017-18 budget.
A list of consortia regions and CASF Annual Reports are available at http://www.cpuc.ca.gov/casf/.
*The Public Housing Account is no longer accepting applications for grant funding.

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Source: California Public Utilities Commission California Advanced Services Fund (CASF) website: https://www.cpuc.ca.gov/casf/

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Implementation Research and Interviews

Online research was conducted to identify agencies that have successfully implemented programs that advanced broadband installation in their communities. Three agencies were selected based on this research for one on one interview. The three agencies selected include: City of Loma Linda, City of Rancho Cucamonga and South Bay Cities Council of Government. Details of the research on these agencies and the results of the one on one interviews are provided in this section.

Loma Linda Connected Community

The City of Loma Linda is located in San Bernardino County and is home to Loma Linda University and Medical Center. Known for its neonatal intensive care unit, cancer research and treatment, and transplant center, the Loma Linda Medical Center is one of the largest research hospitals in Southern California and is a critical part of the economic fabric of the City.

Through the interview with City staff it was determined that Loma Linda was in an internet void: AT&T did not come into the City with its broadband service, but provided service around the City. While Verizon was rolling out their Verizon FiOs in the region, they would not bring the FiOs into Loma Linda due to AT&T presence around the City. As a result, the City began investigating building a self-reliant fiber network (ultimately a cloverleaf design with four redundant loops) in the City that would connect all municipal and safety building together. These rings would then have spare or dark fibers that could be leased by internet service providers to connect residences and businesses to the fiber optic network.

The Loma Linda Connected Communities program was initiated in 2002 and as of 2021 Phase 1 Network Operations Center and preliminary fiber backbone was substantially complete. The Phase Two fiber backbone will encircle the south-east quadrant of the City. Phases Three and Four will feed the north-west and south-west quadrants respectively. The precise timing of the deployment of the three remaining rings will be primarily determined by the interest level of the residents and businesses in those areas.

Loma Linda was successful in their deployment of citywide broadband through a cooperative agreement between the City and private development. All new commercial and residential development is now required to include fiber optics interface and cabling, and redevelopment involving more than 50% of the structure is held to the same requirement. Dig once policies and modifications to the City building code ensure that the infrastructure is placed in the ground when other public utilities are repaired or installed and in place when buildings are constructed or largely remodeled. These policies and the implementation of the citywide network put Loma Linda on the map as a model for future deployment of citywide high speed broadband internet.

Rancho Cucamonga Municipal Broadband

In 2016 City of Rancho Cucamonga worked with a developer to resolve a fiber connectivity issue. The developer wanted to bring high speed internet to a building they owned, but the local internet service provided wanted over $30,000 for the installation of the fiber to the building. The City had fiber optic cabling and conduit throughout the City, with spare strands of fiber available. The City saw this issue as an economic opportunity to lease the dark fiber to fill the gaps in the communications system.

Recognizing the opportunity, the City prepared a Fiber Master Plan that provided a roadmap for providing citywide fiber optic broadband internet. Rancho Fiber is currently being offered to new developments where the fiber optic infrastructure has been installed during construction. As Phase 1 of the Fiber Optic Master Plan progresses, the City will be utilizing its existing 70 miles of fiber optic cable

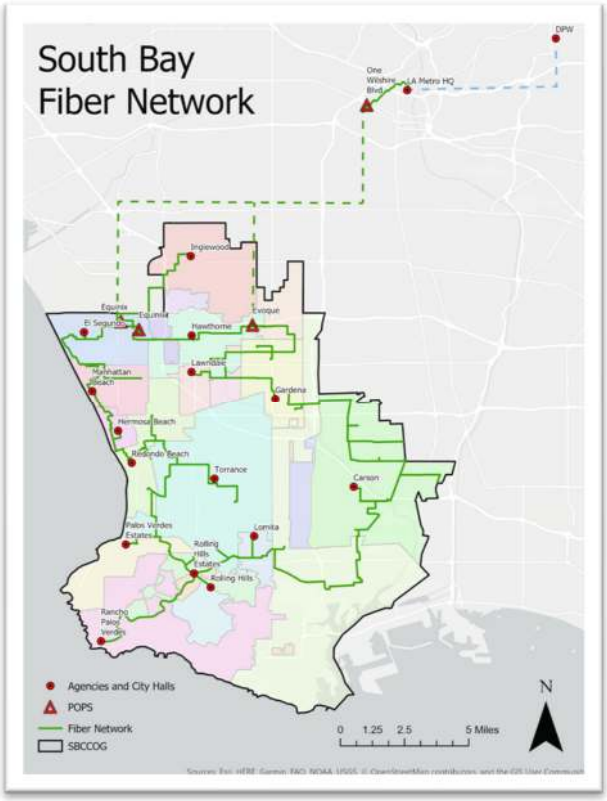
and/or associated conduits to fill network gaps where more business commercial areas and existing residential areas may be added.

The City is currently partnering with Onward for their internet service. Onward leases dark fiber from the City and provides high speed broadband internet service to both residential and commercial uses in the City. The City is responsible for maintaining and constructing the physical infrastructure in the City. The system is managed and maintained by the City's utility department.

South Bay Fiber Network

The need for high speed broadband internet service began as an economic development issue when a large employer in the City of Torrance left for another state because of the lack of high speed, reliable internet service. The South Bay Workforce Investment Board and one of the Los Angeles County Supervisors provided seed funds to assess the issue in 2017 and the region prepared the South Bay Broadband Master Plan. The plan outlined the need for a high-speed capacity broadband network that would allow the South Bay cities to embrace the digital economy, smart city initiatives, integrated utilities and next-generation economic development. Planning for these initiatives was a necessity to remain competitive and differentiate the South Bay as a technology-savvy place to live, work, play and learn. The master plan provided a detailed blueprint for broadband and technology infrastructure to keep the South Bay at the forefront of the digital economy.

As of August 2020, South Bay Cities Council of Governments (SBCCG) has an operational Municipal Giga Byte Network call the South Bay Fiber Network (SBFN), which has connected 15 cities and 37 municipal sites. To fund the project, the South Bay Cities submitted a funding request for $4.4 billion in Measure M (transportation tax) funds in September 2019. Because officials were asking for transportation funding, the project leaders needed to establish a transportation component. South Bay officials and the Metro (Transportation Authority) agreed to connect the fiber-optic ring to traffic collection centers and traffic monitoring programs operated by the Metro, Los Angeles County, Manhattan Beach, and Torrance.



The cities later received an additional $2.5 million in additional Measure M funding, as well as $1.2 million from the state. The network includes series of fiber optic rings that allows for redundancy and reduces potential down time. Each of the member agencies have at least one site connected to the fiber optic ring. To date a total of 37 municipal site are connected, which includes connectivity to Metro stations, West Basin Water District, Beach Cities Health District, Lundquist BioMedical Insititute, South Bay Workforce Investment Board (7 locations), and Los Angeles County Department of Public Works.

SBCCOG leases the dark fiber on the network to an outside vendor (American Dark Fiber). American Dark Fiber maintains the fiber optic network and contracts with an internet service provider (Race Communications) that provides internet to the cities and the public. Monthly recurring costs for service and/or transport circuits are covered by the respective agency.

Additional On-Line Research

According to Connect California, there are 17 municipal agencies that provide broadband in the state of California as of January 2022. Facts provided by Connect California:

- ✓ There are 332 total municipal broadband networks in the US, with only 63 of those offering Fiber to the Home internet service for residential use.
- ✓ The majority of municipal broadband networks in California are based in dark fiber owned by the city. Only 2 of the 17 municipal providers in California are utility co-ops: Connect Anza, and Plumas-Sierra Telecommunications.
- ✓ Only 6 of the 17 municipal broadband providers in California offer residential services, with 3 offering FTTH (Fiber to the Home) service in the last mile. The rest focus on enterprise and business services, or are exclusive to municipal services and anchor institutions like hospitals, libraries, and schools.

The box to the right is a list of agencies that provide municipal broadband services to residential and/or business partners. The following is a summary of a select group of agencies where information about their program was availabl

City of Beverly Hills

Fiber to the Premise program began in 2014 and aimed to provide broadband services to residents and businesses throughout the City. The program will provide one Gigabit-per second internet speeds to residents for about $50 per month. Voice and video services (phone and television) will also be available as add-on services. As of 2020, the City was in the process of installing fiber optic cabling citywide and is anticipated to roll out services in 2022.

California Municipal Broadband Providers:

- ✓ Beverly Hills (late 2022)
- ✓ Burbank Water and Power
- ✓ City of Anaheim
- ✓ City of Shafter
- ✓ Connect Anza
- ✓ Culver Connect
- ✓ Loma Linda Connected Community
- ✓ City of Long Beach
- ✓ Palo Alto Fiber
- ✓ City of Pasadena
- ✓ Pulmas-Sierra Telecommunications
- ✓ Riverside Dark Fiber Network
- ✓ San Bruno Municipal Cable TV
- ✓ City of Santa Clara
- ✓ Santa Monica City Net
- ✓ Truckee Donner Public Utility
- ✓ Vernon Light & Power

City of Anaheim

Anaheim Public Utilities operates a fiber optics network to control and monitor its water and electric systems and provide connectivity for municipal services. The fiber network has spare capacity that broadband service providers can lease to provide high-speed internet access to their customer in Anaheim.

In addition, major cell phone companies (AT&T, Verizon, and T-Mobile) are working to improve service for their customers in the City. As part of these improvements, they are replacing some of the streetlight poles to allow installing their wireless equipment inside an enclosure at the top. These installations are referred to as Small Cell Sites. To streamline the process, Anaheim Public Utilities has adopted a standard license agreement and wireless-ready streetlight poles.

Culver Connect

Culver Connect is a municipal fiber network facilitating high speed data connectivity to Culver City businesses in order to promote economic development. In 2013 the City began consulting with the Culver City business community about their need for enhanced broadband connectivity. The City then completed a high-level network design and evaluated potential business models. In 2015, the City Council approved funding for the design and construction of a Municipal Fiber Network. Construction of the network was completed in July 2018. Culver City now has a 21.7 mile network backbone in three geographical network rings interconnected by "ring ties" of approximately 3.1 route miles of fiber. The network backbone is comprised of 576 strands of entirely undergrounded fiber. There are three hub facilities located in the city which house city-owned network electronics. The City leases two fiber connections to carrier hotels at One Wilshire in Los Angeles and Equinix (LA3) in El Segundo.

City of Pasadena

The City of Pasadena owns and operates approximately 50 miles of fiber network, which supports City business and transportation operations. Currently the system provides the foundation for a variety of business-oriented services that the City offers currently and plans to expand in the future. For businesses seeking to connect multiple facilities within Pasadena, the City offers either dark fiber leases or lit services between locations within Pasadena. Currently the City does not provide service in residential areas.

Riverside Dark Fiber Network

Riverside Public Utilities offers dark fiber leases on its 120-mile network, which connects office buildings, industrial properties and data centers, and serves 5G-ready sites throughout the city limits. Internet service providers or wireless operators can lease fiber and use it to deliver connectivity to customers, and businesses can use it to create their own wide area enterprise networks. More locations will be added, with the goal of making dark fiber connections available to industrial and commercial customers everywhere in Riverside. The program does not currently include residential service.

Santa Monica CityNet

For more than two decades City of Santa Monica has been constructing a citywide fiber optic network that has connected civic facilities and businesses. In 2015, the City embarked on their Digital Inclusion Pilot Program, which connected ten affordable housing projects to the City's fiber network. Since this pilot program began the City has continued to connect low income, high density residential projects to the fiber network.

Additional Resources:

Rural Oregon projects: https://www.oregon4biz.com/Broadband-Office/Rural-Broadband-Capacity-Program/

Arizona Initiatives (see PDF page 39 for AZ examples and page 40 for other case studies): https://azlibrary.gov/sites/default/files/erate_2018_az_broadbandstrategicplan_final.PDF

https://www.azcommerce.com/broadband/grant-opportunities/

California State Action Plan: https://broadbandcouncil.ca.gov/action-plan/

SCAG resolution and Draft Broadband Policy: https://calcog.org/scag-commits-to-broadband-for-underserved/

California Association of Councils of Governments resources: https://calcog.org/broadband-resources/

Summary & Conclusions

If you have any questions pertaining to the findings summarized in this memo, please call Dawn at (760) 603-6266.

Sincerely,

Dawn Wilson,
Department Manager
Transportation Planning