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**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

*Order Instituting Rulemaking Regarding  
Broadband Infrastructure Deployment and  
to Support Service Providers in the State of  
California*

Rulemaking 20-09-001

(Filed 10/15/21)

**REPLY COMMENTS OF THE ELECTRONIC FRONTIER FOUNDATION IN  
RESPONSE TO THE REQUEST FOR ADDITIONAL COMMENTS AS PART OF  
MIDDLE-MILE DATA COLLECTION**

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**I. INTRODUCTION**

In accordance with Rule 6.2 of the California Public Utilities Commission's ("Commission") Rules of Practice and Procedure ("Rules"), the Electronic Frontier Foundation (EFF) submits these comments in response to the request for additional comments as part of middle-mile data collection.

**II. ABOUT THE PARTIES**

The Electronic Frontier Foundation (EFF) is the leading nonprofit organization defending civil liberties in the digital world. Founded in 1990, EFF champions user privacy, free expression, and innovation through impact litigation, policy analysis, grassroots activism, and technology development. With over 35,000 dues-paying members (with several thousand California members) and well over 1 million followers on social networks, we focus on promoting policies that benefit both creators and users of technology. EFF has been at the forefront of studying the future of broadband access in the high-speed market and has conducted in-depth research and produced both legal and technical publications on the issue. EFF's goal in broadband access is the deployment of universally available, affordable, and competitive high-speed networks. EFF focuses on fiber because it is the only data transmission medium capable of low latency and speed upgrades for generations to come that far exceed alternative last-mile options and a necessary component for ubiquitous 5G coverage.

### III. DISCUSSION

#### A. The Statute is Clear that the State’s Middle-Mile Infrastructure Program Must Accomplish Three Goals and Assigns a Specific Duty to the Commission

Several commentors<sup>1</sup> repeatedly and incorrectly asserted that the Commission’s role was akin to staff research, with its responsibility extending to producing a written document, then washing its hands of the matter. Commentors are welcomed to revisit the statute’s mandatory language, which reads as follows:

*“The commission **shall identify** statewide open-access middle-mile broadband network locations that will enable last-mile service connections and are in communities where there is no known middle-mile infrastructure that is **open access, with sufficient capacity, and at affordable rates.**”* (emphasis added)

In other words, the Commission is responsible for identifying to the Department of Technology and the “third-party administrator” areas that lack middle-mile infrastructure that meet three conditions: open access, sufficient capacity, and affordable rates. The mere existence of a middle-mile infrastructure alone does not meet the statutory requirements contrary to statements made by industry.<sup>2</sup> It must exist **and** be offered in an open-access manner with sufficient capacity to scale upwards **and** be provisioned at an affordable rate.

EFF has suggested the Commission establish a means for existing providers to validate with the Commission that their middle-mile infrastructure is provisioned in a means prescribed in statute.

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<sup>1</sup> See *CTIA Comments on the Administrative Law Judge’s Email Ruling Ordering Additional Comments on Middle-Mile Data Collection* at 1 (asserting that all that is mandated from the Commission is the production of a report while failing to mention identifying what type of middle mile infrastructure must be identified); See *Opening Comments of AT&T California (U 1001 C) on Email Ruling Ordering Additional Comments as Pat of the Middle-Mile Data Collection* at 1 (asserting that the Commission is merely making a series of recommendations to the Department of Technology).

<sup>2</sup> See *Opening Comments of AT&T California (U 1001 C) on Assigned Commissioner’s Ruling Dated August 6, 2021 Regarding Middle-Mile Broadband Network* (filed September 10, 2020) at 11 (asserting that the “Commission should deem any privately deployed middle-mile facilities to be affordable” without acknowledging the possibility of monopoly status impacting prices charged above competitive rates).

Commentors opposed to the Commission taking a direct regulatory role in making this determination are asking the Commission to simply go on blind faith that existing middle-mile infrastructure already meets the three key conditions. The state can validate whether any existing infrastructure is open access, whether its capacity is sufficient for the future, and that rates are provided in an affordable manner only through some form of data collection and regulatory enforcement. Without a durable enforceable means of ensuring the goals of the law are being met, existing entities enjoying monopoly status in a region will be motivated to overstate their offerings to avoid having to reduce their charges to affordable rates and provide their infrastructure on a truly open-access basis.

Some commentors have argued that the Commission lacks any responsibility under the new law,<sup>3</sup> but while litigation is ongoing on the state's authority over broadband providers, the Commission has been given a direct mandate under the new law to identify existing open-access middle-mile providers that meet the statute's criteria. Therefore, a voluntary process similar to the Eligible Telecommunications Carrier licensing process<sup>4</sup> could address the problem while squarely being within the statutory grant of authority. The Commission should establish a new "Open-Access Middle-Mile Provider" license to allow existing providers to self-certify that their infrastructure meets the 3 statutory conditions. The Commission would then validate self-identifying entities to ensure compliance. This would properly sort out for the Department of Technology what areas are eligible to build.

A licensed Open-Access Middle-Mile Provider will gain the regulatory benefit of not having the state build in their vicinity and thus deprive them of revenues, while the state can prioritize building in fewer areas with limited resources. Refusal to seek a license would send a clear signal to the Commission and the Department of Technology that an existing middle-mile infrastructure is not provided on an open-access basis with sufficient capacity at affordable rates

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<sup>3</sup> See *Comments of the California Cable and Telecommunications Association at 3* (Oct 1, 2021) (asserting that "SB 156 contemplates no role for the Commission in "assuring" open access and affordability requirements because those issues are to be addressed by the Office and TPA").

<sup>4</sup> See *Resolution T-17002. Adopting Comprehensive Procedures and Guidelines for Eligible Telecommunications Carrier Designation and Requirements for Eligible Telecommunications Carriers* (May 25, 2006), available at [https://docs.cpuc.ca.gov/published/FINAL\\_RESOLUTION/56844.htm](https://docs.cpuc.ca.gov/published/FINAL_RESOLUTION/56844.htm).

and is therefore eligible for the state to build. Existing providers cannot have it both ways. They cannot assert that the state does not need to build while simultaneously refusing to provision middle-mile infrastructure in the manner the legislature (on a unanimous basis) has demanded the Commission and Department of Technology deliver to the public.

**B. An Open-Access Middle-Mile Provider License Must Have Objective Criteria Rooted in Well-Known Standards and Provide Long-Term Stability to New Last-Mile Providers**

In order to qualify as an “Open-Access Middle-Mile Provider,” one must provision their infrastructure in a manner established by the Commission that meets the statute’s requirements. The license should apply for at least 30 years in order to provide stability to last mile grantees and loan-loss reserve applicants who will likely need to take on 30-year debt obligations to build fiber infrastructure of their own. This ensures that an incumbent provider with middle-mile infrastructure cannot simply prevent the state from building by temporarily making middle-mile infrastructure available, and then a few years later, withholding access. In order to provide long-term confidence to last-mile investors into unserved and underserved communities, words alone cannot suffice. It must be backed with the power of law. It is the Commission’s responsibility to have a verification process with meaningful enforcement capability in order to meet its responsibility of identifying network locations for the state’s open-access middle-mile network.

EFF suggests that the most straightforward means of defining “open access” is adopting the long-standing (though soon to expire) rules that governed the provisioning of middle-mile dark fiber between Incumbent Local Exchange Carriers (ILECs) and Competitive Local Exchange Carriers (CLECs). Such rules bring with them decades of history and understanding among many industry players. However, the provisioning of infrastructure from one set of industry players to another excludes multiple new entrants and cannot truly be considered “open.” Therefore, EFF suggests that eligible entities who are seeking grants or loans from the Commission should be given the right to purchase dark-fiber middle-mile access at an at-cost basis from an Open-Access Middle-Mile Provider much as CLECs and ILECs have done under the federal and state rules.

The other advantage of adopting the historical method of provisioning dark-fiber middle-mile access between ILECs and CLECs is that it also meets the statutory definition of “affordable rates” when provided at an at-cost basis. Open-Access Middle-Mile Providers could offer lit services at a commercial rate, but these will inevitably be higher than at-cost dark fiber. Rather, to keep the price of last-mile service as low as possible to deliver broadband access, a last-mile provider must be given as much control over their costs as possible.<sup>5</sup> Ownership of dark fiber puts the responsibility of running the infrastructure (as well as the costs) completely in the hands of the last-mile provider.

Lastly, on defining “sufficient capacity” EFF noted that the annual trends of broadband consumption are on the rise as applications and services continue to evolve. Per Cisco’s analysis, North American data consumption will reach 90 exabytes per month by 2022.<sup>6</sup>

Year	North America IP Based Traffic in Exabytes Per Month
2012	14.4
2018	43
2022	90

**Source: Cisco Visual Predictions 2012-2017 and 2017 - 2022**

This persistent growth in consumption means that consumers will continue to seek broadband products that quickly grant access to ever larger amounts of data. When the FCC adopted the 25/3 standard in 2015,<sup>7</sup> monthly data consumption was less than half of what it is projected to

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<sup>5</sup> See *Opening Comments of Sonic Telecom, LCC (U-7002-C) on Additional “Middle-Mile” Issues* at 4 (stating that “without a ubiquitous, reasonably priced, long-lived interoffice dark fiber transport network that can be configured by each CLEC to meet its competitive needs, CLECs would be unable to continue to provide competitive services to Californians, and competition would be gravely injured.”).

<sup>6</sup> *Cisco Visual Networking Index: Forecast and Trends, 2017–2022 White Paper*, Cisco (Feb. 27, 2019), <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-741490.html>.

<sup>7</sup> Micah Singleton, *The FCC has changed the definition of broadband*, THE VERGE (Jan. 29, 2015), <https://www.theverge.com/2015/1/29/7932653/fcc-changed-definition-broadband-25mbps>.

reach in the near future.<sup>8</sup> One expert analyst estimates that Internet consumption will grow at an average of 21% every year, as it has for decades.<sup>9</sup> Therefore, to make its prediction of projected growth in consumption needs, the Commission must assess whether “sufficient capacity” is available. Fiber-optic infrastructure will inevitably be favored simply because it contains future-proof spectrum capacity that cannot be replicated by any other means of delivering data today.<sup>10</sup>

### **C. EFF Agrees with CCTA Regarding Concerns in Delays in Construction Raising Costs and Recommends the Commission Seek Ways to Expedite Permits for State Infrastructure**

The CCTA raised concerns with delays in permitting to deliver access<sup>11</sup> and EFF wholeheartedly agrees with these concerns. The largest cost driver to building new infrastructure (potentially as much as 90 percent of the deployment costs) is the civil works involved.<sup>12</sup> Much of that cost can come from delays where construction crews are effectively paid to not work. The Commission should seek ways to use its regulatory authority to expedite permitting, along with access to poles and conduit for the state’s middle-mile construction projects. The state’s infrastructure project qualifies for special consideration because federal law requires that the funding be spent within a few short years.<sup>13</sup> Expediting construction of the state’s infrastructure is also critical to stimulate last-mile providers to emerge in unserved territories. They cannot

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<sup>8</sup> Cisco *Visual Networking Index: Forecast and Trends, 2017–2022 White Paper* supra note 6.

<sup>9</sup> Doug Dawson, *Why Fiber?*, POTs and PANs (Feb. 1, 2021), available at <https://potsandpansbyccg.com/2021/02/01/why-fiber>.

<sup>10</sup> See Bennett Cyphers, *The Case for Fiber to the Home, Today: Why Fiber is a Superior Medium for 21st Century Broadband*, ELECTRONIC FRONTIER FOUNDATION (Oct 11, 2019), [https://www.eff.org/files/2019/10/15/why\\_fiber\\_is\\_a\\_superior\\_medium\\_for\\_21st\\_century\\_broadband.pdf](https://www.eff.org/files/2019/10/15/why_fiber_is_a_superior_medium_for_21st_century_broadband.pdf) (for a more detailed explanation as to why different transmission mediums have different inherent capacities baked in physics).

<sup>11</sup> See *Comments of the California Cable and Telecommunications Association* at 13 (detailing a list of projects that faced “delays and cost overruns.”).

<sup>12</sup> EUROPEAN COMMISSION, *Analysys Mason: Support for the Preparation of an Impact Assessment to Accompany an EU Initiative on Reducing the Costs of High-Speed Broadband Infrastructure Deployment* at 36, <http://ec.europa.eu/digital-agenda/en/news/support-preparation-impact-assessment-accompany-eu-initiative-reducing-costs-high-speed>; See also INTERNATIONAL TELECOMMUNICATION UNION, *Cost Analysis for Fiber to the Home*, <http://www.ictregulationtoolkit.org/en/toolkit/notes/PracticeNote/2974>.

<sup>13</sup> See *National Association of Counties Frequently Asked Questions* at question 69 (“All funds must be obligated within the statutory period between March 3, 2021 and December 31, 2024 and expended to cover such obligations by December 31, 2026) available at <https://www.naco.org/resources/featured/naco-recovery-fund-faqs>.

come into existence without access to the middle mile, and throughout the statute the legislature has made clear that provisioning access to the unserved is a priority.

#### **D. The Commission Should Avoid Recommending a “Worst First” Strategy as Opposed to a Universal 21<sup>st</sup> Century Access Strategy**

The recommendations that the Commission adopt a “worst first” strategy are misguided and fail to understand how networks operate and—more importantly—become **sustainable**. Communities should be given clear guidance that they must include the unserved in their delivery of network access but not to the exclusion of also connecting their underserved population. The reason? A network needs to aggregate *all* of the demand in order to cross-subsidize the most difficult and expensive places to connect with the underserved and even the served.

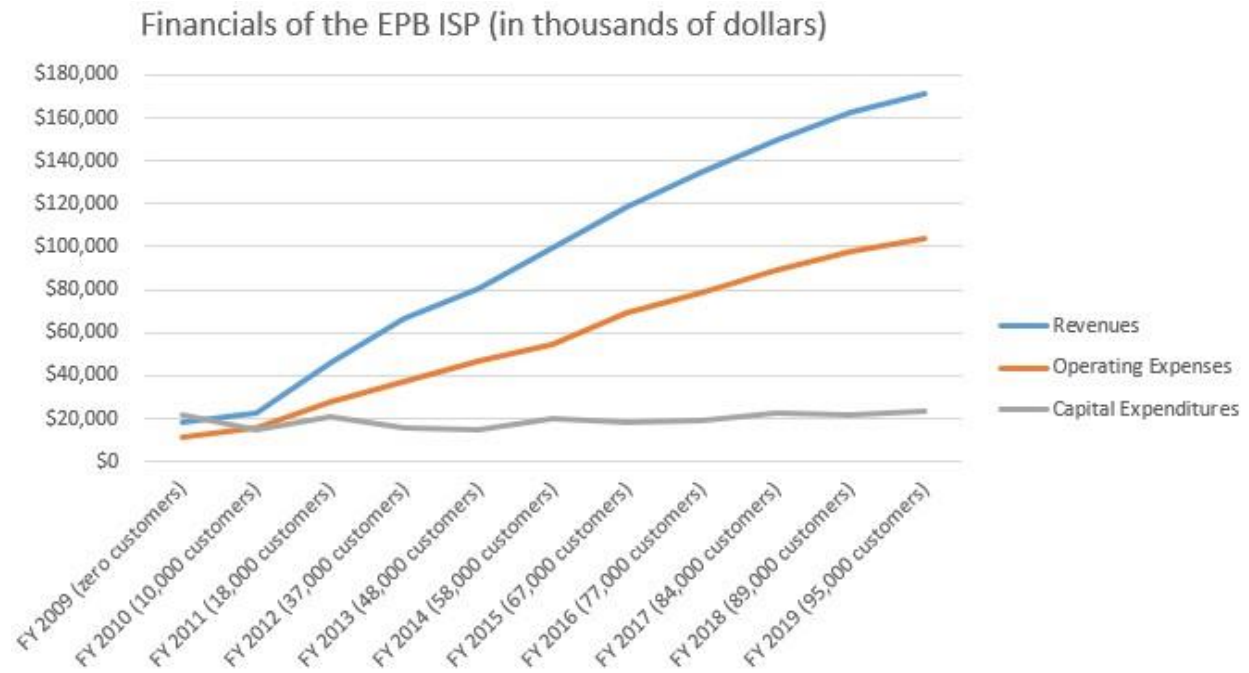
The reality is the world has moved past copper and is now moving past coaxial-based last-mile infrastructure for high-speed needs. Adopting a backwards-looking standard to determine where to build will strand countless communities using decades-old copper infrastructure that the industry is rapidly attempting to abandon.

The question should remain focused on which communities have no pre-existing fiber-optic infrastructure. If a community is already served by a fiber-optic provider, it would be appropriate for the state government to focus its investments elsewhere and rely on open-access regulation to remedy any local problems with accessing the infrastructure.

Lastly, often large private ISPs have cherry-picked the most lucrative portions of rural markets to serve with access at 25/3 Mbps while leaving the rest of the community to languish. New last-mile providers, particularly in rural markets, need to invest in their *entire* community to transition themselves into 21<sup>st</sup>-century fiber. They need the ability to upgrade everyone by cross-subsidizing the costs between their high-end users with higher-cost users. These core tenants, usually anchor institutions or local businesses, can often provide the revenues to make the entire deployment financially feasible on its own.



Take, for example, Chattanooga’s revenues compared to their expenses. Only a fraction of the population was necessary to cover the costs of providing FTTH to the community—revenues outpaced the costs of adding new customers year after year (see chart below). Chattanooga’s public ISP is so revenue-heavy that it could provide *free* 100/100 mbps broadband to 28,000 students for 10 years at an *at-cost basis of barely \$2.50 per month per student*—serving all its low-income families with students attending public school.<sup>14</sup> Such generosity is only doable by universal deployment of fiber throughout an entire community and the ability to cross-subsidize amongst users, not microtargeting unserved pockets.



<sup>14</sup> Taelor Bentley, *Hamilton County Schools and EPB Team Up to Provide Internet Access to Students*, AMERICAN PUBLIC POWER ASSOCIATION (Aug. 17, 2020), available at <https://www.publicpower.org/periodical/article/hamilton-county-schools-and-epb-team-provide-internet-access-students>; *See also* Press Release, ELECTRIC POWER BOARD OF CHATTANOOGA, *State of Tennessee Helps Bridge Digital Divide for Students in Chattanooga and Hamilton County* (Sep. 30, 2020), available at <https://epb.com/about/news/state-of-tennessee-helps-bridge-digital-divide-for-students-in-chattanooga-and-hamilton-county>.

## E. The Commission Should Consider the Impact Last-Mile Open-Access Fiber Can Have on Communities

One of the most potentially revolutionary changes in telecom policy today is the growth of an industry that does not directly sell broadband access but rather treats fiber as an infrastructure — and connecting homes and business with an open-access approach. California’s own Facebook is now investing heavily in this industry in Africa<sup>15</sup> and South America<sup>16</sup>, and is opening up its own fiber networks in the United States.<sup>17</sup>

EFF believes that *open-access last-mile* delivery of fiber infrastructure is the path to universal fiber access, given that multiple entities need high-capacity infrastructure but cannot all independently deploy their own fiber. Particularly in rural markets, it may be possible to sustain only one fiber-optic network with local revenues, making a second overlapping fiber network financially risky both to the new entrant and the existing provider.

Rural markets are uniquely difficult to serve, as spread-out populations make it difficult to recover the costs of building the infrastructure to connect all residents. However, new approaches to connecting those markets — namely through supporting the construction of one fiber network that can aggregate demand from anchor institutions and retail broadband providers under an open-access regime — is proving fruitful. One study even suggests that it is feasible that rural markets can be connected to fiber for *zero subsidies*, if long-term, low-interest loans are offered and the fiber is treated as an infrastructure project.<sup>18</sup>

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<sup>15</sup> Prince Osuagwu, *MainOne Partners Facebook on Open-Access Fiber Network in Nigeria*, VANGUARD, Feb. 27, 2019, available at <https://www.vanguardngr.com/2019/02/mainone-partners-facebook-on-open-access-fiber-network-in-nigeria>.

<sup>16</sup> Frederic Lardinois, *Facebook Expands Its Internet Infrastructure Projects*, TECHCRUNCH, Feb. 2019, available at <https://techcrunch.com/2019/02/25/facebook-expands-its-internet-infrastructure-projects>.

<sup>17</sup> Mitch Wagner, *Carriers Shouldn’t Panic About Facebook’s Wholesale Fiber Service – Yet*, LIGHTREADING, Mar. 18, 2019, available at <https://www.lightreading.com/optical-ip/carriers-shouldnt-panic-about-facebooks-wholesale-fiber-service---yet/d/d-id/750213>.

<sup>18</sup> DIFFRACTION ANALYSIS, *Structural Remedies to Solve the Rural Broadband Issue*, available at <https://www.diffractionanalysis.com/services/white-papers/2016/06/structural-remedies-solve-rural-broadband-issue>.

Such approaches are being used in countries like Ireland<sup>19</sup> and New Zealand<sup>20</sup> as well as many EU member states. EFF further believes the Commission should consider how last-mile open-access fiber deployment could resolve digital redlining as well. Our initial analysis in the digital redlining proceeding predicted that any carrier can profitably deploy fiber to the home to communities with population density exceeding 1,000 people per square mile. This estimate is fairly conservative and the likely true number is much lower if the deployment reaches enough users to aggregate demand. For example, EFF believes Los Angeles County is ripe for universal open-access fiber deployment prioritizing the more than half of the community that lacks gigabit fiber connectivity. As EFF studies this issue further, we will endeavor to produce more data for the Commission to consider as it designs its grant and loan-loss reserve programs in the coming months.

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<sup>19</sup> Press Release, Over 300,000 homes in Northern Ireland Now Enjoying the Benefits of Fibre Broadband, BT Regions, available at <http://www.mynewsdesk.com/uk/btregions/pressreleases/over-300000-homes-in-northern-ireland-now-enjoying-the-benefits-of-fibre-broadband-2337783>.

<sup>20</sup> COLUMBIA TELECOMMUNICATIONS CORPORATION, The New Zealand Ultrafast Broadband Network: Flexible, Cost-Effective Open Access, available at <http://www.ctcnet.us/NewZealandUltrafastNetwork.pdf>.