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 August 6, 2021)

REPLY COMMENTS OF THE CALIFORNIA BROADBAND COOPERATIVE, INC.

I. Introduction

The California Broadband Cooperative ("CBC" or "Cooperative") files these Reply Comments in response to questions posed in the E-MAIL RULING ORDERING ADDITIONAL COMMENTS AS PART OF MIDDLE-MILE DATA COLLECTION issued by Thomas Glegola, the Administrative Law Judge, in this proceeding on September 9, 2021. ("E-mail Ruling")

The E-Mail Ruling begins the Commission's inquiry into issues relating to how middle-mile broadband can achieve the two purposes is SB 156: (1) creating a state middle-mile network ("Golden State Middle-Mile Network") and (2) enabling Counties to reach geographic pockets where broadband is unavailable or insufficient.

Broadly speaking, SB 156 should result in a platforms enabling affordable broadband in unserved or underserved communities and a middle-mile platform that enhances competitive options. CBC does the latter. CBC would like to be able to help serve unserved and underserved communities in its rural service area so that residences and businesses can take advantage of the opportunities that broadband facilitates.

As demonstrated by CBC's Opening Comments filed earlier in this proceeding, CBC's experience offers a blueprint for the creation and operation of a public benefit, open-access

middle-mile network.[1] As a result of federal and state subsidies, the Cooperative's network was constructed and is operated to commercial standards. It is reliable, hardened and scalable. It is a tool to deliver essential services related to education and healthcare in a region that could not afford middle-mile investment but for government subsidy. It promotes economic development and sustainable rural communities.

The middle-mile services offered by the Cooperative enable broadband access in most of the Digital 395 service area. However, middle-mile broadband alone does not guarantee affordable broadband end-use access. Further focused investment by the state to standards articulated in these comments could extend the reach of the Cooperative's middle-mile plant and enable the Cooperative to help traditional ISPs and CBC's County Cooperative members provide affordable dynamic broadband in unserved and underserved communities.

II. How can the Commission use its regulatory authority to assure durable and enforceable open-access and affordability requirements in perpetuity?

a. Open Access Requirement

The Commission should adopt the Broadband Technology Opportunities Program ("BTOP") Open access policy and definitions and require service providers to demonstrate compliance annually through sales activities and ISP outreach filings. These are the requirements with which CBC must comply. They ensure that CBC must operate as an open-access network as a matter of law.

b. Affordability

In order to ensure that open access middle-mile operators in the state, including CBC and the Golden State Middle Mile network, can sustainably offer affordable service to last mile providers and anchor institutions, the Commission must align federal and state subsidy policy, by taking care to ensure that both the construction and operation of these networks is assured.

For example, the Commission should factor into its subsidy model the important contribution of Universal Service Administration Corporation ("USAC") and the Commission's

[1] See CBC Opening Comments filed 09/03/21.

subsidized programs, including the California Teleconnect Fund ("CTF"), to rural carriers. The USAC subsidy is provided to schools, hospitals, and libraries. This has the consequence of making CBC's services affordable, although there is no doubt that additional subsidies to anchor institutions would broaden the services available to those institutions and enhance the role of broadband as a tool in achieving their missions. In many of those areas, the USAC services function as the anchor tenant that enables a rural carrier to support service into an area for all the residents. Moreover, federal subsidy through USAC creates recurring revenue for CBC. Thus, the Commission should take care to ensure that CBC does not lose USAC or CETF revenues so that its business model can remain viable and it can continue to provide essential services to anchor institutions.

III. Should the Commission adopt a tariffing requirement for open-access networks?

Imposition of a tariff requirement on CBC, which is required to provide competitive open access services, is unnecessarily burdensome given its continuing obligation under the BTOP grant.

IV. What specific locations, routes, interconnection points, regeneration points, and tie-ins should the Commission consider to increase the attractiveness and usefulness of the statewide open-access middle-mile broadband network for commercial internet service providers?

The Golden State Middle Mile Network should focus on creating new middle-mile network infrastructure that results in affordable broadband in unserved and underserved communities.

In the geographic areas served by CBC, the State should partner with CBC by leasing services from the Cooperative in a manner that does not undermine the investments that the federal government and the State of California have made in CBC.[2] In addition, the Commission should use the mandate in SB 156 to subsidize middle-mile facilities into areas adjacent to the

[2] See Comments by Mono County filed 08/06/21.

Cooperative's current service area so that CBC can extend its mission. Funding CBC to incrementally extend its geographic service area is consistent with the Legislature's intention.

V. How can existing interconnection points or the creation of new interconnection points improve access for Communities?

During the planning stage of the Digital 395 project, CBC conducted extensive research into the potential subscriber location, fiber cable sizing and interconnection points along the Digital 395 route. As a result, CBC offers fiber interconnection and colocation services for ISP customer services at nearly any point on the Digital 395 network. However, some special construction costs are unavoidable when adding new interconnection points. Thus, CASF funding would help CBC afford for additional interconnect points on its existing open access networks. This would remove a barrier to entry for a service provider.

More recently, CBC has undertaken an effort to drive fiber access deeper into the network and to reach small tribal lands and rural communities, which may have as few as customer clusters 5 to 25 households. In Mono and Inyo counties, approximately 22 "hamlets" and 7 tribal communities still need to be connected. Many of these will require laterals to get to them because they are off the main backbone and about four of the communities are in the eastern part of Inyo County by Death Valley. CBC has estimated we have about 65 miles of laterals to reach most of these communities, and there is an extensive build-out for the Eastern Inyo County area. CBC will need about $35M to upgrade its middle-mile plant to facilitate access to over 1250 residents in these communities.

Additional subsidies would make construction and operation of such facilities more affordable both for CBC, its members and, in theory, end-users in unserved and underserved communities.

To expand the number of interconnection points for local services, CBC has introduced a new Remote Passive Optical Network ("RPON") splitter service to its ISP members. This service reduces the cost of fiber access to its members and enables fiber access facilities to be deployed into smaller community groups. This service bundles a remote fiber splitter, transport backhaul to the local CBC node and basic VLAN routing for traffic aggregation with other ISP

customers. The RPON service is targeted for use by its ISP members to create a fiber access point into a community where the ISP last-mile provider can build fiber or wireless facilities for their customers. In addition to extending fiber deployment deeper into the smaller communities, the RPON service will be available with a minimal port commitment lowering the barriers to entry for smaller ISPs wishing to deploy Fiber to the premise networks.

From a technical perspective, CBC carefully estimated and tracked customer traffic demand to ensure that the network had enough router ports to meet service demand. Since the inception of offering middle-mile service over the 10 years ago, the Cooperative has upgraded its switching and routing equipment several times and continues to add 10 and 100 gigabit ports to CBC's network infrastructure, which can now be used to deliver high levels of bandwidth to any of these small, remote clusters.

VI. What technical performance characteristics will increase the attractiveness and usefulness of the statewide open-access middle-mile broadband network for commercial internet service providers?

CBC platform design is based on a wholesale business model. The 11 network nodes are bi-directionally fed from both the North and South ends of the network, over middle mile facilities that are 100% underground. Each node has a minimum 72-hour battery backup and generator with fuel for 100 hours of service before refilling. CBC offers full and half rack colocation services and dual DC power feeds for ISP customers.

CBC recently upgraded the lit middle-mile network to meet ISP service requirements with up to 800 gigabit capacity. The system in total is engineered for transport capacity of 7.7 terabits by installing additional cards. CBC's lit backhaul services are engineered with 1xN shelf-level diversity for protection and its OTN transport equipment that allows the Cooperative to offer service availability from one gigabit per second to 100 gigabits per second.

VII. What network design and other design, technical, business, and operational considerations will increase the attractiveness and usefulness of the statewide open-access middle-mile broadband network for commercial Internet service providers?

All plant is underground. Nodes are bi-directionally fed for diversity. Direct interconnection with the major internet networks is available at the north and south ends of

the routes. In the event of a cable cut, CBC lit services are also available in a mesh service design routed over diverse paths.

Service response is critical for reliable service. The Cooperative's manager employs a staff of locally dedicated technicians and installers that maintain and service the over 500 miles of network.

In addition to service reliability, the network must establish a communications channel to reach out to potential customers, provide customer service and intake ISP service orders. The Cooperative's manager has established flow-through provisioning methods and staff to handle service requests from its IPS members so that customer orders are rapidly provisioned. In addition to supporting service requests for service in existing fiber locations, the Cooperative provide turnkey special construction to extend fiber services to unserved locations.

Finally, as indicated in CBC's Comments, network design and flexibility are critical to ensure that the Cooperative's network has the capacity to adapt to technical innovation. CBC agrees with Corporation for Education Network Initiatives in California's ("CENIC's") Reply to those comments that "networking design, engineering needs, and operating standards should be led with respect to what will constitute middle-mile services, including what is necessary for route capacity."[3]

VIII. What services should the network provide commercial providers? (E.g., dark fiber, lit fiber, colocation, wireless backhaul, etc.)

The Cooperative offers a complete menu of wholesale services choices that facilitate end-user services offered by its ISP member businesses. CBC's service offerings range from Dark fiber to Lit services from one to 10 gigabits.

IX. How can the middle mile network enable last-mile connections in unserved, underserved, and served areas of the state?

[3] See CENIC Reply Comments filed September 21, 2021 at pp. 4-5.

In CBC's experience, wholesale Internet access is available at a reasonable price once middle-mile facilities are deployed into an area. After that, Internet service providers enter local markets to offer broadband to end users.

However, this has not led to ubiquitous broadband in every community within CBC's service area. The hope is the SB 156 will lead to subsidy that will encourage deployment of affordable broadband at sufficient speeds in unserved and underserved areas. The primary gating factor for the Cooperative to expand its service area is a lack of available subsidies. CBC would be interested in enabling its County Members – Inyo, Kern, Mono, and San Bernadino Counties – to expand service choice and availability when and if funding is authorized consistent with the provisions of SB 156 which make it possible for counties to offer end-user service.[4]

X. If the network offers dark fiber, how many strands of dark fiber should the network make available on each route? What should the lease terms be?

The availability of any dark fiber facilities on a route should be subject to negotiation between parties on a non-discriminatory basis. CBC offers long haul dark fiber, interconnection and colocation services to ISPs and CLECs. The Cooperative welcomes the opportunity to discuss how CBC could meet the needs of the Golden State Middle Mile Network in CBC's service area.

XI. The middle mile network must prioritize connections to anchor institutions that lack sufficient high-bandwidth connections. Should the statewide middle mile network provide direct service to anchor institutions?

In areas where the anchor institution is already served by a fiber based open access provider at a reasonable rate the State should lease service from the provider and not build alternative facilities. As CENIC pointed out in its Comments, anchor institutions are "key tenants to the success of [CBC's] build.[5] CBC currently provides fiber optic cable to over 242 community anchor institutions. This gives anchor institutions in the Cooperative's service area

[4] See Government Code section 26231(b).
[5] See CENIC Comments filed October 1, 2021 at p. 5.

access to gigabit or better service. With greater subsidy and construction support the Cooperative could expand direct broadband service to anchor institutions.

XII. How can the middle-mile network enable last mile connections in unserved, underserved and served areas of the state?

CBC has 11 primary nodes along its route. These node facilities are located approximately 100 Km apart and are provide a full range of interconnection and colocation facilities to its Cooperative membership. In addition to access at the nodes CBC offers wireless and fiber interconnection with its ISP members at any technically feasible location along the Digital 395 route.

To expand the number of interconnection points for local services, CBC recently introduced a new Remote Passive Optical Network ("RPON") splitter service to CBC's ISP members. This service reduces the cost of fiber access to CBC's members and enables fiber access facilities to be deployed into smaller community groups. This service bundles a remote fiber splitter, transport backhaul to the local CBC node and basic VLAN routing for traffic aggregation with other ISP customers. The RPON service is targeted for use by CBC's ISP members to create a fiber access point into a community where the ISP last-mile provider can build fiber or wireless facilities for their customers. In addition to extending fiber deployment deeper into the smaller communities, the RPON service will be available with a minimal port commitment lowering the barriers to entry for smaller ISPs wishing to deploy Fiber to the Premise networks.

XIII. How can the middle mile network assist the operation and development of public broadband networks? Are there opportunities to aggregate network monitoring, provide a managed voice service, security services, call center, and other back-office services among public networks?

CBC exists to facilitate and develop last-mile ISP service providers and provide such services to its customers. End-user services, such as Internet access, and voice services, network monitoring, end-user customer billing, have a higher level of complexity and cost to provide. With respect to these services, end-user service providers should be responsible to

provide these services to their customers. Rules that determine that such services should be provided by a middle-mile network provider who has no contractual relationship with the end-user would be economically burdensome and administratively cumbersome.

XIV. Conclusion

These Comments further demonstrate that CBC offers the Golden State Middle-Mile Network several options to fulfill its legislative mandate along the Highway 395 corridor served by CBC without compromising the investments that the federal government and the State of California have made in CBC. The Digital 395 middle mile network is the premier ISP service delivery platform in California and has capacity immediately available to be provisioned to meet the goals of SB 156.

DATED: 10/15/2021

Respectfully Submitted,

/s/ Robert Volker

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