From:	Elizabeth Bojorquez
To:	CA Broadband Council
Cc:	Carolyn McIntyre
Subject:	CCTA Policy Briefs
Date:	Friday, November 13, 2020 5:03:45 PM
Attachments:	CCTA Open Access Policy Brief to CBC 11.13.20.pdf CCTA Speed Policy Brief to CBC 11.13.20.pdf

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Good Afternoon:

Attached are two policy briefs prepared by the CA Cable and Telecommunications Association for consideration by the Broadband Council as the Broadband Action Plan is developed and finalized. We will be submitting one more brief to the Council next week.

Thank you,

Elizabeth Bojorquez
California Cable & Telecommunications Association
[redacted]

California Cable & Telecommunications Association

Carolyn McIntyre
President

[redacted]

November 13, 2020

Amy Tong
Director, California Department of Technology
1325 J Street, Suite 1600
Sacramento, CA 95814

Re: Policy Brief – Open Access

Dear Director Tong:

The California Cable & Telecommunications Association ("CCTA") submits this policy brief to supplement its letter dated September 17, 2020, which extended the support of the cable industry in connection with the Governor's Executive Order N-73-20 on broadband ("EO"). This policy brief responds to proposals to adopt "open access" requirements in state broadband policy and in the State Broadband Action Plan that the California Broadband Council ("CBC") is directed to create by December 31, 2020. Significantly, the EO does not mention "open access." In addition, as explained below, "open access" has no basis in statute, is an unproven and extremely costly broadband deployment model, and does not advance the state's primary objective of expeditiously connecting households.

First, the EO directs that the State Broadband Action Plan set forth a roadmap to "accelerate" broadband deployment with consideration of state and federal funding opportunities. Although "open access" is not mentioned in the EO or in the CBC draft plan made public October 23, 2020, some stakeholders have proposed that "open access" networks be required and that public broadband funds prioritize "open access public benefit networks" operated by government entities. However, "open access" has no basis in statute and is not a condition to any existing broadband funding source. In fact, neither "open access" nor "open access public benefit network" are accepted industry-wide terms. State legislation in 2020 that included "open access" requirements failed passage, and "open access" proposals very recently made by the California Public Utilities Commission ("CPUC") are highly controversial and unproven.

Second, "open access" proposals are at odds with California's goal of expeditiously connecting *households* that currently lack broadband service needed for working at home, distance learning, civic engagement and telehealth. Certain parties would require that all middle-mile broadband networks funded by the California Advanced Services Fund ("CASF") have "open access" and would *prohibit those providers from also offering last-mile service to customers*, relying on the theory that other service providers eventually would — somehow, some day,

with hypothetical funding — connect to the middle-mile network and build the facilities necessary to serve households. Given the urgent need to connect unserved households during the pandemic, it would be inefficient and ineffective to pursue a strategy that theoretically could achieve that goal only in the long term, if at all.

Third, the claims that "open access" requirements will create competition and result in lower broadband prices for consumers do not make sense, especially in the remote rural areas with sparse population that remain unserved and are the priority in the EO and in the CASF program. Some parties make unsupported generalized claims that an "open access" approach creates competition from multiple providers seeking to utilize the middle-mile network, thereby driving down end user prices. For example, the Electronic Frontier Foundation ("EFF") has pointed to a purported "open access" success story in another state that was contingent on a single last-mile provider being granted "exclusivity" (i.e., monopoly status) to make the project viable, which contradicts and undermines the core theory that "open access" creates competition and consumer benefits. This example — which EFF claims may "eventually" lead to competition — also involved an electric utility, a model that raises fundamental concerns regarding cross-subsidization from electric ratepayers and is an apples-to-oranges comparison with imposing "open access" requirements on an internet service provider ("ISP").

Fourth, "open access" is a high cost-to-value proposition, as acknowledged even by its supporters, and, therefore, it is not the fastest or the most efficient way to address the digital divide. In filings with the CPUC, multiple parties, including consumer groups and EFF, refer to "significant and costly incentives or subsidies" associated with "open access" requirements, and the need for "increased financial support" and "higher levels of subsidy support." The Rural County Representatives of California states that "open access" networks must be "subsidized, possibly through in-kind options," although with no definition of those subsidies. EFF, with sparse detail on sources of funding, refers to the need for 30-year "long-term low-interest financing" as an alternative to "standard subsidies" for "open access" networks to be viable.

Fifth, technical issues and underinvestment would plague an "open access" regime. If providers were forced to share their networks to provision fiber for other service providers, it could diminish the network's design and even prove infeasible in many cases. Unlike a traditional telecommunications network designed with cross-connects at various locations throughout the network, for CCTA members, their transport facilities were not built for other ISPs to access their networks, and do not necessarily have capacity for collocation. In addition to these technical issues, the history associated with the adoption of open access frameworks, such as in Europe, revealed that it created an investment disincentive for facilities-based competition and resulted in less robust network infrastructure – which became clearly evident during the pandemic, when networks historically subject to that regime had to seek bandwidth throttling for over-the-top video as a result changes in broadband consumption stemming from the

COVID-19 virus. This stands in contrast to networks in the United States, built on a facilities-based competition model, which performed exceptionally well.[1]
Moreover, to the extent "open access" presents any promise to connect households in California's remaining unserved areas, public subsidies would almost certainly be required for *both* the middle-mile "open access" provider *and* the multiple last-mile providers that theoretically would compete to serve customers. This scenario simply ignores the reality of a lack of a viable business case for even one provider in sparsely populated rural areas, which is why these areas remain unserved in the first place. This need to subsidize multiple providers under an "open access" regime contradicts a key principle of federal and state universal service programs that providing multiple public subsidies in these remaining unserved markets will likely lead to all providers failing. For example, only one last-mile provider would be eligible for a CASF grant because the area would thereafter be "served." It would be irresponsible, inefficient, and unfair to impose surcharges or taxes on consumers to pay for this risky and unproven approach to extending broadband service to unserved households.

Finally, an "open access" mandate would amount to an unlawful common carrier requirement on broadband, which is an interstate information service under the exclusive jurisdiction of the federal government. Under the federal Communications Act, the Federal Communications Commission ("FCC") has exclusive jurisdiction over interstate services.[2] And as the FCC and courts have consistently recognized, broadband is an interstate service for regulatory purposes.[3] Further, the federal Communications Act specifically exempts information services from common carrier regulation, in order to promote competition and investment by keeping regulatory burdens minimal. And it is well settled that Congress intended broadband services to be classified as information services under the Communications Act.[4]

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[1] See, e.g., Mike Robuck, Report: U.S. networks out perform Europe's during COVID-19 pandemic, Fierce Telecom (Jun. 22, 2020), https://www.fiercetelecom.com/telecom/report-u-s-networks-out-perform-europe-s-during-covid-19-pandemic; Anna-Maria Kovacs, U.S. Broadband Networks Rise to the Challenge of Surging Traffic During the Pandemic, Geo. Univ. (2020), https://www.ustelecom.org/wp-content/uploads/2020/06/PP-2020-06- Kovacs-internet-performance.pdf.

[2] *See* 47 U.S.C. §§ 151-152; *Nat'l Ass'n of Regul. Util. Comm'rs v. FCC*, 746 F.2d 1492, 1498 (D.C. Cir. 1984) ("*NARUC*"); *Ivy Broad. Co. v. AT&T Co.*, 391 F.2d 486, 490 (2d Cir. 1968).

[3] *See, e.g.*, *In re Protecting and Promoting the Open Internet*, Report and Order on Remand, Declaratory Ruling, and Order, 30 FCC Rcd 5601, 5803 ¶ 431 (2015) ("RIF Order"), *abrogated by In re Restoring Internet Freedom*, Declaratory Ruling, Report and Order, and Order, 33 FCC Rcd 311 (2018), *vacated in part by Mozilla Corp. v. FCC*, 940 F.3d 1 (D.C. Cir. 2019); *In re Vonage Holdings Corp.*, Memorandum Opinion and Order, 19 FCC Rcd 22404, 22412 ¶ 16 (2004), *aff'd*, *Minn. Pub. Utils. v. FCC*, 483 F.3d 570 (8th Cir. 2007); *U.S. Telecom Ass'n v. FCC*, 825 F.3d 674, 729-31 (D.C. Cir. 2016), *reh'g denied*, 855 F.3d 381 (D.C. Cir. 2017) (en banc).

[4] *See RIF Order*, 33 FCC Rcd 311, 312 ¶ 2 (2018); *Mozilla Corp. v. FCC*, 940 F.3d 1, 86 (D.C. Cir. 2019); *U.S. Telecom Ass'n*, 825 F.3d at 730-31; *NARUC*, 746 F.2d at 1498.

For all of these reasons, CCTA urges the CBC to reject proposals to adopt "open access" requirements in the State Broadband Action Plan and instead focus on strategies that can make immediate concrete progress toward accelerating broadband deployment, as set forth in CCTA's letter dated September 17, 2020.

Thank you for your consideration.

Sincerely,

Carolyn McIntyre

CAROLYN MCINTYRE
President

California Cable & Telecommunications Association

Carolyn McIntyre
President

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November 13, 2020

Amy Tong
Director, California Department of Technology
1325 J Street, Suite 1600
Sacramento, CA 95814

RE: Download and Upload Broadband Speeds

Dear Director Tong:

The California Cable & Telecommunications Association ("CCTA") submits the attached policy brief to supplement its letter dated September 17, 2020, which extended the support of the cable industry in connection with the Governor's Executive Order N-73-20 on broadband ("EO"). This policy brief relates to broadband service download and upload speeds and specifically refutes unsupported assertions by some stakeholders that symmetrical speeds are necessary to meet Californians' needs for distance learning, telehealth, and work at home. The attached CCTA brief includes the following key points:

- Order #1 of the EO directs that state agencies implementing the EO incorporate the goal that infrastructure investments enable broadband service with a minimum download speed of 100 Mbps.

- The EO does not mention a minimum upload speed or reference any need for symmetrical speeds.
- Stakeholders that propose adopting a symmetrical speed requirement in California broadband policy advance no evidence-based justification for this proposal.

- Broadband service with asymmetrical speeds – much higher download speeds than upload speeds -- has historically met consumers' functional needs and is currently adopted in federal and state broadband policy.

- Even with the recent surge and shifting patterns in broadband usage due to the pandemic, real world data demonstrates that broadband service with asymmetrical speeds has met consumers' preferences, usage, and functional needs, including, for example, usage by a four-person household engaged in simultaneous work at home and distance learning.

- Video streaming, gaming, and social media are asymmetric applications that account for more than 80 percent of peak traffic on broadband networks, and recent increased usage of Zoom, WebEx and similar two-way video applications do not change the long-standing asymmetric speed ratio.

- Cable industry consumer demand models and engineering analysis from CableLabs and other technical experts confirm that predicted future broadband usage will continue to need much higher download than upload speeds.

- Broadband network infrastructure that enables service with symmetrical speeds is significantly less efficient than infrastructure enabling asymmetrical speeds that meets and exceed consumer demand.

- If state policy unjustifiably requires broadband infrastructure with symmetrical speeds, the limited public broadband funds will connect far fewer unserved households and lead to more delay in closing the Digital Divide.

CCTA appreciates the CBC accepting the attached policy brief in the record for your consideration in adopting the Statewide Broadband Action Plan. In addition, as mentioned in the September 17 letter, CCTA again respectfully requests that the CBC accept our offer for cable industry technical experts to make a presentation to the CBC on broadband usage before and during the pandemic and forecasting for the future, focusing on which speeds of service are reflecting the consumer preferences, usage, and demands of Californians.

Thank you for your consideration.

Sincerely,

Carolyn McIntyre

CAROLYN MCINTYRE
President

Symmetrical Broadband Speed

The California Cable & Telecommunications Association ("CCTA") supports the goal of Governor Newsom to accelerate broadband deployment and connection to all Californians, but we strongly urge the California Broadband Council (CBC) to rely on experience and data related to speeds and usage of broadband networks in furthering this important goal. With 35+ years of expertise in designing, building, and operating real world broadband networks, the cable industry provides broadband internet access services based on technologies pioneered in cooperation with cable equipment manufacturers and CableLabs, the cable industry's innovation and R&D lab. By studying and understanding usage patterns and upload and download speed demands, the cable industry has continually exceeded broadband consumers' functional needs. Cable industry experience and data show that there is no need or sufficient justification for a mandatory symmetric broadband speed preference or requirement. On the contrary, analysis of current patterns and predicted trends in broadband speed usage shows that customer use remains highly asymmetric.

To require the building to symmetrical speed specifications that consumers would not use would be an inefficient, wasteful use of capital resources and would not further the goal of providing broadband for all, in fact, it would deter it.

Background

Governor Newsom's Executive Order N-73-20 ("EO") directs that the State Broadband Action Plan incorporate the EO's goal that infrastructure investments enable broadband service with a minimum download speed of 100 megabits per second ("Mbps"). While the EO does not identify a minimum upload speed, the California Broadband Council ("CBC") discussed incorporating a minimum *upload* speed into the plan, including a recommendation to match the 100 Mbps download speed with a minimum upload speed of 100 Mbps. That recommendation came from the Office of the Riverside County Superintendent of Schools, who recommends pursuing a minimum upload speed of 100 Mbps to match the EO's recommendation for a 100 Mbps download speed but offers little rationale for symmetrical speeds other than an observation that "in the current environment…education is being provided almost exclusively via remote learning technology..".[1] The Electric Frontier Foundation ("EFF") also supports symmetrical speeds but offers no justification for that recommendation other than to suggest that the facilitation of symmetrical speeds is a feature of fiber, and that feature is a significant advantage over other broadband mediums.[2] EFF does not provide information sufficient to explain why, in the absence of actual or forecasted consumer usage, imposing symmetrical speeds on Californians is warranted and fails to demonstrate any instance in which the existing cable operators' broadband networks were not sufficient to meet peak demands during the pandemic. To the contrary,

[1] California Broadband Council August 26, 2020, Meeting Minutes Written Comments of the Office of the Riverside County Superintendent of Schools at pp.8-9.

[2] https://www.eff.org/wp/case-fiber-home-today-why-fiber-superior-medium-21st-century-broadband

all CCTA members were praised for meeting the needs of customers and continuing to meet those needs during this period of heighted need.

I. Cable Industry Experience and Federal Communications Commission ("FCC") Research Both Show that Customers Download Far More Content Than They Upload.

A. Internet Usage Is Highly Asymmetrical

Cable companies have consistently increased both upstream and downstream speeds, in response to customer usage patterns, to ensure the best service possible and to meet user demand. While both upstream and downstream speeds have increased, residential broadband traffic consumption historically has been asymmetrical since most households are consumers of internet content and not producers of large volumes of internet content. A recent National Cable & Telecommunications Association ("NCTA") paper presented by CommScope designed to assist planning for cable platform enhancements for 10G[3] found residential broadband traffic consumption historically has been asymmetric and continues to grow more asymmetric. CommScope data also shows that while demand for network capacity has been increasing at a compound annual growth rate of 50%, this growth has been driven by downstream usage.[4]

B. Consumers' Usage Is Asymmetrical

Video streaming consumes the most residential broadband consumption and is highly asymmetric, having heavy downstream consumption and far less upstream consumption. Video streaming, gaming, and social media are also asymmetric applications and account for 80% of the peak traffic on broadband networks. Video alone accounts for 57% of peak traffic.[5] Over-the-Top ("OTT") video, such as content provided by Roku, Netflix, and Amazon Prime, has been rising for many years and higher bitrate 4K/UHD video titles provided by OTT providers and others will continue to drive greater downstream consumption.[6] [7] In fact, 4K and 8K video will have an even greater asymmetry by creating an increased demand for download speeds without a corollary demand for upload speeds.

The FCC also recognizes asymmetrical network usage meets needs of consumers when it determined that a 25/3 Mbps connection provides more than sufficient *download and upload* bandwidth to conduct

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[3] The 10G platform developed by the cable industry is a combination of technologies that will deliver internet speeds ten times faster than today's networks and 100 times faster than what most consumers currently experience. 10G will also provide lower latencies, enhanced reliability, and better security.

[4] https://www.commscope.com/globalassets/digizuite/1814-network-migration-strategies.pdf, at 5. CommScope has recently noted that, during COVID-19, upstream usage growth has increased in the near-term, https://www.commscope.com/blog/2020/flattening-the-broadband-curve/.

[5] Sandvine Global Internet Phenomena Report 5/20, https://www.sandvine.com/phenomena

[6] https://www.marketwatch.com/story/tv-cord-cutting-spikes-amid-stay-at-home-orders-2020-05-10

[7] https://deadline.com/2020/05/pay-tv-risk-penetration-falls-vmvpd-collapsed-1202929737/

a wide array of online activities, including high-bandwidth applications, for multiple users/devices in a household.[8]

C. The Amount of Data Asymmetry Will Continue To Grow.

It is forecast that the amount of data asymmetry will continue to grow. Internet traffic planning engineers have been accurately forecasting bandwidth consumption for the last 38 years and use Nielsen's Law of Internet Bandwidth[9] to forecast downstream bandwidth growth to forecast network capacity. The forecast concerns 'offered speed' to customers and not a customer's actual usage. Nielsen's Law is a postulate on internet downstream bandwidth growth that is analogous to Moore's Law for computer speed growth that states that:

> *A high-end user's downstream connection speed grows by 50% per year.*

Nielsen's Law downstream bandwidth forecast was quantified in 1998 using bandwidth data going back to 1983 and continues to hold true.

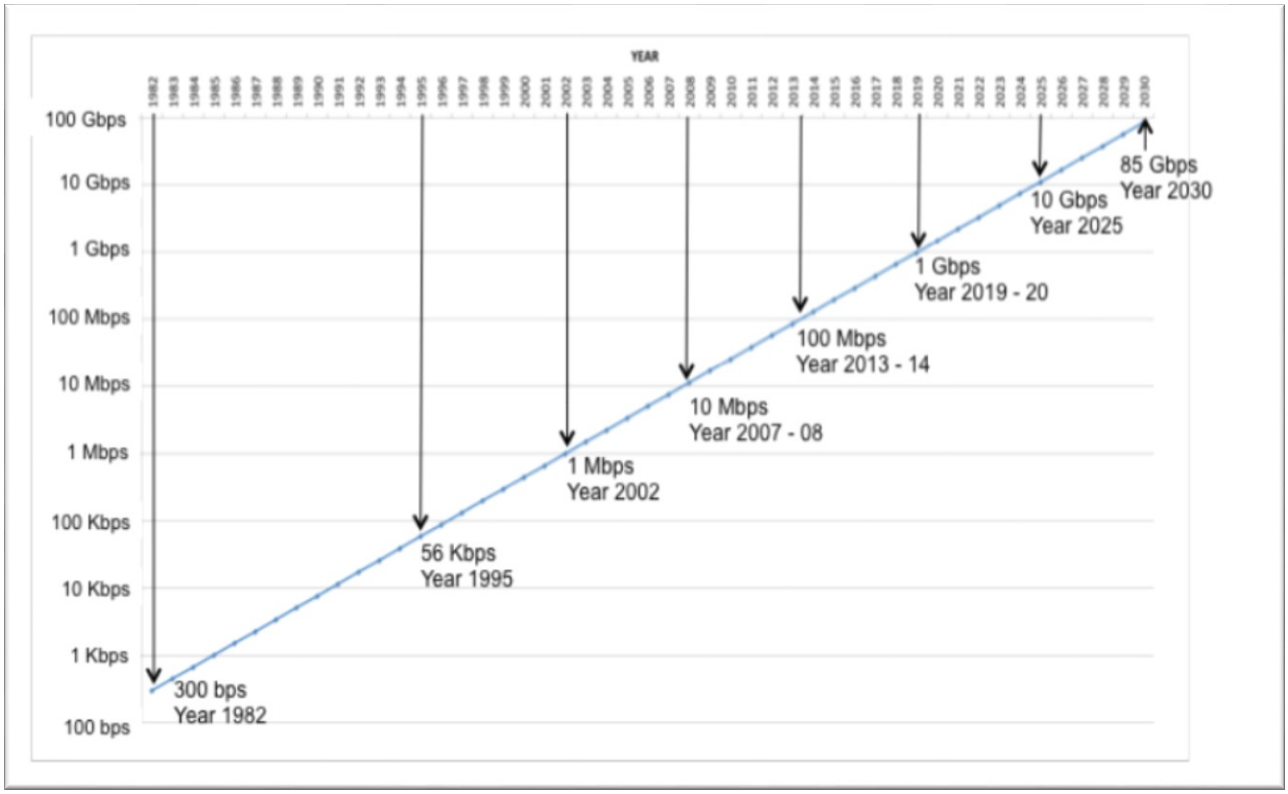

Figure 1 Nielsen Law of Internet Bandwidth Forecasts[10]

[8] (*See* FCC Broadband Speed Guide, https://www.fcc.gov/consumers/guides/broadband-speed-guide)
[9] https://www.nngroup.com/articles/law-of-bandwidth/
[10] Source https://www.nngroup.com/articles/law-of-bandwidth/

II. COVID-19 Has Not Fundamentally Altered Asymmetrical Usage

Though the recent spike in residential use of video conferencing and other upload-heavy capabilities resulting from the COVID-19 emergency has driven more growth in upstream usage than downstream usage in the last several months, the overall usage balance remains weighted heavily toward downstream use. Streaming video, which is heavily downstream, still accounts for 65% of our network traffic, and its persistent dominance continues to drive asymmetry today.[11]

Even accounting for the worldwide stay-at-home orders and the massive increase in video teleconferencing, the traffic ratio has stayed at or above any forecasts according to a report by. OpenVault, a leading provider of technology solutions and industry analytics for broadband operators. The OpenVault report[12] showed that even post stay-at-home orders the ratio of downstream traffic to upstream traffic was still asymmetrical with the average daily downstream consumption during 9 am-to-5 pm of 6.35 Gbytes and the average upstream usage was 0.39 Gbytes. Moreover, historical data going back to 2004 shows the traffic ratio really started to grow in 2012 when streaming video became a greatly valued and popular application. The huge growth in the use of video conferencing didn't change the trend as the ratio in 2020 is 14% greater than it was in 2019.

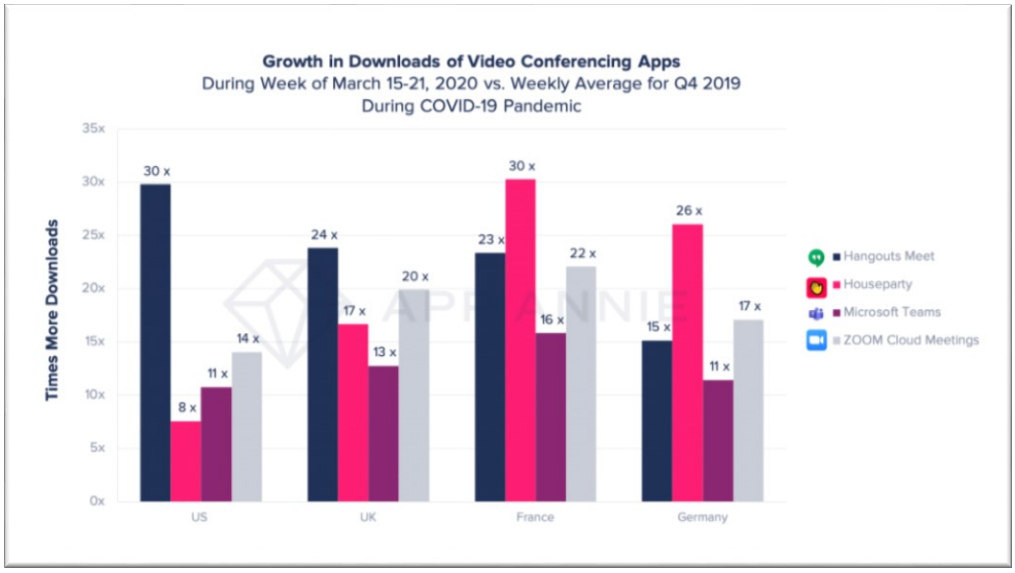

Figure 2 Growth in Video Conferencing Apps[13]

[11] Sandvine reports that, on a global level, streaming video accounts for "roughly 60%"of network traffic, https://www.sandvine.com/press-releases/sandvine-releases-covid-19-global-internet-phenomena-report.

[12] http://openvault.com/covid-19-broadband-usage-reaching-a-plateau-says-openvault/

[13] https://www.fonearena.com/blog/308740/video-conferencing-apps-demand-coronavirus.html

III. Real-World Examples Also Demonstrate the Demand is Far Below 1Gbps

There are instances where fiber deployment is an appropriate solution for broadband traffic needs. For example, server farms, universities, libraries, schools, and business campuses may exhibit different usage patterns that make fiber-to-the-premise broadband the most viable solution. However, most consumers do not share that level of demand. For example, there are no existing residential user applications that require upstream speeds of 1 Gbps. The table below shows the published bandwidth requirements for the upstream and downstream for the leading video conferencing platforms. These are the some of the most commonly used video conferencing platforms for personal communications, business meetings, telemedicine and e-classrooms.

	Minimum Bandwidth Requirements for Video Conferencing (Mbps)		
	High-quality	720p HD	1080p HD
Zoom	0.6	1.2	1.8
Lifesize		0.6	1.2
Skype	0.4		1.2
Polycom		0.5	1.0
Webex	0.5	0.8	1.5
GoToMeeting		0.7	

Table 1 Video Conferencing Apps Bandwidth Requirements

https://support.zoom.us/hc/en-us/articles/201362023-System-Requirements-for-PC-Mac-and-Linux
https://www.lifesize.com/en/video-conferencing-equipment/icon-400-camera
https://support.skype.com/en/faq/FA1417/how-much-bandwidth-does-skype-need
https://www.polycom.com/content/dam/polycom/common/documents/data-sheets/studio-x50-data-sheet-enus.pdf
https://www.cisco.com/c/en/us/products/collateral/collaboration-endpoints/spark-room-kit-series/datasheet-c78-738729.html
https://support.goto.com/meeting/help/how-much-bandwidth-is-used-during-a-session-g2m010029

IV. Cable Companies Already Have Solutions That Are Available to Deliver Greater Speeds

The Cable Industry networks are designed to meet a greater demand for speed when the need arises[14]since hybrid fiber coaxial (HFC) cable systems are capable of moving to symmetric gigabit speed as consumer use cases demand. In fact, 1 Gbps downstream speeds are already available to tens of millions of homes via HFC networks and can be deployed far more quickly than running fiber to that number of homes. Similarly, higher upstream speeds and symmetric gigabit speeds will be broadly available over time due to the adaptive and scalable nature of HFC networks.

[14]Network capacity demand growth estimates based upon Nielsen's law of Internet bandwidth do not show significant demand for 1 Gbps upstream speeds emerging until well into the 2030s, https://www.nngroup.com/articles/law-of-bandwidth/.

V. A Focus on Symmetry Must Not Undermine Other Network Advancements That Will Improve Customer Experiences and Meet Future Needs.

A focus on reducing latency in throughput-sensitive services may be more critical to enhancing the customer experience in the coming decade than absolute bitrate or symmetry. Gaming is today's low-latency application of note and is becoming more demanding due to cloud gaming platforms. The growth and efficacy of various IoT services, augmented reality and virtual reality offerings, and machine-to-machine applications also will depend on reducing latency in order to offer a seamless, real-time experience that will enhance these services and capabilities.

Plans for deployment and utilization of low-latency capabilities are currently a greater priority for enhancing the consumer experience. The CBC should resist calls for symmetry as a solution to California's future broadband needs and a misguided attempt to future-proof networks and instead support measures that take into account how consumers actually use broadband networks, and to effectively and cost-efficiently improve those networks.

VI. Conclusion

CCTA looks forward to a continual engagement with the CBC and with all the state agencies responsible for implementing the EO to achieve the state's broadband goals. We respectfully reiterate our request that the CBC accept our offer for cable industry technical experts to make a presentation on broadband usage before and during the pandemic and forecasting for the future, focusing on which speeds of service are reflecting the consumer preferences, usage, and demands of Californians. Thank you for your consideration.