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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 No. 20-09-001

CALIFORNIA EMERGING TECHNOLOGY FUND

REPLY COMMENTS ON SB 156 MIDDLE-MILE ISSUES

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Pursuant to Rule 6.2 of the Commission's Rules of Practice and Procedure and the schedule set in the Assigned ALJ's Email ruling extending comment deadline, August 20, 2021 ("Scoping Memo"), the California Emerging Technology Fund ("CETF") hereby files its Reply Comments on the Senate Bill ("SB") 156 middle-mile issues, set forth in the Assigned Commissioner's Ruling, dated August 6, 2021 ("Ruling"). A nonprofit organization devoted to closing the Digital Divide in California, CETF hereby responds to other parties' comments on SB156 middle-mile issues.

CETF first replies to general comments by the parties in the Opening Comments, not associated with a specific question.

A number of commenting parties argue that the proposed Anchor Build Fiber Highways map is overbroad and may not be consistent with Senate Bill ("SB") 156 directives. For example, AT&T states that "the vast majority of the state highways shown on the Anchor Highways Map should be eliminated" due to its own fiber network in 80,000 locations and "routes identified as lacking middle-mile facilities should be prioritized according to unserved households in proximity to such routes and based on where existing or planned last-mile facilities require middle-mile infrastructure to connect to the Internet."[1] CETF strongly recommends that the Commission,

[1] Opening Comments of AT&T California on Assigned Commissioner's Ruling dated August 6, 2021, Regarding Middle-Mile Broadband Networks, Sept. 3, 2021 (AT&T Comments), at p. 3.

California Department of Technology ("CDT"), and the Third Party Administrator ("TPA")[2] verify the availability of such middle-mile infrastructure with sufficient capacity for all unserved last-mile households and all other anchor institutions and customers along the path of deployment through a "Request for Partnership" ("RFP") process set forth in CETF's Opening Comments.[3] If the RFP process verifies that adequate middle-mile infrastructure with sufficient capacity and affordable rates exists to the extent stated by an Internet Service Provider ("ISP") to reach unserved and underserved areas, then there is no need for the State to invest limited funds in duplicating middle-mile networks. Further, prior to the RFP process, CETF urges the Commission to actively and quickly confer with local governments, Regional Broadband Consortia, Tribal nations, and active ISPs to determine what unserved and underserved locations should be prioritized, and then provide this information to the CDT and the TPA in the required Commission Report.

CETF was impressed at the detail and thoughtfulness that went into opening comments in this phase by many ISPs, middle-mile providers, local governments, and broadband consortia on the Staff proposed Anchor Highway Map. There is much more information to be obtained from these entities that were not included in comments filed so far, however. This is why a focused consultation with these groups and other groups by region is strongly recommended by CETF in its opening comments.[4]

Further, there is no need to reinvent the wheel. An existing roadmap already is prepared for the Commission to consider and use: the Recommended Strategic Broadband Corridors Report prepared by the California Regional Broadband Consortia, dated December 31, 2019.[5] While this recent 2019 Report was based on 10 Mbps. download and 1 Mbps. upload broadband speeds, the Report still remains current and viable because it focused on getting to the hardest-to-reach

[2] The TPA for the California Mile Broadband Network (to be known as GoldenStateNet) has been named as CENIC by CDT. https://cdt.ca.gov/news/state-selects-third-party-administrator-for-broadband-middle-mile-network/

[3] California Emerging Technology Fund Comments on SB156 Middle Mile Issues, Sept. 3, 2021 ("CETF Comments"), at pp. 4-5.

[4] CETF Comments, at p. 4.

[5] https://calcog.org/wp-content/uploads/2020/10/CA-Regional-Broadband-Consortia-Recommended-Strategic-Broadband-Corridors-12-31-2019.pdf

households and would also serve all anchor institutions that are passed along the path of deployment, consistent with SB156.[6] Other considerations in setting routes should include overlaying broadband needs over planned transportation projects, including Caltrans projects, High Speed Rail, State Passenger Train System, State Water Project, Irrigation and Water Districts, and fiber builds by Investor-Owned Utilities (particular in areas impacted by wildfires). CETF identified other pending applications before the Commission that will provide critical middle-mile infrastructure, such as the Northeast Loop, Highway 299, and projects in the Redwood Coast Region.[7]

California Cable and Telecommunications Association ("CCTA") asserts that the comprehensive state highway coverage approach suggested by Staff in the Ruling fails to take the "worst first" strategy enunciated by Senator Mike McGuire, which is to first allocate funding for both middle-mile and last-mile infrastructure in areas where no service or very slow service exists. CCTA asserts that the first job is to identify those communities that are unserved, and then consider which state highway routes should be considered to be the middle-mile to serve those locations.[8] CCTA also advocates that consistent with SB156, the potential middle-mile network locations should "enable last-mile service connections."[9] CETF concurs with CCTA's interpretation of SB156, and agrees that the Commission's first job is to identify the unserved and underserved communities, before designating middle-mile routes to reach them (and to serve any unserved locations along the path to the unserved locations). As set forth in the CETF Opening Comments, "All investments in constructing government-owned middle-mile infrastructure should be prioritized to reach unconnected households, with special attention to high-poverty and Tribal Lands. Further the most cost-effective strategy is to focus on planning deployment to the hardest-to-reach unserved households, including all Tribal Lands, and then connect all other locations such as anchor institutes and small businesses along the path of deployment."[10]

[6] CETF Comments, at p.2.
[7] CETF Comments, at pp. 3-4.
[8] Comments of the California Cable and Telecommunications Association, Sept. 3, 2021 ("CCTA Comments"), at pp. 2, 4.
[9] CCTA Comments, at p. 4.
[10] CETF Comments, at p. 5.

A number of parties also comment that under Section 11549.54, the Commission should prioritize locations that enable last-mile connections to residences unserved by broadband speeds of 25 Mbps. downstream and 3 Mbps. upstream. These parties correctly note that the Anchor Build map uses 100 Mbps. to determine unserved households.[11] First, to put things in context, the State Legislature took a positive step forward to move the unserved speed marker from 10 Mbps. download and 1 Mbps. upload, to the 25 Mbps. download and 3 Mbps. upload speed ("25/3"), which is the FCC's minimum broadband speed. The Legislature is to be commended for this important step forward, which means rural, remote and Tribal Lands won't have slow, second-class networks as compared to state-of-the-art fast broadband networks in major urban areas. Second, CETF strongly agrees that the unserved and underserved communities with the slowest speeds (under 25/3) should be prioritized first, consistent with SB156.

Having said that, CETF disagrees that in considering locations of middle-mile facilities, the Commission may not also consider the need of communities for speeds exceeding the 25/3 standard. The Governor's Executive Order N-73-20 orders that "California state agencies subject to my authority are directed to pursue a minimum broadband speed goal of *100 megabits per second download speed* to guide infrastructure investments and program implementation to benefit all Californians." (emphasis added)[12] Further, it is clear that businesses and anchor institutions, such as schools, libraries and health care institutions in rural, remote and Tribal areas may have higher speed requirements than the 25/3 speeds that may be adequate for residential users. In the FCC E-rate Modernization Order, adopted July 11, 2014, the FCC adopted as a bandwidth target, the State Education Technology Directors Association recommendation for Internet access for schools of *at least 100 Mbps. per 1,000 students and staff* ("users") in the short term, and *1 Gbps Internet access per 1,000 users* in the longer term. With respect to libraries, the FCC Order adopts as a bandwidth target the American Library Association's recommendation that all libraries that serve fewer than 50,000 people have broadband speeds of *at least 100 Mbps.* and all libraries that serve 50,000 people or more have

[11] See for example, CCTA Comments, at 4; AT&T Comments, at p. 5; Opening Comments of Frontier California, Inc. Citizens Telecommunications Company of California, et al. Comments, Sept. 3, 2021, at p. 6; Comments of Comcast Phone of California, LLC (U-5698-C) on Assigned Commissioner's Ruling, dated September 3, 2021 ("Comcast Comments"), at p. 6.

[12] California Department of Technology is such a government agency.

broadband speeds of *at least 1 Gbps*.[13] Given the State Middle-Mile Network also will serve anchor institutions like schools and libraries, it should enable robust broadband speeds to both residential and anchor institutes for the next decades.

Finally, the US Treasury provided guidance in its Coronavirus State and Local Fiscal Recovery Funds (SLFRP) Frequently Asked Questions (FAQ) on broadband investments to be funded with its grants. (The California Middle-Mile State network is primarily funded with US Treasury SLFRP grant dollars.) First, Treasury defined "unserved or underserved households or businesses" to mean "one or more households or businesses that are not currently served by a wireline connection that reliably delivers at least 25 Mbps download speeds and 3 Mbps of upload speeds."[14] However, in providing funds for investments in broadband infrastructure, Treasury state such broadband investments should "provide service to unserved or underserved households or businesses that are designed to, upon completion: (i) reliably meet or exceed symmetrical 100 Mbps. download speed and upload speeds; or (ii) in limited cases, reliably meet or exceed 100 Mbps download speed and between 20 Mbps and 100 Mbps upload speed and be scalable to a minimum of 100 Mbps download and upload speeds."[15] CETF emphasizes that Treasury is providing clear guidance that broadband infrastructure projects should provide speeds of 100 Mbps. symmetrical speeds, or "in limited cases" 100/20-to-100 speed. This provides a solid basis for the State Middle-Mile Network to provide service at least for 100 Mbps. symmetrical service and 1 gigabit of service if a large anchor institution is to be served.

Comcast asserts that because the Middle-Mile Network will be paid for with federal Coronavirus State and Local Fiscal Recovery Funds, the State must comply with conditions and guidelines for such funds.[16] This guidance is laid out in the US Treasury SLFRP FAQ, dated July 19, 2021

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[13] FCC E-Rate Modernization Order, Paragraphs 34-38. FCC Order link: https://www.fcc.gov/document/fcc-releases-e-rate-modernization-order E-Rate Order Summary link: https://www.fcc.gov/general/summary-e-rate-modernization-order

[14] US Treasury SLFRP FAQ, Section 6.11, at p. 30. https://home.treasury.gov/system/files/136/SLFRPFAQ.pdf

[15] US Treasury FAQs, at Section 6.11, at p. 30.

[16] Comcast Comments, at p. 3.

("Treasury FAQ").[17] CETF agrees that is prudent to comply with US Treasury guidance. In the Treasury FAQ, Section 6.10 makes clear that recipients may use payments from the funds for middle-mile projects "but Treasury encourages recipients to focus on projects that will achieve last-mile connections – whether by focusing on funding last-mile projects or by ensuring that funded middle-mile projects have potential or partnered last-mile networks that could or would leverage the middle-mile network."[18] CETF cites this original language to demonstrate it is not mandatory as suggested by Comcast, but discretionary. This federal guidance, however, does give clear guidance to state Commissions that middle-mile projects need to achieve "last-mile connections" by ensuring last-mile projects will use and leverage the middle-mile network. Clearly, the federal guidance discourages a "If you build it, they will come" mentality, so for any proposed middle-mile project to achieve connectivity to an unserved or underserved community, there should be a last-mile ISP selected to construct the last-mile project to ensure the middle-mile project is properly leveraged. The CPUC's California Advanced Services Fund may be the funding vehicle to provide incentives for an ISP to commit to the last-mile project.

Verizon and GeoLinks both raise issues relating to wireless technologies. Verizon argues for the Commission to take 5G wireless service into account when looking at what areas remain unserved, and states its future 5G Home product will soon provide speeds of 100 Mbps. download and 20 Mbps upload.[19] CETF agrees that wireless provider input is important. CETF suggests 5G Home-type services are still relatively nascent, particularly in fixed wireless applications to residences and in rural, remote and Tribal Land areas. When deployed, 5G applications should be studied by the Commission to see if it will adequately and reliably support modern applications in the home requiring reliable and robust broadband speeds in unserved and underserved areas.

Geolinks argues for technology neutrality as to the proposed middle-mile definition, noting middle-mile facilities can be wireless, citing its successful and cost-effective use of microwave backhaul and fixed wireless middle mile technology to connect its own customers and on a

[17] https://home.treasury.gov/system/files/136/SLFRPFAQ.pdf
[18] Treasury FAQ, at Section 6.10.
[19] CellCo Partnership & MCImetro Access Transmission Service, Sept. 3, 2021 (Verizon Comments), at pp. 3-4 (citing Section 111549.54(i) to support input from wireless providers on middle-mile network planning by the CDT Office of Broadband and Digital Literacy).

wholesale basis for other service providers.[20] CETF has always stood for technology neutral solutions. Middle-mile by its nature is usually fiber-based for high-capacity purposes; however, CETF agrees that in some circumstances and for some applications, microwave backhaul and other fixed wireless technologies may be appropriate and should not be ruled out by a blanket definition.

AT&T requests that "any privately deployed middle mile facilities to be deemed affordable" due to process of economic analysis for areas where service is provided. AT&T cites an FCC finding that entry barriers are sufficiently low so competitors can deploy higher capacity transport services.[21] CETF has concerns over this proposal and proposed a different approach that will assure transparency and fairness. While entry barriers are low for competitors in the high-capacity transport areas, transport providers focus commercial service on urban and suburban areas where population density is high and last-mile ISPs desire service. In rural, remote and Tribal areas, where broadband projects don't meet the "return on investment" required by last-mile Internet service providers, this does not hold true. There are many examples where fiber runs down the main street of a very rural town like Comptche, California but the provider has declined requests from the rural town's customers to bring fiber service to the small town even though it announced it will not stop providing DSL service to the town.

Lumen urges an examination of construction problems associated with projects built by private carriers, and asked the Commission to develop a resolution process where the CPUC facilitates timely construction permits and other regulatory approvals with local jurisdictions and state agencies.[22] CETF concurs. While SB156 provides some CEQA relief for the state middle-mile project pursuant to a number of conditions,[23] Lumen correctly points to persistent and continuing permitting challenges that ISPs and middle-mile providers face in siting their broadband projects.

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[20] Opening Comments of California Internet, L.P. dba GeoLinks on Assigned Commissioner's Ruling, Sept. 3, 2021 ("GeoLinks Comments), at p. 2.
[21] AT&T Comments, at pp. 11-13.
[22] Comments of CenturyLink Communications, LLC, Level 3 Telecom of California, and Level 3 Communications, LLC on Assigned Commissioner's Ruling, Sept. 3, 2021 (Lumen Comments), at pp. 1-2.
[23] SB 156 added Section 21089.51 of the Public Resources Code.

1. **Identifying Existing Middle-Mile Infrastructure:**

   Attachment A provides a list of the state routes proposed for the statewide open access middle mile network, referred to as the "Anchor Build Fiber Highways." These routes may also be viewed on an ArcGIS map, which can be found here: https://www.arcgis.com/home/webmap/viewer.html?webmap=e17e4e1c88b04792ab0a2c50aa1a19a3&extent=-126.1445,34.5234,-113.5981,41.1113

   - **What routes, if any, should be modified, removed from consideration, or revised? Provide an explanation for these suggestions.**
   - **Are there existing middle mile routes that are open access, with sufficient capacity, and at affordable rates on the county highway routes listed in Attachment A?**
   - **In the context of these comments, what is sufficient capacity and affordable rates?**
   - **For routes that are identified as being open access, with sufficient capacity, and at affordable rates, how should the Commission verify these claims (e.g., should Communications Division send a data request for service term sheets, rates, approximate dark fiber, lit fiber, and conduit capacity, etc.)?**
   - **Are there existing middle mile routes that are open access, with sufficient capacity, and at affordable rates on the county highway routes listed in Attachment A?**
   - **Are there any other criteria that should be used to verify these claims?**

CETF is pleased and encouraged to see so many local governments, municipal economic entities, and Regional Broadband Consortia file comments with the Commission to express themselves as to the proposed routes on the Highway Anchor Build Map ("Map"). They raise many important issues of adequate capacity, necessary speeds, "future proofing," and affordability which the Commission should consider. The authorized State investment in a Middle-Mile Network is a rare opportunity to make a large leap forward to achieve the State goal of 98% broadband connectivity of our population in every region, if there is exercised the discipline of prioritizing middle-mile network deployment to reach last-mile unserved households. It is gratifying to see strong interest by so many stakeholders to help stand up the State Middle-Mile Network. CETF encourages the Commission and its CASF Staff to carefully consider the many detailed comments made by parties on the Map. Like many commenters, CETF joins in urging the Commission to establish as its top priority, providing middle-mile facilities to bring broadband service at the required speeds to unserved and underserved communities are required by SB156 and US Treasury guidance as previously referenced herein.

Some ISPs argue for no state middle-mile routes where they or other providers have existing

middle-mile facilities.[24] CETF recommends that existing middle-mile facilities could be excluded by the TPA if any of these conditions are true: (1) the capacity of such middle-mile facilities is full or close to full such as it could not serve the target unserved or underserved community at the minimum broadband speeds; (2) the middle-mile facility provider does not offer capacity on that middle-mile facility with an open access policy; or (3) the rate charged is not affordable, as compared to middle-mile rates in nearby urban areas or by a study by the Commission on middle-mile rates in competitive markets (not monopoly markets) in various regions. Note, however, that given the major California Tier 1 Internet exchange points[25] are in urban cities (e.g., Los Angeles, San Francisco, San Jose, and Sacramento), it is advisable that the state middle-mile provider has facilities direct to these major Internet exchange points, which means there may be some of the State Middle-Mile Network traversing into some major urban areas to directly connect to major Internet Exchange Points.

Some commenting parties argue that the Map is overinclusive and would potentially waste federal and state money by building in places that do not directly serve unserved or underserved communities.[26] CETF agrees. SB156 requires and US Treasury guidance encourages any middle-mile infrastructure to be built to achieve last-mile connections to unserved or underserved communities. Like those parties, CETF agrees that the targeted unserved and underserved communities must be first identified through an open and transparent local government and regional consultation process,[27] then a Request for Partnerships should be issued

[24] See for example, AT&T Comments, at pp. 16-17; Opening Comments of Charter Fiberlink CA-CCO, LLC and Time Warner Cable Information Services, LLC on the August 6, 2021, Assigned Commissioner's Ruling (Charter Comments), at pp. 7-16 (cautioning the cost of the proposed Staff middle-mile network would be $4.01 billion at p. 7); Comcast Comments, at pp. 12-13 (noting however that Comcast does not offer open access infrastructure itself).

[25] An Internet exchange point (IXP) is a physical location through which Internet infrastructure companies such as Internet Service Providers (ISPs) and Content Delivery Networks (CDN) connect with each other. These locations exist on the "edge" of different networks, and allow network providers to share transit outside their own network. By having a presence inside of an IXP location, companies are able to shorten their path to the transit coming from other participating networks, thereby reducing latency, improving round-trip time, and potentially reducing costs. At its core, a CDN is a network of servers linked together with the goal of delivering content as quickly, cheaply, reliably, and securely as possible. In order to improve speed and connectivity, a CDN will place servers at the exchange points between different networks.

[26] Charter Comments, at pp. 3-5, 7-14; Comcast Comments, at pp. 5-7.

[27] CETF Comments, at pp. 4-5.

by the Commission to see which ISPs will step up to provide necessary middle-mile or the last-mile segments to these unserved and underserved communities, and only then would necessary middle-mile routes be identified to bring service to the communities. This process brings any interested ISPs into the process to help achieve the State priority of service, and gives them a chance to step up to the plate or "step aside" without future challenge to new entrants.

Some existing middle mile providers such as CVIN LLC dba Vast[28] and County of Inyo as to the Digital 395 middle-mile network[29] have asked for their facilities not to be overbuilt, given they provide middle-mile services consistent with State policies and have open access obligations imposed by the ARRA programs such as BTOP. CETF concurs that instead of overbuilding these and similar facilities, it may be better to lease fiber from existing middle-mile networks if they are needed for a last-mile project. This can be left to the judgment of the TPA as it designs and builds the state middle-mile network, within the budgetary restraints.

Lumen, a private middle-mile provider, indicates it has an existing fiber network which the State can purchase IRUs.[30] Charter similarly notes that there are thousands of miles of middle-mile fiber with sufficient capacity available for commercial lease at market-based rates throughout the State and to duplicate them is wasteful.[31] CETF recommends that as to the State Middle-Mile Network, the first goal is to identify the unserved and underserved communities, and then explore the most cost effective routes to serve them. This may require new middle-mile facilities and it may also include IRU leases on existing networks if they are adequate for the task given the urgency of bringing broadband to all residents. The TPA should take the responsibility of designing and planning the required network, considering availability, capacity, cost, speed of construction, and other important factors. Finally, CETF emphasizes that all new middle-mile facilities built with State or Federal funding should be subject to open access requirements.[32]

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[28] CVIN LLC dba Vast Networks, Sept. 3, 2021 (CVIN Comments), at pp. 2-7.
[29] Opening Comments of the County of Inyo to Order Instituting Rulemaking 20-09-001, Sept. 3, 2021 (County of Inyo Comments), at pp. 2-3.
[30] Lumen Comments, at pp. 2-3.
[31] Charter Comments, at pp. 14-16.
[32] CETF does not support imposing open access requirements on last mile projects, however. See CETF Comments, at p. 6.

2. Priority Areas

Federal funding must be encumbered and spent in a limited time period. Additionally, unserved and underserved areas of the state are in substantial need of broadband infrastructure investment.

- **Is it reasonable to assume counties with a disproportionately high number of unserved households (e.g., 50% or more unserved at 100 Mbps download) are areas with insufficient middle-mile network access?**

The majority of commenters agreed with CETF that using a factor such as a high number of unserved households in a county is not the optimal approach, in that it is overbroad and should be more granular. Most commenters agreed that, pursuant to SB156 and US Treasury guidance, middle-mile investments need to be driven by paths to the hardest-to-reach last-mile unserved households, especially high-poverty areas and Tribal Lands.[33] SANDAG recommended that the Commission consider integrating public and private data from ISPs to ensure the determination of unserved households is informed by reliable data. SANDAG further recommends the Commission use more granular census blocks to determine areas with insufficient middle-mile access, and that the Commission should consider broadband subscription data, existing network locations, speed test information, and public information like population density and proximity to anchor institutions or public facilities.[34] CETF concurs.

- **What other indicators, if any, should the Commission use to identify priority statewide open-access middle-mile broadband network locations (i.e., built expeditiously, areas with no known middle-mile network access, regions**

[33] AT&T Comments, at pp. 16-17; Verizon Comments, at pp. 6-7; Lumen Comments, at p. 4; Charter Comments, at p. 19; Comcast Comments, at pp. 14-17, Cox Comments, at pp. 5-6; CVIN Comments, at pp. 6-7; GeoLinks Comments, at pp. 6-7; LCB Communications LLC and South Valley Internet Inc Comments on Middle Mile Issues, Sept. 3, 2021 (LCB/SVI Comments), at pp. 6-7; Race Telecommunications, LLC Comments on SB156 Middle Mile Issues, Sept. 3, 2021 (Race Comments), at p. 3; Southern California Edison Company's Comments on Assigned Commissioner's Ruling Regarding Senate Bill 156, Sept. 3, 2021 (SCE Comments), at pp. 9-11; Opening Comments of Calaveras Telephone Company, et al, Sept. 3, 2021 (Small LECs Comments), at p. 3; Opening Comments of Greenlining Institute to the Assigned Commissioner's Ruling Regarding Middle Mile Infrastructure, Sept. 3, 2021 (Greenlining Comments), at pp. 1-5; Open -Access Middle-Mile Initial Comments of Utility Consumers' Action Network, Sept. 3, 2021 (UCAN Comments), at pp. 4-5; and Opening Comments of the City and County of San Francisco in the Assigned Commissioner's Ruling Seeking Recommendations for the Locations for a Statewide Open-Middle Broadband Network, Sept. 3, 2021 (City of San Francisco Comments), at pp. 1-2.

[34] Opening Comments of the San Diego Association of Governments (SANDAG) on the Assigned Commissioner's Ruling Regarding Broadband Infrastructure Deployment, at pp. 8-9.

underserved by middle-mile networks, regions without sufficient capacity to meet future middle-mile needs)?

Reliance upon the State's broadband maps, the Recommended Strategic Broadband Corridors Report by the California Regional Broadband Consortia, dated December 31, 2019,[35] and focused consultations with local government and Regional Broadband Consortia should suffice to identify the areas of unserved and underserved communities with the most need. In the opening comments, parties suggest many other potentially useful indicators to identify unserved and underserved communities, including the following:

- geographic remoteness;[36]
- areas of past redlining;[37]
- lack of 5G wireless service;[38]
- counties with high rural residents, populations below the federal poverty line, and areas where there is limited competition by ISPs;[39]
- areas where the cost of last-mile infrastructure is high;[40]
- LA County areas where there is no Internet access, more than 20% lacks Internet access, household income is lower than $50,000/year, and residents are primarily people of color;[41]
- very rural projects where the cost per household is too great to justify the project;[42] and,
- areas with high concentrations of senior citizens, areas of slow economic growth or blight, areas with high concentration of at-risk students, low-income households, rural areas, and Tribal areas.[43]

These comments suggesting additional factors drive the point home that any new definition of "unserved" should include the need to bring broadband infrastructure access *to all the areas that historically have been unserved, for whatever reasons*. CETF reminds that the new definition of "unserved" also identifies other locations like unserved anchor institutions to be served along

[35] https://calcog.org/wp-content/uploads/2020/10/CA-Regional-Broadband-Consortia-Recommended-Strategic-Broadband-Corridors-12-31-2019.pdf
[36] Center for Accessible Technology (CforAT Comments), Sept. 3, 2021, at pp. 1-3 (counties with more than 35% of households lacking 100 Mbps. speeds).
[37] CforAT Comments, at pp. 4-6 (areas that have been historically redlined – classes C or D - should be considered as lacking middle-mile access); TURN, at pp. 6-9.
[38] Electronic Frontier Foundation, Sept. 3, 2021 (EFF Comments), at p. 5.
[39] Greenlining Comments, at pp. 1-5.
[40] County of Santa Clara Comments, at p. 6.
[41] County of Los Angeles Comments, at pp. 5-6.
[42] County of Mono, at pp. 4-5.
[43] SCAG Comments, at p. 7.

the path of middle-mile network deployment.

At the end of the day, the metric that counts more than anything else is how many of the hardest-to-reach households that previously had no access to high-speed Internet service have been connected, and how many households were in high-poverty areas and Tribal Lands. Real accountability for results (measurable "outcomes") needs to be built into the middle-mile initiative from the beginning.

3. Assessing the Affordability of Middle Mile Infrastructure

A key consideration is determining the cost of various middle mile services. Through identifying the costs of these services in California, as well as across the country and globe the Commission can identify a threshold whereby services can be considered reasonably affordable.

- **What are existing providers paying or charging for middle mile services?**
- **Are there other factors or sources of information the Commission should consider for determining whether these services are affordable?**

Southern California Edison (SCE) proposes that the Commission should issue a "Request for Information" or a "Request for Proposal" so existing middle-mile providers can submit sealed bids. SCE suggests the winning bid be made public upon award, but all other bids remain sealed. Somewhat similarly, CETF had suggested a "Request for Partnership" from ISPs as to service to specific prioritized unserved and underserved areas. In these RFPs, there may be included information to the Commission about existing costs for middle-mile services that are part of the bid.

CETF commends the parties who volunteered information about middle-mile costs in their opening comments.[44] CETF supports the Commission issuing data requests to obtain the costs for middle-mile services from the existing middle-mile projects funded with government

[44] Comments of the County of Los Angeles, Sept. 3, 2021 (LA County Comments) at p. 6; Opening Comments of North Bay North Coast Broadband Consortium on Assigned Commissioner Ruling Seeking Comment to Collect Recommendations for the Locations for a Statewide Open-Access Middle-Mile Broadband Network, Sept. 3, 2021 (NBNCBC Comments), at pp. 8-10.

dollars (CVIN and Digital 395), and other middle-mile providers who are subject to the Commission's jurisdiction. Such information should be kept confidential unless it has already been made public. This will assist in helping the Commission determine what middle-mile costs are reasonable.

- **Is it reasonable for the costs of these services to change depending on the location where the service is provided (i.e., rural vs urban)?**

The majority of commenters agreed with CETF that it is reasonable for costs of middle-mile service to change depending in whether service is to rural or urban areas. Lumen stated, "It is reasonable for costs of services to change based on location as there are numerous considerations underlying the costs for middle mile access including distance, terrain, geology, number of customers served per middle mile network, etc."[45] CVIN concurs, stating it is reasonable for a commercial company to base prices on the cost to serve customers which is dependent on location. CVIN also notes that urban areas have more customers per mile and greater competition which drives prices own. In rural areas, CVIN states there are fewer customers per mile and greater distances, making rural service costs higher.[46] CETF concurs with these observations.

4. Leasing Existing Infrastructure

Indefeasible Rights of Use (IRUs) are long term leases (generally 20 to 30 years) for unrestricted, legal capacity on a communications network for a specified period of time. These contracts generally obligate the purchaser to pay a portion of the operating costs, and the costs of maintaining the infrastructure.

- **If there is existing open access communications infrastructure with sufficient capacity to meet the state's needs, should the state purchase IRUs from that network?**
- **Is there any value in the state purchasing an IRU from the network if capacity is already available?**

Commenters were on both sides of the fence on these Question 4. CETF emphasizes that the purpose of the State Middle-Mile Network is not to cover the majority of the state with a

[45] Lumen Comments, at pp. 4-5.
[46] CVIN Comments, at p. 8.

comprehensive network. The primary purpose is to bring service to unserved and underserved communities where the lack of the existing middle-mile facilities is preventing service from being brought to that community. When viewed through that lens, the Commission should provide discretion to the TPA to determine what is cost efficient and speedy for a particular project, within the budget. The TPA was selected for its deep operational and technical experience in building high speed networks, and should be trusted to engineer the network properly.

- **If the state relies on IRUs for the development of the statewide network, will the generational investment that this funding provides be diminished when the IRU leases end 20 to 30 years later? Will existing networks run out of spare capacity?**

The comments show both wariness to rely only on IRUs for the Statewide Middle-Mile Network ("Network") versus pragmatism that leasing a long term IRU may be cost effective and bring service faster to an unserved or underserved community. The primary purpose of the Network is to enable broadband service to unserved and underserved communities where the lack of middle-mile facilities or cost-effective middle-mile facilities discourage service by private ISPs. If the TPA determines that in order to achieve this goal as to a specific project, it should have flexibility to decide to build middle-mile facilities versus enter a long term IRU, depending on the circumstances. Also, it is not possible to forecast how much capacity future end users will need with any certainty and so it should be left to the TPA's expertise to determine this as time goes on.

5. **Interconnection: The statewide network will need to connect with other networks in order to deliver services.**

- **At what points should the statewide network interconnect (e.g., to other networks, servers, etc.)?**
- **Are additional exchange points necessary or strategic, and if so, where?**

CETF generally agrees with commenters that urge the new State Middle-Mile Network should interconnect at the major strategic data centers in Los Angeles, San Francisco, San Jose and

Sacramento,[47] all feasible points,[48] in addition to considering construction of new Tier 2 and Tier 3 Internet Exchange Points out further in the network to reduce middle-mile costs[49] for rural, remote and Tribal projects. Los Angeles Economic Development Corporation suggests the Network provide exchange points to facilitate connections with municipal networks to drive local government costs down and increase competition in underserved communities.[50] CETF finds all of these ideas to have merit in different circumstances, and emphasizes the need for flexibility of the TPA to interconnect where necessary and advantageous to operate the new Network to best serve the ISPs and end users who rely on the Network. The Network should be engineered for reliability and incorporate redundancy in its paths for resiliency purposes.

6. Network Route Capacity: The state will need to determine the amount of capacity to build into the network to meet existing and future demand.

- **How many strands of fiber should the network deploy for each route?**
- **Are there other requirements or standards the Commission needs to consider to determine sufficient capacity?**
- **Should the network also deploy additional conduit within each route for potential future expansion?**
- **Should these factors change based on the population density and distance from the core network?**

CETF generally agrees with the parties that state there is no "one-size-fits-all" answer to how much fiber and conduit to include for a segment of the middle-mile network because it will depend on the characteristics of the particular last-mile project(s).[51] Very rural areas may require less fiber strands and thinner conduit. More densely-populated areas may require more fiber and wider conduit for future proofing. This decision should be left to the TPA's judgment as it designs each middle-mile segment to serve a specific unserved and underserved community. CETF agrees, however, with commenters who urge the Network not only be able to fulfill

[47] Race Comments, at pp. 5-6; CVIN Comments, at p. 10; LCB/SVI Comments, at pp. 9-10 (suggesting Carrier Hotels, Network Operations Centers, and Equinox Facilities in the Bay Area).
[48] Small LECs Comments, at p. 4.
[49] SCE Comments, at pp.15-16.
[50] LAEDC Comments, at p. 11-12.
[51] AT&T Comments, at p. 19; Verizon Comments, at pp. 11-12; Cox Comments, at p. 8.

current need at the mandated broadband speeds, but also be built to meet future needs to serve the State well for the next decades.[52]

WHEREFORE, CETF respectfully requests that the Commission consider its reply comments as to the SB156 middle-mile issues.

Respectfully submitted,

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[52] County of Los Angeles Comments, at pp. 7-8; Opening Comments of the Connected Capital Area Broadband Consortia, Sept. 3, 2021 (CCABC Comments), at pp. 9-10; CVIN Comments, at pp. 10-11; GeoLinks Comments, at pp. 9-11; LCB/SVI Comments, at pp. 10-11; LAEDC Comments, at pp. 12-13; UCAN Comments, at p. 6; Opening Comments of the Yurok Tribe on the Assigned Commissioner's Second Amended Scoping Memo and Ruling, Sept. 3, 2021 (Yurok Comments), at pp. 10-11; Comments of the County of Santa Clara on Assigned Commissioner Ruling, Sept. 3, 2021 (County of Santa Clara Comments), at p. 8; SANDAG Comments, at pp. 12-13; Opening Comments of the Southern California Association of Governments Pertaining to Proposed Rules for Broadband Infrastructure Deployment and to Support Service Providers, Sept., 3, 2021 (SCAG Comments), at pp. 12-13; CCABC Comments, at pp. 9-10.