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

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| Order Instituting Rulemaking Regarding Broadband Infrastructure Deployment and to Support Service Providers in the State of California. | Rulemaking 20-09-001 |

# SOUTHERN CALIFORNIA EDISON COMPANY'S (U 338-E) COMMENTS ON ASSIGNED COMMISSIONER'S RULING REGARDING SENATE BILL 156


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Pursuant to the August 6, 2021 *Assigned Commissioner's Ruling* (Ruling), Southern California Edison Company (SCE) respectfully submits these comments to the California Public Utilities Commission (CPUC or Commission) in response to the Ruling's request for input on the creation of a statewide open-access middle network, as set forth in Senate Bill (SB) 156.

The impact of SB 156 on California's broadband infrastructure is significant. Under SB 156, California would (1) appoint a Deputy Director for Broadband and nine-member council within the California Department of Technology, (2) hire a third-party to build and maintain the "middle--mile network" – high-capacity fiber lines that carry large amounts of data at higher speeds over longer distances between local networks, (3) invest $3.25 billion to target that middle-mile and build the broadband lines, and (4) provide $2 billion for "last-mile" infrastructure lines that will connect consumers' homes and businesses with local networks ($1 billion for rural communities; $1 billion for urban communities).[1] In short, California would be creating and running a public, state-wide telecommunications network for the first time.[2]

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[1] Section 7(b)(1)(A) of SB 156 provides that the goal of the Broadband Infrastructure Grant Account is, no later than December 31, 2026, to approve funding for infrastructure projects that will provide broadband access to no less than 98 percent of California households in each consortia region, as identified by the CPUC on or before January 2, 2022.

[2] Although the details of the State's role have not been fully developed, it appears that the State will be creating its own middle mile network by (a) leasing/licensing existing dark fiber capacity from

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## I.

## CREATING AND OPERATING A FIBER OPTIC NETWORK

### A. SCE is Well Positioned to Share its Experience and Expertise with the Commission on the Creation and Operation of a Fiber Optic Network

As indicated above, California will be investing $3.25 billion to create an open access, middle-mile network. As stated in the Ruling, a robust middle-mile infrastructure is essential in supporting broadband to California's unserved and underserved communities because middle-mile infrastructure connects the internet backbone with the last mile service providers of these communities.[3] As such, the State has turned to the Commission to prepare a staff report that will provide the locations for a statewide open access, middle-mile broadband network.[4] In this Phase III of the proceeding, the Commission is seeking input from parties to inform the Commission staff report on a variety of topics relating to the middle-mile network, including technical, business, and operational considerations.

SCE has a Certificate of Public Convenience and Necessity (CPCN) to operate as a commercial telecommunications carrier (i.e., Edison Carrier Solutions) and provide telecommunication services, such as building and leasing middle-mile dark fiber and providing lit services. The Commission granted SCE its telecommunications CPCN over 20 years ago,[5] and SCE understands the challenges of forming and running a telecommunications network. Over time, SCE gained experience building and maintaining a fiber optic network that currently consists of approximately 6,000 route miles of fiber. As a utility with a commercial fiber network, SCE's expertise may be helpful to the Commission. Further, given SCE's existing

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existing networks, (b) building (via a third party) new dark fiber, and (c) possibly providing or securing lit services on that fiber.

3 Ruling, p. 2.

4 August 2, 2021 Assigned Commissioner's Second Amended Scoping and Ruling, p. 2.

5 D. 98-12-083.

fiber optic network, SCE expects to be able to offer Indefeasible Rights of Use (IRUs) leases of its existing network to the State, which could be part of California's middle-mile network.[6]

## B. The Commission Should Design a Middle-Mile Network That Targets Rural and Remote Communities, which are the Communities That Need Broadband AND Where the Lack of a Robust Middle-Mile Network is a Barrier

Based on SCE's experience, SCE expects that the Commission's **first task** is to identify the unserved or underserved communities that need internet access ***and*** that would be best served by a more robust middle-mile network. To do this, SCE recommends that the Commission:

- ***Identify the unserved or underserved communities based on not only the number of households that lack adequate broadband, but also the population of these communities.*** As discussed in more detail in SCE's input to Topic 2 below, SCE expects that when a community's population is taken into account, the Commission will likely find that rural and remote communities have a greater percentage of residents that would benefit from a more robust middle-mile infrastructure than urban and suburban communities.
- ***Determine and fund infrastructure projects where the lack of middle mile (as opposed to last mile) infrastructure has been the barrier.***
  In this rulemaking, SCE believes that the Commission will find that the lack of middle mile infrastructure is not a barrier to providing broadband to urban and suburban communities. Rather, the lack of adequate broadband in rural and remote communities is more often due to the lack of middle-mile infrastructure, making it difficult to cost-effectively serve these communities. SCE addresses this issue in its input on Topics 2 and 3 below.

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[6] The discussion of IRUs is contained in Topic 4.

The $3.2 billion in funds from SB 156 is significant but must be spent in a limited time.[7] The Commission should thus design its middle-mile network to prioritize the funding of middle-mile infrastructure projects for communities where the lack of a robust middle-mile network is a barrier. After evaluation of the factors described above (number of unserved or underserved households in relationship to the communities' population, location of existing fiber, and whether the key barrier is the lack of middle-mile infrastructure or something else), SCE expects that the Commission is likely to find that rural and remote communities have a greater need for SB 156 funds and projects than urban and suburban communities.

The Commission's **second task** will most likely be helping the State design its middle-mile network based on its analysis from above. As indicated in the Ruling, middle-mile refers to the high-capacity, fiber optic cable network that connects the internet backbone with last mile providers that provide the wires, cables, wireless infrastructure, and other equipment for households and businesses.[8] Therefore, in designing the State's middle-mile network, SCE recommends that the Commission take into account the following:

***Designing around internet exchange points.*** While following highway routes in the ArcGIS' Anchor Build Fiber Highways map is helpful, it is more important to first start with the locations of the Tiers 2 and 3 Internet Exchange Points[9] and then design a network whereby routes extend from each of these points to reach the unserved and underserved communities. SCE addresses this issue in its input to Topic 2 below.

***Leveraging existing fiber networks.*** SCE recommends that the Commission examine whether there is available capacity on existing fiber networks for desired middle-mile routes. Given the deadlines imposed by SB 156, it is likely more efficient and cost effective for the State to lease/license capacity on existing fiber networks than build new middle-mile infrastructure for

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7 Ruling, "Priority Access," p. 5.

8 Ruling, p. 4.

9 There are two major Internet Exchange Points (Tier 1) in California located in Los Angeles and Palo Alto, as well as smaller Internet Exchange Points (Tiers 2 and 3) throughout the State except in rural areas where there are no Internet Exchange Points.

unserved and underserved communities, where existing networks are available.[10] The Commission is already contemplating Indefeasible Rights of Use (IRU) leases,[11] and the Commission should issue a Request for Information (RFI) to obtain information on available capacity and pricing. SCE addresses this issue in its response to Topics 4 and 5 below.

- ***Building new fiber routes:*** Where gaps remain, the State will need to build the routes for the middle-mile network to unserved and underserved areas. SB 156 already contemplates the need to build new routes,[12] and this should be accomplished through a request for information (RFI) or Request for Proposals (RFP). Since the State likely has the rights-of-way on the anchor highways located on the Anchor Build Fiber Highways map, the State could build new routes on the State's rights-of-way on the anchor highways. SCE addresses this issue in its response to Topic 1 below.

Using the tasks and steps described above as a framework, SCE addresses below the six topics covered in Section 3 of the Ruling:

(1) Identifying existing middle-mile infrastructure,

(2) Identifying priority areas,

(3) Assessing the affordability of middle-mile infrastructure,

(4) Leasing existing infrastructure,

(5) Interconnection, and

(6) Network route capacity.

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[10] See footnote 1. Further, the Ruling states, "Federal funding must be encumbered and spent in a limited time period." Ruling, p. 5.

[11] Ruling, p. 6.

[12] See paragraph 1 of these comments.

## II.

## SCE'S RESPONSE ON THE MIDDLE-MILE NETWORK TOPICS

### A. Topic 1: Identifying Existing Middle-Mile Infrastructure

#### 1. The CPUC's inquiry on Topic 1

The Ruling seeks input on the following: "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 [website address provided in original text of Ruling]:

- 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 any other criteria that should be used to verify these claims?"[13]

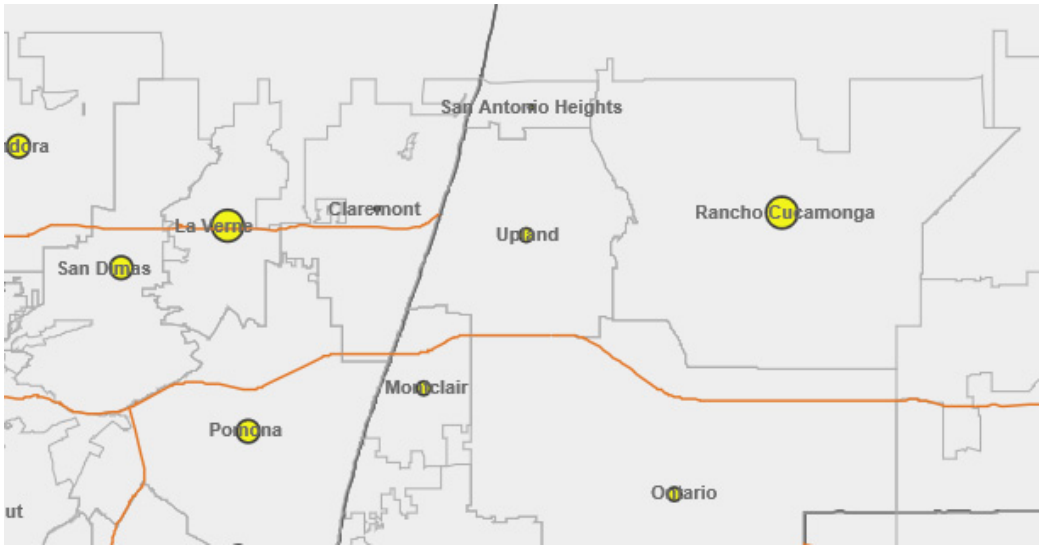
#### 2. SCE's Input on Topic 1

In Topic 1, the Commission seeks input from parties so that the State can identify the routes that will be part of its middle-mile network. Appendix A of the Ruling identifies over 225 potential Anchor Build Fiber Highways in California that could be included in the statewide

[13] Ruling, pp. 4-5.

open access, middle-mile network. Using the associated ArcGIS map, the proposed state routes appear to be congruent with California's highways, although there are some unexplainable gaps. For example, as seen in Figure 1 below, it is unclear why the 210 freeway on the ArcGIS map for Southern California stops at the border of Claremont and Upland, despite the fact that the 210 freeway runs through Upland and Rancho Cucamonga.

**Figure 1**




Presumably, California has rights-of-way along highways and can more easily develop a middle-mile network using the highway routes, which is helpful. However, to determine which highway routes should be modified, removed from consideration, or revised for the State's middle-mile network, the Commission should first identify those communities that are unserved or underserved and that would be best served by a more robust middle-mile network.[14] In other words, a more robust middle-mile network is needed for communities where the barrier to broadband is due to the lack of middle mile infrastructure but probably not needed for communities where the lack of broadband is due to different barriers. SCE expects that the Commission will likely find that rural and remote communities are the ones that are most likely

[14] See Task 1 described in Section I.B of these comments.

to need middle-mile infrastructure, as opposed to suburban and urban areas where lack of broadband for the relatively small pockets of residents is likely not due to availability of middle-mile infrastructure.

To design a middle mile infrastructure network, SCE recommends that the Commission: (1) identify the Tiers 2 and 3 Internet Exchange Points[15] that are closest to the rural and remote communities, (2) issue an RFI to determine if there is available capacity on existing networks that can connect these Tiers 2 and 3 Internet Exchange Points to unserved and underserved communities, and then (3) use the highway routes from the ArcGIS map to fill in the gaps where the State will need to build additional middle-mile infrastructure.[16] In summary, the Commission should focus on the highway routes on the ArcGIS map that can back-haul internet traffic from the rural and remote communities to the closest Internet Exchange Points.[17]

Regarding the Commission's inquiry as to whether there are existing middle mile routes that are open access, with sufficient capacity, and at affordable rates on the county highway routes listed in Attachment A of the Ruling, SCE recommends that the best way for the Commission to obtain this information is by issuing a RFI, which would also inform the Commission on its inquiry of how to define "sufficient capacity" and "affordable rates."

SCE does not have any input at this time regarding how to verify claims for routes that are identified as being open access, with sufficient capacity, and at affordable rates and is interested in other parties' views on this subject.

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[15] There are two major Internet Exchange Points (Tier 1) in California located in Los Angeles and Palo Alto, as well as smaller Internet Exchange Points (Tiers 2 and 3) throughout the State except in rural areas where there are no Internet Exchange Points.

[16] See Task 2 described in Section I.B of these comments.

[17] There are two major Tier 1 Internet Exchange Points in California, which are in Los Angeles and Palo Alto, as well as smaller Tiers 2 and 3 Internet Exchange Points throughout the State in urban and suburban areas.

## B. Topic 2: Identifying Priority Areas

### 1. CPUC's Inquiry on Topic 2

The Ruling seeks input on the following: "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?
- 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 underserved by middle-mile networks, regions without sufficient capacity to meet future middle-mile needs)?"[18]

### 2. SCE's Input on Topic 2

The Commission's inquiry in Topic 2 addresses the importance of identifying those communities that could best be served by a more robust middle-mile network and where the federal funding should be directed. The Commission appears to be examining this issue on a county-wide basis.

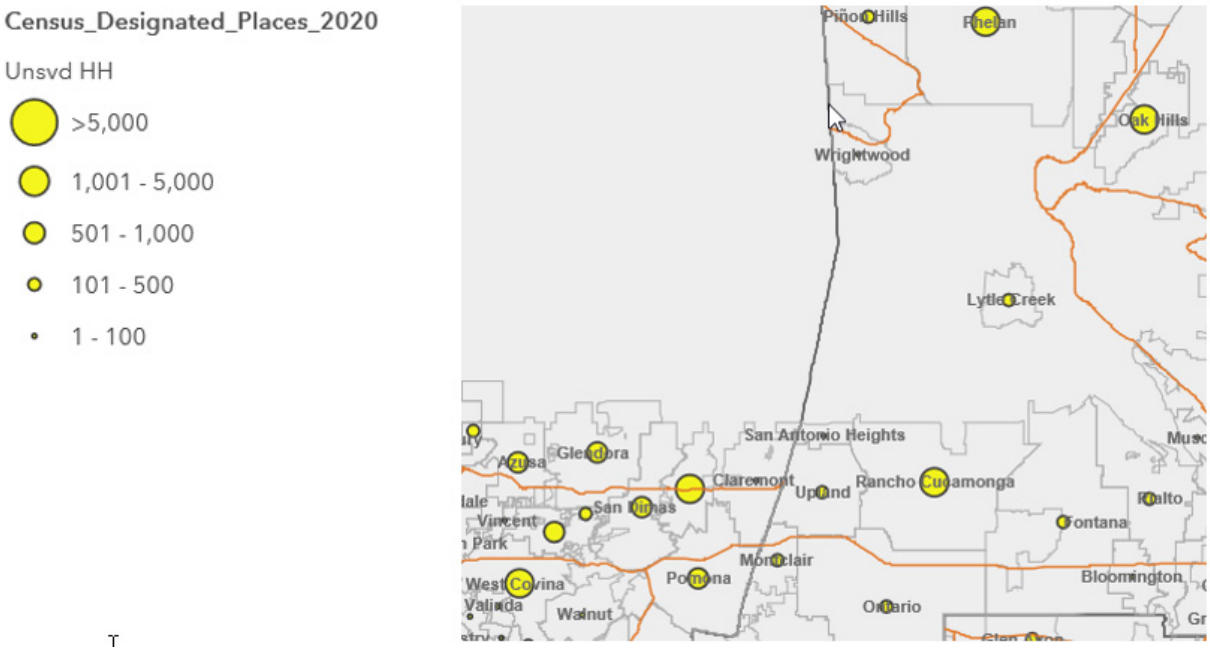
SCE has the following observations. First, using counties to analyze the number of unserved households, as indicated in the Commission's first bullet of Topic 2, is too broad. In Southern California, counties are very large and have a mix of well-served urban and suburban areas, in addition to underserved rural and remote areas. Assessing need at the county level may cause a county with a large well-served urban population to obscure a smaller but significant

[18] Ruling, p. 5.

unserved rural population. Therefore, rather than look at each county, SCE recommends evaluating smaller geographical units such as cities or communities.

Second, SCE agrees that the Commission should examine the percentage of unserved households in each city or community (vs. county) as a primary metric, but also that the Commission should consider the population of the city or community. Although the ArcGIS map provides useful information on the number of unserved households in each California city, the map does not contain the population of each city (which is available using 2020 census data). As an example, as seen in Figure 2 below, the Southern California cities of West Covina, Rancho Cucamonga, Phelan, and Oak Hills, each have between 1,001 – 5,000 unserved households based on the ArcGIS map:

**Figure 2**




However, when population is considered, the more remote cities of Phelan and Oak Hills have a significantly greater need for middle-mile infrastructure and service than West Covina and Rancho Cucamonga, which are more urban and suburban in nature. As seen in Table 1 below,

up to 48% of residents in Oak Hills and 31% in Phelan could be unserved, as opposed to 3% for Rancho Cucamonga and 5% for West Covina.

**Table 1**

| City | ArcGIS Map: Number of Unserved Households (HH), based on 2020 Census: between 1001-5000 | 2020 Census: Population | Percentage of unserved households (assuming 1,001 - 5,000 unserved HH for each city) |
|---|---|---|---|
| Rancho Cucamonga | 1001-5000 | 174,453 | < 1 - 3% |
| West Covina | 1001-5000 | 106,098 | 1 - 5% |
| Phelan | 1001-5000 | 15,987 | 6 - 31% |
| Oak Hills | 1001-5000 | 10,444 | 10 - 48% |

If the Commission were to do a similar analysis across the state, SCE believes that the Commission will likely find that the lack of broadband in rural and remote areas (such as Phelan and Oak Hills) are more likely to be resolved via a more robust middle mile infrastructure. Further, in this rulemaking, the Commission may find that the relatively smaller pockets of unserved or underserved residents of Rancho Cucamonga and West Covina are likely due to unavailable *last mile* (vs. middle-mile) service and infrastructure. Rural and remote areas are more expensive to serve per household due to the high cost of long middle-mile circuits and the need to extend the last mile to widely dispersed households. SB 165's middle mile funds should be used for projects that would create a middle-mile network to connect Tiers 2 and 3 Internet Exchange Points to rural and remote areas, which would then make high capacity middle mile more cost effective and readily available to these communities. The Commission's next priority should be for areas where dark fiber is available and ready to lease into rural and remote areas and last-mile providers are ready to step in. And, the lowest priority for middle-mile funding should be given to relatively smaller underserved pockets within urban and suburban areas where the lack of broadband is not likely due to a lack of middle-mile infrastructure or service.

## C. Topic 3: Assessing the Affordability of Middle-Mile Infrastructure

### 1. CPUC's Inquiry on Topic 3

The Ruling seeks input on the following: "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?
- 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)?"[19]

### 2. SCE's Input on Topic 3

The provision of middle-mile services is competitive in California. Commercial telecommunications carriers, like SCE's Edison Carrier Solutions, must compete by submitting bids to provide middle-mile services. Competitive middle-mile providers' rates, availability, and locations of dark fiber are generally proprietary, and providers are typically willing to disclose their confidential information only in sealed bids for projects. Even if a provider has publicly available list prices, a provider's price may decrease in a competitive bid. As such, SCE recommends that the Commission issue an RFI or RFP so that providers submit sealed bids and so the Commission can determine the cost of middle-mile services for a desired network. SCE has observed that in other public competitive bidding process for telecommunication services, the winning bidder's price is typically made public upon award, but all other bids remain sealed to protect the confidential and proprietary information. SCE recommends that the Commission follow the same process.

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[19] Ruling, pp. 5-6.

As SCE has indicated throughout these comments, SCE believes that the Commission will find in this rulemaking that the barriers for middle mile broadband infrastructure for rural and remote areas are greater than those for urban and suburban areas, and the Commission should focus on developing a middle-mile network that would support broadband to rural and remote areas. SCE expects that that the Commission will find that the cost of retail service to rural and remote areas will be higher than to urban and suburban areas due to the high cost of long middle-mile circuits and extending the last mile to widely dispersed households.

## D. Topic 4: Leasing Existing Infrastructure

### 1. CPUC's Inquiry on Topic 4

The Ruling seeks input on the following: "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?
- 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?"[20]

[20] Ruling, p. 6.

### 2. SCE's Input on Topic 4

IRU leases allow providers with *existing* networks to enter into prepaid, long term leases with the State, typically at discounted prices. The State's purchasing of IRU leases as part of its statewide, middle-mile network would provide the State will almost immediate availability because all construction delays associated with building a new network are avoided. As such, unserved and underserved communities could receive service sooner. In addition, an IRU would place the maintenance burden on a third party instead of the State. All costs are predictable because they are built into the IRU lease.

It is unlikely that the State will find a single dark fiber provider with an existing network who can serve the entire State. However, there are regional providers that can provide substantial portions of the network, and the state should purchase IRUs from these providers to rapidly provide middle mile capacity to unserved areas. As an example, the California Broadband Council (Council) owns and operates the Digital 395 Middle Mile Project, a telecommunications network in the Eastern Sierra region (from Barstow, California to Reno, Nevada). According to the Council, the Eastern Sierra region had low quality, and in many cases, no broadband communication capabilities. However, as a result of the project, schools throughout the region upgraded their connectivity from 3 Mbps to 1 Gbps at about half the price, Indian reservations in the region are now actively served by broadband, and the project connected to community anchors (schools, libraries, hospitals, etc.) and other service providers (telephone, cable, wireless) networks at 65 Points of Interconnection.[21] It would be beneficial for the Commission to purchase IRUs from entities such as the California Broadband Council who have existing networks in relatively remote areas such as the Eastern Sierras to rapidly improve access for unserved households in those regions.

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[21] The Digital 395 Middle Mile Project was jointly funded by the CPUC through its California Advanced Services Fund (CASF) program and federal legislation known as the American Recovery and Reinvestment Act of 2009. https://broadbandcouncil.ca.gov/wp-content/uploads/sites/68/2018/11/digital-395-middle-mile-project-11-13-18.pdf.

In response to the Commission's inquiry as to whether generational investment in funding IRUs is diminished when the IRU leases end 20 to 30 years later, fiber optical cable manufacturers tout the useable life of their cable at 40 years, however, as a practical matter, 20-30 years is more typical. With an IRU, the provider would have to rebuild any failed spans at its own costs. If a renewal period is built into the contract, the provider would be responsible for repairing the cable through the end of the initial term and any renewal periods. SCE also notes that if the State builds new cables for the middle-mile network, the State would have to rebuild the cable as it fails over time.

Finally, in an IRU lease, SCE recommends that the contract include the number of strands needed initially, with the ability for the State to expand the strand-count at a fixed rate.

## E. Topic 5: Interconnection

### 1. CPUC's Inquiry on Topic 5

The Ruling seeks input on the following: "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?"[22]

### 2. SCE's Input on Topic 5

In Southern California, the Tier 1 Internet Exchange Point is in downtown Los Angeles.[23] At a minimum, the State middle-mile network must connect at these points. Tier 2 Internet Exchange Points are located further throughout the metropolitan areas. However, in the rural areas, there are no Internet Exchange Points. This can drive up the middle-mile service costs for the rural internet service providers. It may be strategic to build new Tier 2 and Tier 3

[22] Ruling, p. 6.
[23] In Northern California, the location is in Palo Alto.

Internet Exchange Points out further into the network to save middle-mile costs between these new Internet Exchange Points and the Tier 1 Internet Exchange Points.

A possible solution for rural areas is to build new collocation/interconnection huts (i.e., small single use buildings that economically provide interconnection points for internet service providers) in places where fiber optic cables, ground space, vertical structures, and power are available for use by last mile providers. SCE has experience with wireless internet service providers placing their radio huts, towers, and antennas on SCE property, sometimes including antenna attachments on SCE transmission towers.

## F. Topic 6: Network Route Capacity

### 1. CPUC's Inquiry on Topic 6

The Ruling seeks input on the following: "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?"[24]

### 2. SCE's Input on Topic 6

If the State chooses to build its own fiber routes, the strand count per cable is dependent on its location in the overall network. For example, for a route-segment that is extended only into a single community, four strands are adequate. However, for the segments

[24] Ruling, pp. 6-7.

closer to the Internet Access Point, four stands will be required for every route extending from that Internet Access Point increasing that route's strand count substantially.

For the routes where an IRU is possible, the contract should include the number of stands needed initially. As indicated in SCE's input to Topic 4, to future-proof the network, SCE recommends that expansion of strand-counts be included in all State contracts for IRUs.

## III.

## CONCLUSION

SCE appreciates the opportunity to provide input on the Commission's efforts to support the State's efforts to create a statewide, open access, middle-mile network.

Respectfully submitted,

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