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

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| Order Instituting Investigation into the State of Competition Among Telecommunications Providers in California, and to Consider and Resolve Questions raised in the Limited Rehearing of Decision 08-09-042 | I. 15-11-007<br>(filed November 5, 2015) |

# OPENING BRIEF OF THE UTILITY REFORM NETWORK

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## I. INTRODUCTION

Pursuant to the July 1, 2016 *Scoping Memo and Ruling of Assigned Commissioner and Administrative Law Judge* ("Scoping Memo"), the Utility Reform Network ("TURN") files this Opening Brief. The Scoping Memo clearly sets out the goal for this phase of the proceeding,

> Indeed, the ultimate question before us is whether intermodal competition, in the decade after URF, has offered sufficient discipline to produce just and reasonable prices for traditional landline services. But to meaningfully answer that question, we must conduct a rigorous examination of the telecommunications marketplace to analyze the competitive forces acting upon traditional landline services.[1]

Through comprehensive expert witness testimony, discovery, data analysis and review of Respondent submissions, TURN has conducted a "rigorous" and data-driven analysis of the telecommunications marketplace in California to build a record that supports the Commission's data gathering and analysis in this phase of the proceeding. TURN urges this Commission to find, based on data and fact-finding on the record in this proceeding, that intermodal competition has not offered sufficient discipline to produce just and reasonable prices for landline services to satisfy the Commission's statutory obligations under Public Utilities Code Section 451.

### A. TURN's Data-Driven and Forward-Looking Analysis Reveals Market Failure

In response to the Commission's November 5th, 2015 Order Instituting Investigation ("OII"), TURN conducted an analysis of California voice and data telecommunications markets. As urged by the questions in the OII and the Scoping Memo, TURN's approach to market analysis is *comprehensive and forward-looking*. TURN witness Ms. Baldwin presented

[1] Scoping Memo at p. 2.

testimony primarily related to wholesale markets[2], while TURN witness Dr. Roycroft presented testimony primarily related to residential retail markets.[3] The analysis conducted by TURN witnesses was *data-driven*. TURN reviewed public data sources, received discovery responses from Respondents and analyzed the carrier responses to the Information Requests in the OII. TURN's witnesses utilized these information sources to analyze the relationships among all telecommunications technologies utilized in the state, including traditional TDM-based wireline services, VoIP services, fixed wireline and wireless broadband, wireless mobility services, and satellite broadband services. TURN's evaluation of markets considered differences in business and residential, and urban and rural markets, and also evaluated competition for broadband data services, as well as the relationship of traditional landline service to the state's overall telecommunications ecosystem, including the contribution of wholesale markets to retail markets

The record supports the proposition that there *is not* "one big market" for all telecommunications services in California. TURN's studies and analysis demonstrate that consumers face limits on their ability to substitute between alternative telecommunications services, and those limits result in boundaries between markets. Generally, consumers cannot substitute fixed services for mobility services, voice services for broadband services, or one incumbent carrier for another. Competition will be overstated if separation among markets is not identified by considering the limitations of one-way substitution, geographic and demographic boundaries, and the technical limitations of certain technologies. While wireless substitution has become much more pronounced among certain demographic and geographic customer groups,

[2] Opening Testimony of Susan M. Baldwin, March 15, 2016 (Exh. 53), Supplemental Testimony of Susan Baldwin, June 1, 2016 (Exh. 55) and Final Rebuttal/Supplemental Testimony of Susan Baldwin, July 15, 2016 (Exh. 56). In addition to addressing wholesale markets, Ms. Baldwin also addressed metrics and data for analyzing competition, and proposed barometers for assessing whether rates for basic local service are just and reasonable.

[3] Opening Testimony of Dr. Trevor Roycroft on behalf of TURN, June 1, 2016, (Exh. 54), Rebuttal/Supplemental Testimony of Dr. Trevor Roycroft on behalf of TURN, July 15, 2016 (Exh. 57).

those who cannot easily substitute wireless services for wireline are vulnerable to the exercise of market power. Moreover, the Commission must consider the impact of wholesale market concentration on retail rates and competitive alternatives. As TURN's witnesses demonstrate, consideration of all of these factors supports the proposition that separate markets exist for fixed and mobility voice services, and for fixed and mobility broadband services.

Effective competition for basic voice services does not exist. As a result, continuing regulatory oversight of basic voice service rates and service quality is appropriate. In addition, the Commission should focus on the adoption of wireline broadband services in California, which has expanded substantially over the past decade but has been adopted unevenly depending on demographics and geography. TURN's analysis of broadband markets suggests that the general conclusion reached in the 2009 *Limits of Choice* report—a wireline market duopoly for most California households—is still valid today not only for voice services but also with regard to wireline broadband. Moreover, the Commission must be forward-looking in its analysis and incorporate high-quality, high-speed broadband services, especially as those services are the foundation for new and innovative voice service, social media and other communications medium. For services that meet the FCC's 25/3 Mbps speed criteria, most California households now face a monopoly—only their cable provider is capable of supplying broadband service at this level. The low levels of consumer choice and high levels of market concentration in broadband markets, as discussed in TURN's testimony, suggests that market forces are not sufficient to deliver just and reasonable rates.

TURN also urges the Commission to acknowledge the critical role that wholesale markets play in the economy and competitive landscape. The demonstrated lack of competition in wholesale markets directly affects the development of efficient competition in retail markets,

only negligibly supports residential competition, and reflects uneven bargaining power between the incumbent local exchange carriers ("ILEC") and the competitive local exchange carriers ("CLEC") that rely on the ILEC wholesale elements. The Commission's continuing role as an arbitrator for any carrier-to-carrier disputes is critically important, especially as the transition to Internet Protocol ("IP") technology continues.

Instead of relying on broad generalizations, unsupported assumptions and purely academic theory, TURN witness Dr. Roycroft conducted a detailed study of deployment and service availability for wireline voice, fixed broadband, and wireless voice and broadband services. No party rebutted the results of this study nor did any Respondent attempt to provide a similar data-driven analysis. Dr. Roycroft used mapping technology and granular California-specific data to analyze the voice and broadband options for California's 17 counties consisting of 83.5% of the state's population. The level of geographic granularity was critical to the efficacy of the study. The fact that multiple carriers-- cable companies, wireless carriers, CLECS, and incumbent wireline carriers-- may operate in California does not imply that consumers have the ability to choose from all of these providers. These providers are generally constrained to certain geographic areas, having a profound impact on the ability of consumers residing in any particular community to find alternatives to the ILECs' basic service. The results of this analysis show that in most geographic markets consumers have a limited number of options for wireline voice and broadband services, which raises red flags regarding the existence of market power

TURN's market analysis reveals market behavior and limits on customer choice that can lead to no other conclusion than there is not sufficient effective competition to constrain rates for voice communications services:

- The CLEC sector has contracted, and plays a limited role in California's residential voice and broadband markets.

- Wholesale market limitations may be impeding competition and hindering market performance.

- Facilities-based wireline providers, such as AT&T and Comcast, continue to "stick to their turf," and do not compete in one another's service areas.

- The persistence of digital subscriber line ("DSL") technology and ILECs' overall failure to invest in their networks contribute to poor broadband market performance and a cable-supplied monopoly for high-quality broadband.

- Fixed wireless and satellite services suffer from technical limitations and are more expensive than wireline options, eliminating them as a reasonable alternative for most California households.

- Pricing behavior, and incumbent reactions to disruptive competitors, in wireline broadband markets is consistent with the existence of market power.

- Integrated mobility and wireline voice providers like AT&T California (and previously Verizon California) have unique incentives to raise wireline voice prices as demonstrated by AT&T's pricing patterns.

- Bundling practices and other efforts to "lock-in" customers are widespread in wireline and wireless markets, and these practices impose switching costs on consumers, and restrict customer choice and market entry.

TURN's detailed and California-specific analysis found that there is a confluence of factors that suggest that markets for wireline voice and broadband services are not subject to effective competition —market forces do not deliver adequate protection and just and reasonable rates for California consumers. Absent regulatory oversight, the limits on consumers' ability to choose from alternative services and suppliers, and the ease with which consumers can switch between those alternatives, will result in harms. If choice is limited and consumers cannot easily switch between providers, then, other things being equal, unregulated market outcomes may not satisfy public safety objectives, consumers will pay higher prices for service that may have declining quality, and firms will earn higher profits at the expense of universal service.

### B. Carrier Witnesses Present a Narrow and Backward-Looking Evaluation of California's Telecommunications Markets

Parties to this proceeding, including AT&T, Cox, Charter, Time Warner, and Comcast sponsored testimony from economic witnesses, all of whom present their conclusions to the Commission without having done a comprehensive, forward-looking, and data driven analysis. [4] For example, rather than recognizing, as the Scoping Memo does, that the wireline voice market cannot be understood without understanding the telecommunications ecosystem as a whole, the carrier witnesses encourage the Commission to ignore the role of broadband, and conclude that wireless cord cutting constrains carrier price increases for stand-alone services. Instead, the record clearly shows that carriers have raised prices significantly in the face of cord cutting. In another example, while AT&T witnesses Dr. Katz and Aron agree that the "degree of consumer choice" is an important measure of effective competition, neither witness presents a detailed analysis of consumer choice in the California voice market that incorporates the unique demographic and geographic characteristics of California consumers.[5] Further, during the hearing, Dr. Aron encourages the Commission examine the cross price elasticity of demand between wireless and wireline services to analyze substitutability, yet she only provides non-California specific academic studies to support her testimony while failing to offer data regarding "real-world" elasticity statistics.[6]

Carrier witnesses failed to provide a comprehensive analysis of competition as is evidenced by their almost exclusive focus on voice services. This focus was belied by carriers' contradictory efforts urging the Commission to find that communications technologies that have

[4] Drs. Aron and Katz on behalf of AT&T, Dr. Topper on behalf of Charter, Comcast, and Time Warner, and Mr. Gillan on behalf of Cox.
[5] Exh. 54 (Roycroft June 1), pp. 20-21.
[6] RT 83:21-84:28. Notably, TURN's attempt to gather carrier-specific elasticity figures for the record through discovery came up empty handed. Exh. 57 (Roycroft July 15), p. 9.

evolved over the past decade, and that rely on broadband services, are increasingly substitutes for basic service voice. On the matter of voice service competition, TURN finds some points of agreement with the carriers. It is clear that wireless substitution has become much more common than it was in 2009, and may exhibit some pressure on ILEC prices. However, TURN and carrier witnesses disagree on the ability of "market forces" to protect all basic service customers. The carrier testimony does not adequately address geographic factors such as the lack of cable service alternatives or weak or nonexistent wireless coverage that continue to hinder some consumers' ability to find reasonable substitutes for basic wireline service. Likewise, consumers with unique or particular characteristics and needs that can be fulfilled only by wireline services may also face limits on their ability to choose. The carriers miss the reality that harmful price discrimination is possible with regard to basic wireline voice services.

Furthermore, the carrier witnesses fail to reasonably address either wholesale or broadband markets, which are of increasing importance to California consumers, and for which evidence indicates that California consumers face far fewer choices than they do for voice services. On the matter of broadband service, the carrier witnesses offer testimony that is *backward looking*, focusing on very slow broadband services, such as 100 or 200 Kbps, that the carrier witnesses assert are sufficient to support over-the-top (OTT) VoIP services. This is a major shortfall in the carrier witness testimony. TURN believes that the Commission should be concerned with the status of broadband markets, given their growing importance to California consumers, and their growing role in delivering basic voice services. Understanding broadband markets is also critical for the evaluation of customer choices for voice services.

## II. DEFINING THE MARKET

The Commission opened this Investigation into the state of competition focusing on today's "telecommunications market and network."[7] Telecommunications markets continue to be segmented by customer class, geography, and access to different technology platforms. While many customers have cut the cord and gone wireless-only, many have not, and for those who do not find wireless-only to be a reasonable option, choices are limited.[8] As a result, the Commission must recognize that there are important market boundaries that support separate analyses of market conditions in mobility and fixed voice and broadband markets.

### A. SSNIP Test

Economists apply commonly established tools to define markets. Dr. Roycroft,[9] Dr. Topper,[10] and Dr. Katz,[11] all describe the economic approach employed by the U.S. Department of Justice to define a relevant market as whether a "hypothetical monopolist" operating in a market would find it profitable to implement a "small but significant and non-transitory price increase" on at least one product in the market. The shorthand description for this approach is the "SSNIP test."

The SSNIP test is based on the principle that for services to be considered in the same market, consumers must find the services to be substitutes. If sufficient substitutes for a particular service exist, then it would be impossible for a hypothetical monopolist selling a service to raise prices by even a small amount,[12] consumers would simply switch to the available

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[7] Scoping Memo at p. 1.
[8] RT 58:13-17.
[9] Exh. 54 (Roycroft June 1), p. 26.
[10] Reply Testimony of Dr. Michael D. Topper on Behalf of Charter Fiberlink CA-CCO, LLC (U6878c), Comcast Phone of California, LLC (U5698c) and Time Warner Cable Information Services (California), LLC (U6874c) July 15, 2016, Exhibit 42, p. 5.
[11] Exh. 54, (Roycroft June 1), pp. 25-26. See also, Exh. 57 (Roycroft July 15), p. 5 (quoting Dr. Katz).
[12] A similar effect can be had if the "hypothetical monopolist" can allow service quality to deteriorate, presumably as a cost savings measure. But, at some point, the carrier will lose more revenue than the

substitutes. When defining a market, the SSNIP logic is successively applied to market candidates until the hypothetical monopolist question receives an affirmative answer and it is profitable to raise prices, thus defining the market. For example, does the carbonated beverage Coca-Cola constitute a market? Given consumers' ability to substitute Pepsi, or other carbonated soft drinks, it would be unlikely that Coca-Cola could sustain a price increase, and under the SSNIP market definition approach, a broader market would next be considered, perhaps one that included Pepsi and all other carbonated soft drinks.[13]

Dr. Roycroft's analysis led him to conclude that there are separate markets for wireline voice, wireless voice, wireline broadband, and wireless broadband services. His conclusions were based on the application of the SSNIP test by economists and regulators in other venues, as well as expectations regarding the answer to questions regarding whether a hypothetical monopolist that provided wireline voice, wireless voice, wireline broadband, or wireless broadband services would find it profitable to increase prices by a small but significant amount. Dr. Roycroft concludes that there is not "one big market" for telecommunication services in California.[14]

**B. Wireline and Wireless Voice Markets are Separate Despite Some Substitution**

The Scoping Memo raises the question of whether mobile services are a substitute for wireline services.[15] Data indicates that about 42.8% of California households have cut the cord and only rely on wireless voice services, suggesting that a significant, but not majority, of

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money it saves. This possibility that a supplier may lose the business of a consumer is the manner in which a properly functioning and fully competitive market theoretically disciplines the actions of the business (i.e., the business cannot let service quality decline or raise prices too much because the consumer will simply buy services from another business). Exh. 53 (Baldwin March 15), p. 14.

[13] Exh. 54 (Roycroft June 1), p. 26.

[14] Exh. 57 (Roycroft July 15), p. 9.

[15] Scoping Memo, pp. 3, Attachment.

California consumers view these products as substitutes.[16] However, 55% of California households continue to utilize wireline voice services, suggesting that substitution is not uniform across the population.[17] Also, more households in California utilize both wireless and wireline services—48%—than those who have cut the cord, suggesting that consumers continue to find a complementary relationship between wireline and wireless services.[18]

Dr. Roycroft explains that the relationship between wireline and wireless voice is characterized by the fact that substitution between the services is not symmetric.[19] Wireless competes with wireline voice, but the reverse is not true—because fixed voice services are not mobile, consumers cannot substitute fixed voice offerings for mobility voice. In light of the one-way substitution, Dr. Roycroft testifies that it is appropriate to separately evaluate wireline and wireless voice markets—the markets are separate—and to then assess the impact of the one-way substitution arising from wireless in the overall evaluation of wireline voice market outcomes.[20]

It is likely that consumers who do not want or cannot afford bundles; who do not find wireless to be a viable substitute due to coverage gaps or the lack of wireless 911 location accuracy; who reside outside of cable service areas; or those that have a special need associated with wireline service—have no alternative to basic wireline voice, and thus are susceptible to the exercise of market power.[21] While carriers that offer bundles may adjust voice rates as part of the bundle in response to pressure from wireless mobility services, for stand-alone voice, market

[16] Exh. 54 (Roycroft June 1), p. 32, footnote 58 (The statistics offered by Dr. Roycroft were drawn from the most recent National Health Interview Survey for California-specific data).
[17] Exh. 54 (Roycroft June 1), p. v (approximately 2% of California households do not have telephone service).
[18] Exh. 54 (Roycroft June 1), p. 32.
[19] Exh. 54 (Roycroft June 1), p. 32.
[20] Exh. 54 (Roycroft June 1), p. 30.
[21] Exh. 54 (Roycroft June 1), p. v.

power is likely present.[22] Illustrative of this fact was an exchange between the ALJ and Consolidated witness Mr. Schultz. Mr. Schultz testified that his company had increased stand-alone basic rates by $2 per month (an 11% increase), with no impact on subscription trends in response to changes in federal regulatory policy.[23] This fact suggests that basic services consumers did not migrate in increased numbers to wireless services in response to the rate increase, indicating a lack of substitutability between wireless mobility and wireline services

In the context of the SSNIP test, Dr. Roycroft testified that other policy-making entities had concluded that wireline and wireless voice services are separate. For example, when evaluating the proposed AT&T/T-Mobile merger, the U.S. Department of Justice discussed the importance of the symmetry of substitution when applying the SSNIP test, and concluded that mobile wireless telecommunications services is a separate market:

> There are no cost-effective alternatives to mobile wireless telecommunications services. Because neither fixed wireless services nor wireline services are mobile, they are not regarded by consumers of mobile wireless telecommunications services as reasonable substitutes. In the face of a small but significant price increase imposed by a hypothetical monopolist it is unlikely that a sufficient number of customers would switch some or all of their usage from mobile wireless telecommunications services to fixed wireless or wireline services such that the price increase or reduction in innovation would be unprofitable. *Mobile wireless telecommunications services accordingly is a relevant product market under Section 7 of the Clayton Act, 15 U.S.C. § 18.*[24]

Certainly, it is still the case that neither "fixed wireless nor wireline services are mobile," and cannot reasonably substitute for wireless mobility services. It is still reasonable to conclude

[22] Exh. 57 (Roycroft Rebuttal), pp. 31-33.
[23] RT 126:15-127:27.
[24] Exh. 54 (Roycroft June 1), pp. 30-31, quoting: Second Amended Complaint, United States of America, State of New York, Office of the Attorney General; et al., Plaintiffs, v. AT&T INC., T-MOBILE USA, INC., and DEUTSCHE TELEKOM AG, Civil Action No. 11-01560 (ESH) (D.C. Cir.) , pp. 7-8. September 30, 2011. http://www.justice.gov/atr/case-document/file/487726/download

that a hypothetical monopolist that controlled all wireless mobility services would find it profitable to implement a small but significant price increase.[25]

Although AT&T witness Dr. Katz urges the Commission to look at the wireline and wireless market as a single market, he had previously presented testimony that treated wireless telephone service as being separate from wireline. In a declaration supporting an AT&T filing regarding the FCC's approach to evaluating competition in wireless markets (which the FCC describes as "Commercial Mobile Radio Services" or "CMRS"),[26] Dr. Katz treated wireless voice and wireless broadband services as being in a separate market, distinct from wireline. Dr. Katz's *CMRS Declaration* points only to wireless carriers as affecting competition:

> The Commission's historical consideration of market performance and conduct indicators has provided useful insights into whether competition among service providers is succeeding in advancing consumer welfare through the expansion of service offerings, the development and promotion of innovative technologies, and the lowering of prices. *For the better part of the past decade, those indicators have been consistent with an effectively competitive wireless industry. In its most recent study of CMRS competition, the Commission reported that 94 percent of all United States consumers had access to four or more wireless competitors. Output, prices, data speeds, broadband coverage, quality, and investment all continue to exhibit positive trends. And innovation is occurring at a significant pace as providers compete to offer new wireless features, functionalities, devices and applications.*[27]

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[25] See also, the FCC's analysis of wireless markets In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, WT Docket No. 15-125, Eighteenth Report, December 23, 2015. Noting what the relevant market is, so as to apply the Herfindahl-Hirschman Index to wireless market shares: "The Herfindahl-Hirschman Index ('HHI'), which is employed by the Commission to measure market concentration, is a widely-accepted measure of concentration in competition analysis. The HHI is calculated by summing the squared market shares of all firms in any given market." ¶23. The FCC then goes on to apply the HHI to firms in the wireless market alone. Id. ¶24.

[26] Exh. 57 (Roycroft Rebuttal), p. 10, citing: Reply Comments of AT&T, In the Matter of *Wireless Telecommunications Bureau Seeks Comment On Commercial Mobile Radio Services Market Competition*, WT Docket No. 09-66 (July 13, 2009). Exhibit A, Declaration of Michael L. Katz. Available at: http://www.att.com/Common/about_us/public_policy/Katz_Declaration-13July.pdf (Hereinafter "Katz *CMRS Declaration*.")

[27] Exh. 54 (Roycroft June 1), pp. 10-11, quoting Katz *CMRS Declaration*, ¶5 & 58.

The conclusions regarding market definition in Dr. Katz's *CMRS Declaration* are consistent with those reached by Dr. Roycroft in this proceeding—wireless and wireline service (either voice or broadband) are properly considered as economically separate markets.

The separateness is driven by the fact that substitution is not easily achieved. Wireline services cannot substitute for mobility services and substitution of mobility services for wireline services, while more likely, is not uniform. Limitations of the technology impacting signal strength, back up power, and emergency services, may discourage consumers from switching between wireline and wireless services. Likewise, some consumers may rely on complementary technologies associated with a wireline telephone, such as fax machines, alarm systems, or medical monitoring devices that may make it difficult or more costly to substitute with wireless. These factors suggest that it is appropriate for wireline and mobility markets to be separately evaluated.[28]

**C. Broadband is a Relevant Element of the Telecommunications Ecosystem**

The Scoping Memo is correct that to understand basic voice services the larger telecommunications ecosystem must also be understood.[29] And broadband services are a key element of that ecosystem. For example, wireline broadband has become increasingly important to California consumers, with about 80% of California households having broadband services.[30] Broadband services provide a platform for a wide variety of services, including basic voice services, but this technical relationship is not the only consideration. Dr. Roycroft testified that wireline voice and broadband are frequently bundled together by wireline carriers.[31] Dr. Aron's testimony on this matter, including the extensive listing of advertised wireline service offerings

[28] Exh 54 (Roycroft June 1), p. 32.
[29] Scoping Memo, p. 2.
[30] Exh. 54 (Roycroft June 1), p. 10.
[31] Exh. 54 (Roycroft June 1), pp. 111-114.

in California,[32] supports Dr. Roycroft's conclusions that the "triple play" of voice, broadband, and video is a major focus of carrier marketing efforts.[33]

Through Dr. Roycroft's testimony, TURN connects the relevance of broadband markets with the data gathering effort of the Commission in this proceeding.[34] Dr. Roycroft provides compelling testimony that the bundling of broadband, voice, and/or video services is a common method carriers use to price discriminate against customers who only need basic service voice or have other needs.[35] Bundled service offerings help carriers segment the market and improve their profits.[36] Carriers can charge excessive rates for stand-alone basic service, while offering implicitly lower voice service prices in bundles. For those customers who cannot afford, or do not want bundles, the higher priced basic voice option is the only option.[37] Thus, the Commission should disregard the argument of carrier witnesses to ignore broadband markets or to focus on mythical 100 kbps broadband service offerings.[38]

*1. Defining broadband markets*

There is no question that broadband technology is appropriately classified as a market separate from voice—a voice connection does not provide a reasonable substitute for a broadband connection. And broadband markets have their own submarkets. For example, Dr. Roycroft emphasizes that fixed and mobile broadband are appropriately categorized as separate

[32] Exh. 5 (Aron June 1), p. 52 and Appendix 1.
[33] Exh. 54 (Roycroft June 1), p. 138.
[34] Dr. Roycroft's testimony stands in contrast to Mr. Gillan's claim during the hearing that none of the testimony tied the evidence of market behavior in the larger "ecosystem" to the issue of just and reasonable rates for basic service voice. RT 67: 12-28.
[35] Exh. 54 (Roycroft June 1), p. 111.
[36] Exh. 54 (Roycroft June 1), p. 111.
[37] Exh. 57 (Roycroft Rebuttal), pp. 31-33.
[38] While Dr. Katz encouraged the Commission to focus on low-speed 100 kbps broadband services Exh. 6, (Katz June 1), p. 25, Dr. Aron's Appendix 1 did not identify any carrier offering such a service in California Exh. 5, (Aron June 1), Appendix 1).

markets and that consumer needs are evolving so that high-speed broadband is displacing low-speed alternatives.[39]

Dr. Roycroft explains that the disparity in functionality between low-speed and high-speed broadband was leading to "one-way" substitution—low-speed broadband services cannot enable the same applications as high-speed broadband.[40] Even AT&T witness Dr. Katz admitted at the hearing that the low-speed broadband theoretically sufficient for over-the-top VoIP service was not a relevant service from the consumer's perspective. "I suspect you are right, most people buying broadband for reasons having nothing to do with voice, much higher speeds [than] you need for voice."[41] Those much higher speeds that "most people" buy are thus distinct from the low speed broadband that Dr. Katz, Dr. Aron, and Mr. Gillan elsewhere argue are sufficient to provide VoIP service.[42]

While TURN has not proposed a bright-line demarcation for advanced or high-quality broadband, the true error is to ignore the demarcation issue entirely, which is the approach taken by carrier witnesses.[43] Dr. Roycroft finds that the FCC's 25/3 Mbps standard is a well-supported and reasonably forward-looking benchmark for considering separate low-speed and high-speed broadband markets.[44] Consumers have fewer available substitutes among alternative wireline broadband providers, in part, because local telephone companies have not followed an investment strategy that allows them to keep pace with the rival cable company's broadband

[39] Exh. 54 (Roycroft June 1), pp. 36-41, 51-56.
[40] Exh. 57 (Roycroft Rebuttal), pp. 51-57.
[41] RT 146: 17-21.
[42] Exh. 5 (Aron June 1 Testimony), p. 32; Exh. 6 (Katz June 1 Testimony), p. 25; Exh. 28 (Gillan June 1 Testimony), p. 14;
[43] Exh. 57 (Roycroft July 15), p. 16.
[44] Exh. 54 (Roycroft June 1), pp. 54-56; *See also*, Exh. 15 (Selwyn March 15), p. 7; Exh. 60 (Blum-Smith March 15).

performance.[45] This fact impacts market definition—it is reasonable to anticipate a growing "one-way substitution" phenomenon for fixed broadband services. Dr. Roycroft references the OECD on the impact of one-way substitution on market definition:

> Asymmetric substitution is also likely to arise with respect to fixed and mobile broadband services, narrowband and broadband services, double- and triple-play offers, and now - with the deployment of NGAs (Next Generation Access Networks) and increasing consumption of high-speed dependent services - between high-speed and regular-speed broadband services. . . the Federal Communications Commission (FCC), the Federal Trade Commission (FTC) and the Department of Justice (DoJ) in the United States have all independently held that residential high speed broadband internet access service constitutes a separate market from narrowband services.[46]

The OECD's acknowledgment of the "increasing consumption of high-speed dependent services" is supported by the growth of multiple connected devices in households that drive demand for bandwidth that is much different than in the era when a household had one "PC" connected to the Internet. Dr. Roycroft illustrats this shift by noting that in 2014, the average number of connected devices per person in the U.S. was estimated to be 2.9, and each of these connected devices is likely to be demanding more bandwidth than the typical PC-based web browsing session of ten years ago.[47] Further, the Internet is now predominantly a video medium, with streaming video making up 70% of downstream Internet traffic in 2015, and the growth of connected devices in the household shows no sign of reversing. The Internet of Things (IoT) is promising to drive connected devices deeper into the basic household infrastructure, with 70% of Internet traffic estimated to be from "non-PC" devices by 2019.[48] These factors indicate that consumer demand for broadband, based on a growing array of necessary services that will run

[45] Exh. 54 (Roycroft June 1), p. 51.
[46] "Defining the Relevant Market in Telecommunications, Review of Selected OECD Countries and Columbia," OECD, 2014, pp. 24-25, emphasis added, footnotes omitted. Quoted in Exh. 54 (Roycroft June 1), p. 52.
[47] Exh. 54 (Roycroft June 1), p. 52.
[48] Exh. 54 (Roycroft June 1), p. 52.

over-the-top of a broadband connection, makes the low-speed broadband offered by telephone companies decidedly inferior to high-speed broadband.[49]

*2. Wireline and wireless broadband services are in separate markets*

Conclusions regarding substitution between wireline and wireless voice services do not carry over to broadband markets. Dr. Roycroft testified that the characteristics of the broadband technology, consumers' use of the technology, and carriers' policies regarding the design of wireless broadband networks all indicate that wireline and wireless broadband services are *complements*.[50] Wireless mobility broadband services have unique mobility characteristics and high metered-usage prices; wireline broadband offers relatively low prices compared to wireless, and can provide high-data speeds. As a result, consumers cannot easily substitute fixed broadband for mobility broadband services, and vice versa.[51]

Mobile devices are designed to seamlessly switch between wireline and wireless broadband networks, and the complementary relationship between mobility and fixed broadband is encouraged by the fact that wireless carriers promote "Wi-Fi offloading." Mobility broadband providers urge their customers to utilize wireline-based broadband through Wi-Fi to better manage their networks. Today, more than 50% of mobility traffic is offloaded onto fixed broadband networks.[52]

Dr. Roycroft also testified that the FCC found fundamental differences between fixed and mobility broadband services:

> When considering mobile broadband, we note there are tradeoffs between speed and mobility. As we have explained in the past, mobile broadband differs from fixed broadband in terms of speed, latency, price and usage allowances, consistency of service throughout an area, and the potential for congestion. Even if we found that the deployment data were reliable, other characteristics of mobile

[49] Exh. 54 (Roycroft June 1), p. 60.
[50] Exh. 54 (Roycroft June 1), pp. 36-43.
[51] Exh. 54 (Roycroft June 1), p. vi.
[52] Exh. 54 (Roycroft June 1), pp. 37-41.

> services, such as latency and usage allowance limits, among other things, would need to be evaluated to determine whether the services "enable users to originate and receive high-quality voice, data, graphics, and video telecommunications.[53]

Because of the complementary relationship and technological differences, the overwhelming majority of consumers do not find wireless mobility broadband alone to be a sufficient broadband service. Of those who do rely on mobility broadband alone, affordability of wireline broadband is identified as a major reason preventing them from adopting both services.[54]

*3. Satellite and fixed wireless broadband are not alternatives to wireline voice or broadband*

The Scoping Memo requested comment on the role of other technologies such as satellite service in defining the relevant market.[55] TURN urges the Commission to find that satellite and fixed wireless broadband technologies do not play a significant role in either voice or broadband markets. Satellite services offer an alternative to consumers where wireline broadband offerings are of either very low quality or not available. Dr. Roycroft testified that while satellite broadband offerings have improved since early deployments, they are relatively low speed when compared to some wireline offerings and are subject to restrictive data caps. For example, HughesNet offers plans with download speeds of either 10 or 15 Mbps, with upload speeds of 1 or 2 Mbps. These plans include data caps of 10, 15, or 20 GB, and range in price from $59.99 to

[53] Exh. 54 (Roycroft June 1), p. 43, quoting *In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, GN Docket No. 14-126, Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment, February 4, 2015, ¶115. *See also*, Exh. 89, (Excerpts from FCC's 18th Report on Wireless Competition), paragraph 155 and RT 79:22-80:16

[54] Exh. 54 (Roycroft June 1), p. 42.

[55] Scoping Memo, Attachment.

$129.99 per month. Given that average household data usage are around 100 GB per month, these caps are very restrictive.[56]

Dr. Topper argues that satellite service provides ubiquitous broadband service that enables VoIP services for all Californians.[57] This is not the case. With regard to voice services, Dr. Roycroft testified that satellite broadband offers a technologically inferior platform.[58] While it is possible that over-the-top (OTT) VoIP could be provided using a satellite broadband connection, a highly-detrimental limit arises due to the fact that the satellites that deliver broadband services are in a geostationary orbit, approximately 23,000 miles above the equator. Thus, VoIP packets will face unavoidable latency associated with the 46,000 mile round trip from the satellite provider's network operation center and the customer's premises. Satellite-based VoIP offered by satellite providers, which have attempted to optimize their network operation centers to minimize additional VoIP packet delay, score poorly in voice call performance. Over-the-top VoIP operating on satellite broadband would most likely perform even worse. The facts of physics prevent satellite from offering a reasonable platform for OTT VoIP.[59]

Dr. Roycroft's testimony regarding fixed wireless services demonstrates that fixed wireless broadband plays a limited role in California telecommunications markets. For large numbers of California households in urban areas, fixed wireless services are simply not available because urban areas are characterized by a highly complex topology that will interfere with the necessary direct line-of-sight to a service provider's antenna.[60] The evidence indicates that this

[56] Exh. 54 (Roycroft June 1), p. 109.
[57] "While very few fixed broadband customers in California choose satellite broadband service, it is available to virtually every person in the state." Exh. 41 (Topper June 1 Testimony), pp. 30-31.
[58] Exh. 57 (Roycroft July 15), p. 22.
[59] Exh. 57 (Roycroft July 15), p. 21-22.
[60] Exh. 54 (Roycroft June 1), p. 105, figure 17.

service is deployed in some rural areas; however, Dr. Roycroft explains that due to pricing and service quality issues, even in rural areas, fixed wireless broadband services are likely to be considered an alternative where the only option is slow DSL or satellite.[61] It is much less likely that consumers in urban areas, assuming that they can establish a line-of-site to the service provider's antenna, will find fixed wireless broadband to be a substitute for wireline alternatives.

**D. Role of Wholesale Services in Market Definition**

Wholesale markets are distinct from retail markets. However, the impact each market has on the other is undeniable and investigation into retail voice markets would be incomplete without an analysis of wholesale services and elements based on aptly defined product and geographic markets.[62] California's wholesale market is a critically important factor in the structure of telecommunications markets, affecting CLECs' and wireless carriers' ability to compete efficiently in retail voice markets.[63] Recognizing this symbiotic relationship, the OII and Scoping Memo both telegraphed the Commission's intent to include a robust analysis of wholesale markets. [64]

In 1996, Congress passed sweeping legislation that was intended, among other things, to open up local telecommunications markets to competition.[65] In the early years after the enactment of the Telecommunications Act, state public utility commissions and the Federal Communications Commission ("FCC") anticipated that new entrants into local markets would

[61] Exh 54 (Roycroft June 1), pp. 105-109.
[62] Exh 53 (Baldwin March 15), p. 15, 26-28; Exh 56 (Baldwin July 15), p. 8.
[63] Exh. 55 (Baldwin June 1), pp. 7-14.
[64] See, e.g., OII question Nos. 13, 14, 15, 16, and 18; and Scoping Memo at 1.b.iii. 2.a.iv, 2.b.iv, and 3.c.
[65] Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (Feb. 8, 1996).

rely on ILECs' wholesale unbundled facilities to offer residential customers an alternative to the ILECs' retail residential voice services.[66]

As Ms. Baldwin explains in her opening March 15 testimony, vestiges of the wholesale and unbundling policies still exist.[67] CLEC and wireless retail competition (other than by cable companies, who have their own local infrastructure) still depends on access to wholesale services, including unbundled loops, unbundled loop platforms, resale, other forms of last-mile access, and special access services. As TURN demonstrates in its testimony, ILECs are the primary (and in many geographic markets the sole) providers of these wholesale services that CLECs and wireless carriers, in turn use to directly compete with those ILECs. Therefore, the rates, terms, and conditions of these wholesale network elements and services directly affect the viability and profitability of the CLECs' entry into markets that have been traditionally served by ILECs. If, for example, ILECs charge more for a wholesale service than it charges for its corresponding retail service, this "price squeeze" will deter competitive entry. If, instead, pricing signals accurately convey information about the ILECs' cost of providing the wholesale elements and if the wholesale services are provided at reasonable terms and conditions, then efficient competition can evolve.[68]

Despite the significance of wholesale markets behavior, ILECs and cable Respondents rely on generalities to address the OII's questions. Cable witness Dr. Topper, for example, provides only a broad-brush analysis of the impact of ILEC special access and the assertion that carriers have competitive alternatives.[69] In another example, AT&T witness Dr. Aron includes a

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[66] OII, page 3 (citing D.06-08-030, p. 132, 263-264.) *See also*, The FCC's Local Competition Order *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, CC Docket No. 96-98, First Report and Order, 11 FCC Rcd 15499 (1996) at para. 12.
[67] Exh. 53 (Baldwin March 15), pp. 18-19.
[68] Exh. 53 (Baldwin March 15), pp. 18-19.
[69] Exh. 42 (Topper June 1), pp. 43-48.

table summarizing the offerings of various providers of wholesale inputs that is vague and over-inclusive and should be afforded little weight.[70] From this laundry list, it is impossible to understand whether the terms and conditions offered by the wholesale carriers are reasonable and do not create a price squeeze. Also, Dr. Aron's attempt to portray the competitive carriers service territories merely demonstrates the spotty geographic coverage of many of these providers. As the FCC has found, and as corroborated by carrier data responses in this proceeding, although competitive providers may offer *some* wholesale inputs in *some* geographic markets, in the vast majority of instances, providers such as wireless carriers and CLECs rely on ILECs for wholesale services.[71]

Somewhat paradoxically, the significance of the wholesale market to the Commission's assessment of competition in residential markets lies in the fact that competitive entry using ILEC wholesale services and facilities has *not* been successful. The lack of meaningful competition that relies on wholesale elements means there are fewer competitors creating pressure that would yield just and reasonable rates for basic residential phone service. As Ms. Baldwin testified, "it's crystal clear that one cannot rely on wholesale-based competition as a way to constrain the rates of basic local exchange service."[72]

Special access services are also critically important sources of secure, reliable point-to-point dedicated circuits that allow for the transmission of large volumes of telecommunications

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[70] Exh. 5 (Aron June 1), pp. 53-56.

[71] Exh. 55 (Baldwin June 1), pp. 7, 9, Confidential Exhibit SMB-1, pp. 6-7. Also, as Ms. Baldwin observed, the comprehensive and detailed data that the FCC has gathered in its special access proceeding (Docket WC 05- 25) shows that ILECs dominate these wholesale markets (as well as retail markets) and that CLECs serve only a small portion of this wholesale market. Exh. 53 (Baldwin March 15), p. 20 citing *Special Access for Price Cap Local Exchange Carriers; AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, WC Docket No. 05-25, RM-10593, Order and Further Notice of Proposed Rulemaking, 27 FCC Rcd 16318 (2012).

[72] RT 132: 2-6.

traffic. CLECs, wireless carriers, and large end users (e.g., government agencies and large businesses) purchase special access services, primarily from ILECs.[73] Ms. Baldwin notes the significance of these wholesale services to competition and notes the FCC found special access to be an "important building bock" for all types of customers, including banks, wireless companies, gas stations, hospitals and government agencies and that special access is a "critical input" for carriers to offer advanced services to end users.[74]

Other witnesses concur with Ms. Baldwin's assessment of special access services as an important aspect of the telecommunications ecosystem. For example CALTEL's witness Ms. DeYoung states that, "there is no question that this wholesale input [special access] is of vital importance to all types of telecommunications carriers, including CLECs."[75] Sprint's witness Mr. Burt notes that, "Retail providers like Sprint are dependent on wholesale inputs to some degree in most cases and in some cases they are totally dependent." And specifically for special access he states, "As indicated above, BDS is critical for wireless cell site backhaul and for access to customer premises."[76]

The wholesale market, and in particular special access services, represents a significant contribution to the overall economy of the California and should be a priority for this Commission. Extrapolating based on the population of California, Ms. Baldwin estimates that the combined ILEC-CLEC special access services market approximates $5.5 billion.[77] Although many of these dollars are jurisdictionally interstate, this sizeable market segment reflects a

[73] Exh. 55 (Baldwin June 1), pp. 7-14
[74] Exh. 55 (Baldwin June 1), p. 7-14, citing WC Docket No. 16-143, et al*., Business Data Services in an Internet Protocol Environment, et al.,* Tariff Investigation Order and Further Notice of Proposed Rulemaking, FCC 16-54 (rel. May 2, 2016) ("FCC Business Data Services FNPRM"), at paras. 12-13, cites omitted.
[75] Exh. 24 (DeYoung July 15), p. 6.
[76] Exh. 78 (Burt June 1), pp. 7, 8, 12, 16.
[77] Exh. 55 (Baldwin June 1), p. 28.

substantial cost driver for CLECs and wireless carriers that rely on special access services as an "input" to the retail services that they sell in competition with ILECs.[78] Given the direct correlation to pricing of retail services, it is important that the Commission understand whether wholesale inputs are priced efficiently and fairly so that wholesale-based competition can evolve.

**E. Further Perspectives on Market Definition**

*1. Technology-only definitions are not appropriate*

The Scoping Memo Outline asks whether markets should be defined by technology. Bright-line market boundaries cannot always be defined by technology, thus defining markets by technology alone is not advised. For example, Dr. Roycroft states that traditional TDM switching-based wireline services and wireline VoIP services are best treated as being part of the market for wireline voice services—there is no need to further parse the voice market by whether the service is based on the TDM platform or the VoIP platform.[79]

Dr. Aron agrees with Dr. Roycroft's assessment. "I agree with him that a reasonable analysis of competition for voice services customers must combine circuit switched wireline voice service and VoIP voice service, and that not doing so improperly inflates the HHI."[80]

With regard to "intermodal competition," Dr. Roycroft testified that the potential for intermodal alternatives must be carefully evaluated when defining markets.[81] The Communications Division Market Share Report, as discussed more fully below, is based on the proposition that there is symmetric substitution between mobility and wireline voice services, and between mobility and wireline broadband services thus creating "intermodal" voice and

[78] Exh. 55 (Baldwin June 1), p. 28.
[79] Exh. 54 (Roycroft June 1), pp. 79-80.
[80] Rebuttal Testimony of Dr. Debra J. Aron on Behalf of AT&T California (U 1001 C), July 15, 2016, Exh. 7, pp. 14-15.
[81] Exh. 54 (Roycroft June 1), p. 23.

broadband markets. This is not a supportable conclusion.[82] Dr. Roycroft's analysis finds that in light of numerous findings that mobility markets are separate, and the "one-way substitution," that characterizes mobility and fixed voice services, an intermodal voice market is not appropriately considered in that report.[83] Similarly, with regard to broadband services, as discussed above, wireline and mobility broadband services exhibit a complementary relationship, which is encouraged by wireless carriers, wireless handsets, and the much higher prices for mobility broadband data plans.[84] Before a concentration or HHI analysis should be applied, the market must be correctly defined beyond reliance on simple technology platforms.

*2. Residential and business markets are different*

The Scoping Memo also raises issues associated with whether it is appropriate to consider business and residential markets separately. Both TURN witnesses explain that the wireline business market faces more competition than the residential market.[85] This position was also supported by Frontier and Consolidated, stating that "competition for business customers is particularly intense because businesses need to purchase more telecommunications services than average residential customers. The potential to generate more revenues can attract additional competitors, particularly CLECs, as many CLECs specifically target the business community."[86]

Ms. Baldwin states that it is essential to analyze wholesale services and elements based on aptly defined product and geographic markets and that the Commission properly recognized the differences between residence and business customers when it requested data for wholesale

[82] Exh. 54 (Roycroft June 1), p. 35.
[83] Exh 54 (Roycroft June 1), pp. 30-32.
[84] Exh. 54 (Roycroft June 1), pp. 36-43.
[85] Exh. 54 (Roycroft June 1), p. 95, lines 1-5; Exh. 57 (Roycroft July 15), p. 30; Exh. 55 (Baldwin June 1), p. 25 (FCC statistics should overwhelming number of non-ILEC lines serve business.
[86] Consolidated's Supplemental Responses to Information Requests, June 1, 2016, p. 9, lines 15-17; Frontier's Supplemental Responses to Information Requests, p. 10, lines 6-9.

services to be broken down into distinct business and residence categories.[87] Moreover, Ms. Baldwin provides FCC data that demonstrates that 82% of the total non-ILEC switched access lines are classified as business and government, suggesting CLECs are primarily serving business customers and only a small percentage of the retail market.[88]

*3. Geography separates markets*

The Scoping Memo asks whether markets should be defined by geography. TURN's witness testified that geography is essential to consider when evaluating telecommunication markets. Wireline services (both ILEC and cable) are provided based on the legacy of franchise grants, and consumers face market choices that are based on the location of their residence.[89] While wireless mobility services are less geographically constrained from the consumers' perspective, geography again plays a role in considering market competition. Wireless carriers have not invested in rural areas to the same extent that they have in urban areas thus limiting the ability to seamlessly substitute wireless for wireline in those areas. Similarly, geographic factors related to terrain, foliage, and weather may also affect wireless service performance, and may make it more difficult for consumers to choose to rely exclusively on wireless services.[90] Dr. Aron also recognizes the geographic elements of the market. In presenting information regarding service offerings that reflected consumer choices, Dr. Aron categorizes options by cable service areas, reflecting the obvious geographic differences in the market.[91]

As discussed below, when considering how to measure the market, Ms. Baldwin also emphasizes the value of reporting wholesale data on a more granular level due to the geographic disparities and spotty coverage of many wholesale providers, in addition to the reliance on

[87] Exh. 53 (Baldwin March 15), p. 19.
[88] Exh. 55 (Baldwin June 1), p. 25.
[89] Exh. 54 (Roycroft June 1), p. 27.
[90] Exh 54. (Roycroft June 1), p. 27.
[91] Exh. 5 (Aron, June 1), pp. 43-51 and Appendix 1. See also, the discussion provided in Exh. 57 (Roycroft Rebuttal), p. 28.

geographically isolated ILEC serving areas.[92] Thus, with regard to the role of geography in market definition, the Commission must recognize that geography plays a key role, and incorporate geographic factors into a market analysis.

*4. Demographics affects market definition and market outcomes*

Demographics are a key element for the proper definition of relevant markets. To demonstrate this link, Dr. Roycroft utilizes a regression analysis to evaluate the demographic characteristics of cord cutters.[93] Dr. Roycroft finds that characteristics such as higher income, home ownership, marriage, and higher age groups decrease the chances of a household being wireless only. On the other hand, demographic factors associated with household poverty, Hispanic origin, and female household heads increase the probability of wireless-only service. Dr. Roycroft's analysis demonstrates that these relationships were statistically significant, which rebutted the proposition espoused by Dr. Aron,[94] Dr. Topper,[95] and Mr. Gillan,[96] that all households find wireless-only to be a reasonable alternative. If all households found wireless service to be an equivalent to wireline voice, these statistically significant relationships would not be observed.[97]

Witnesses representing other intervenors such as Greenlining and the Center for Accessible Technology also emphasize the unique needs of key demographic groups in California and encourage the Commission to specifically investigate whether these populations have equivalent competitive alternatives compared to larger and more homogenous groups.[98]

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[92] Exh. 56 (Baldwin July 15), p. 8; See also, Exh. 53 (Baldwin March 15), p. 15 (special access market) and p. 19 (last mile analysis of wholesale competition).
[93] Exh. 54 (Roycroft June 1), 33-35.
[94] Exh. 5 (Aron, June 1), p. 20.
[95] Exh. 41 (Topper June 1), p. 17.
[96] Exh. 28 (Gillan June 1), pp. 9-11.
[97] Exh. 54 (Roycroft June 1), pp. 33-35.
[98] Exh. 71 (Goodman June 1), p. 4-5; Exh. 65 (Kasnitz June 1), p. 4-6.

As discussed above, the record supports the proposition that there *is not* "one big market" for all telecommunications services in California. Rather, economic theory and tools identify consumer choice and substitution as the foundation for market definition. There is evidence that consumers face limits on their ability to substitute between telecommunications services, and those limits result in boundaries between markets. Consumers cannot substitute fixed services for mobility services, voice services for broadband services, or one incumbent carrier for another. While one-way substitution exists for some services, the one-way substitution implies a separation between the services that appropriately implies separate markets. Similarly, geographic boundaries must be recognized, or competition will be overstated, not only due to the technical limitations of certain technologies, but also the unwillingness of incumbent cable and wireline carriers to serve outside of their historic territories. Demographic factors also play a role in determining the potential for substitution. Some consumers do not want, or cannot afford, service bundles or other high-priced services. Similarly, some consumers find cord cutting to be undesirable due to personal characteristics, or the need to utilize services that run over-the-top of a wireline connection. Moreover, the Commission must consider the impact of wholesale market concentration on retail rates and acknowledge the fact that a CLEC may offer special access services to a particular building in a certain city does not alter the fact that in the preponderance of instances ILECs are the sole suppliers of special access services. Consideration of all of these factors contributes to the appropriate definition of the market and, as TURN's witnesses demonstrate, the confluence of economic, geographic, and demographic factors supports the proposition that separate markets exist for fixed and mobility voice services, and for fixed and mobility broadband services.

## III. MEASURING THE MARKET

### A. Service Deployment

Dr. Roycroft conducted a detailed study of deployment and service availability for wireline voice, fixed broadband, and wireless voice and broadband services. No party rebutted the results of this study nor did any Respondent attempt to provide a similar data-driven analysis.

The study evaluated options for wireline voice and broadband services, based on Census Block analysis, using publicly available Form 477 data, for June 2015. The level of geographic granularity was critical to the efficacy of the study. The fact that multiple carriers-- cable companies, wireless and incumbent wireline carriers-- may operate in California does not imply that consumers have the ability to choose from all of operators. These providers are generally constrained to certain geographic areas, having a profound impact on the ability of consumers to find alternatives to basic service.[99]

The study identifies the options that consumers have among facilities-based voice and broadband providers. Facilities-based providers include ILECs and cable companies, as well as CLECs that utilize UNEs. Carrier web sites confirmed that all facilities-based providers identified in the study sell wireline voice and broadband services. Because consumers must have a broadband service to utilize over-the-top ("OTT") VoIP services, the study also reflects options available to access non-bundled OTT VoIP services that can be delivered over a broadband connection.[100]

Dr. Roycroft used the Census Block information to evaluate the number of options consumers have in California's 15 largest counties, and two additional less populated counties. Combined, these counties have about 83.5% of the state's population. The results of this analysis show that in most geographic markets consumers have a limited number of options for wireline

[99] Exh. 54 (Roycroft June 1), p. 45-46.
[100] Exh. 54 (Roycroft June 1), p. 46.

voice and broadband services, which raises red flags regarding the existence of market power.[101] Dr. Roycroft provided maps that enabled the visualization of the data.[102]

With regard to the deployment of wireline voice and broadband service providers, Dr. Roycroft shows that within the combined study areas 76.4% of households have two choices of wireline voice and broadband service provider. Table 1, below, shows the summary of choices by county, those counties where the majority of households have two choices (duopoly market) are highlighted in yellow.

| **Choices of Wireline Broadband (Any Speed) and Voice Provider** | | | | | | |
|---|---|---|---|---|---|---|
| **County** | **No Provider** | **One Provider** | **Two Providers** | **Three Providers** | **Four Providers** | **Five Providers** |
| Alameda | 1.23% | 2.44% | 58.21% | 38.12% | 0.00% | 0.00% |
| Contra Costa | 1.94% | 2.07% | 63.34% | 28.20% | 4.46% | 0.00% |
| Fresno | 5.61% | 12.10% | 82.28% | 0.01% | 0.00% | 0.00% |
| Humboldt | 18.84% | 11.51% | 69.34% | 0.31% | 0.00% | 0.00% |
| Kern | 5.84% | 14.42% | 79.74% | 0.00% | 0.00% | 0.00% |
| Los Angeles | 0.28% | 3.24% | 78.82% | 15.82% | 1.72% | 0.12% |
| Orange | 1.40% | 5.74% | 87.86% | 4.89% | 0.12% | 0.00% |
| Riverside | 2.61% | 6.47% | 90.81% | 0.12% | 0.00% | 0.00% |
| Sacramento | 2.45% | 4.52% | 64.43% | 27.26% | 1.34% | 0.00% |
| San Bernardino | 3.85% | 10.60% | 83.00% | 2.55% | 0.00% | 0.00% |
| San Diego | 2.90% | 3.68% | 90.35% | 3.06% | 0.00% | 0.00% |
| San Francisco | 1.99% | 0.18% | 9.10% | 40.79% | 37.68% | 10.26% |
| San Joaquin | 4.22% | 5.77% | 89.98% | 0.03% | 0.00% | 0.00% |
| San Mateo | 2.22% | 2.02% | 41.42% | 33.63% | 17.53% | 3.19% |
| Santa Clara | 2.86% | 4.86% | 67.97% | 24.13% | 0.18% | 0.00% |
| Shasta | 8.53% | 20.19% | 71.28% | 0.00% | 0.00% | 0.00% |

[101] Exh. 54 (Roycroft June 1), p. 83.
[102] Exh. 54 (Roycroft June 1), pp. 46-49 and Appendix A.

| Choices of Wireline Broadband (Any Speed) and Voice Provider | | | | | | |
|---|---|---|---|---|---|---|
| **County** | **No Provider** | **One Provider** | **Two Providers** | **Three Providers** | **Four Providers** | **Five Providers** |
| Ventura | 1.18% | 5.71% | 93.07% | 0.04% | 0.00% | 0.00% |

San Francisco, highlighted in blue, is the lone exception to the duopoly market that is the general rule in the other counties, with over 80% of San Francisco households having a choice from among three or more providers. Dr. Roycroft notes that unique conditions in San Francisco County illustrate factors that contribute to the potential for more choice: high population density, high income (third-highest-income county in the state, at $83,788), short copper loops, and another carrier that has over-built ILEC and cable facilities.[103]

TURN's witness also notes that in the more rural counties included in the study (Shasta, Humboldt, and Kern), wireline broadband has a more limited reach. A substantial number of households in these counties either face wireline broadband monopolies or have no access to wireline broadband. For example, in Humboldt and Shasta counties, about 30% of households have either no wireline broadband or face wireline broadband monopolies. For Kern County, about 20% face similar circumstances.[104]

With regard to fixed wireless services, Dr. Roycroft's study of Form 477 data finds that urban areas were not well-covered by the service, while rural areas of the state are much more likely to have fixed wireless service available. Fixed wireless services are not widely deployed in urban areas because of limitations of the fixed wireless technology in densely populated or hilly areas, there are simply too many obstructions that would interfere with the deployment of a

[103] Exh. 54 (Roycroft June 1), p. 49.
[104] Exh. 54 (Roycroft June 1), p. 51.

fixed wireless broadband network.[105] Because the overwhelming majority of Dr. Roycroft's study focuses on urban areas, he does not include fixed wireless as a potential alternative.[106] However, Dr. Roycroft notes that even in rural areas, the impact of fixed wireless services on consumer choice is necessarily more muted than wireline alternatives. Because of the low quality of the spectrum used, and the need for a line-of-sight to the service provider's antenna, the presence of a fixed wireless service provider alone says nothing about a consumer's ability to choose that provider. Residences need to be individually qualified as to whether they met the technical requirements associated with fixed wireless service.[107]

Figure 1, below, demonstrates that fixed (wireless) broadband offerings at any speed are missing from major population centers, especially in the southern portion of the state.[108]

[105] Exh. 54 (Roycroft June 1), p. 106, Reports of fixed wireless services in some urban areas, such as Sacramento and Santa Clara Counties appear to be exaggerated and websites indicate severe service restrictions in these areas.
[106] Exh. 54 (Roycroft June 1), p. 108.
[107] Exh. 54 (Roycroft June 1), p. 108.
[108] Exh. 54 (Roycroft June 1), p. 105.

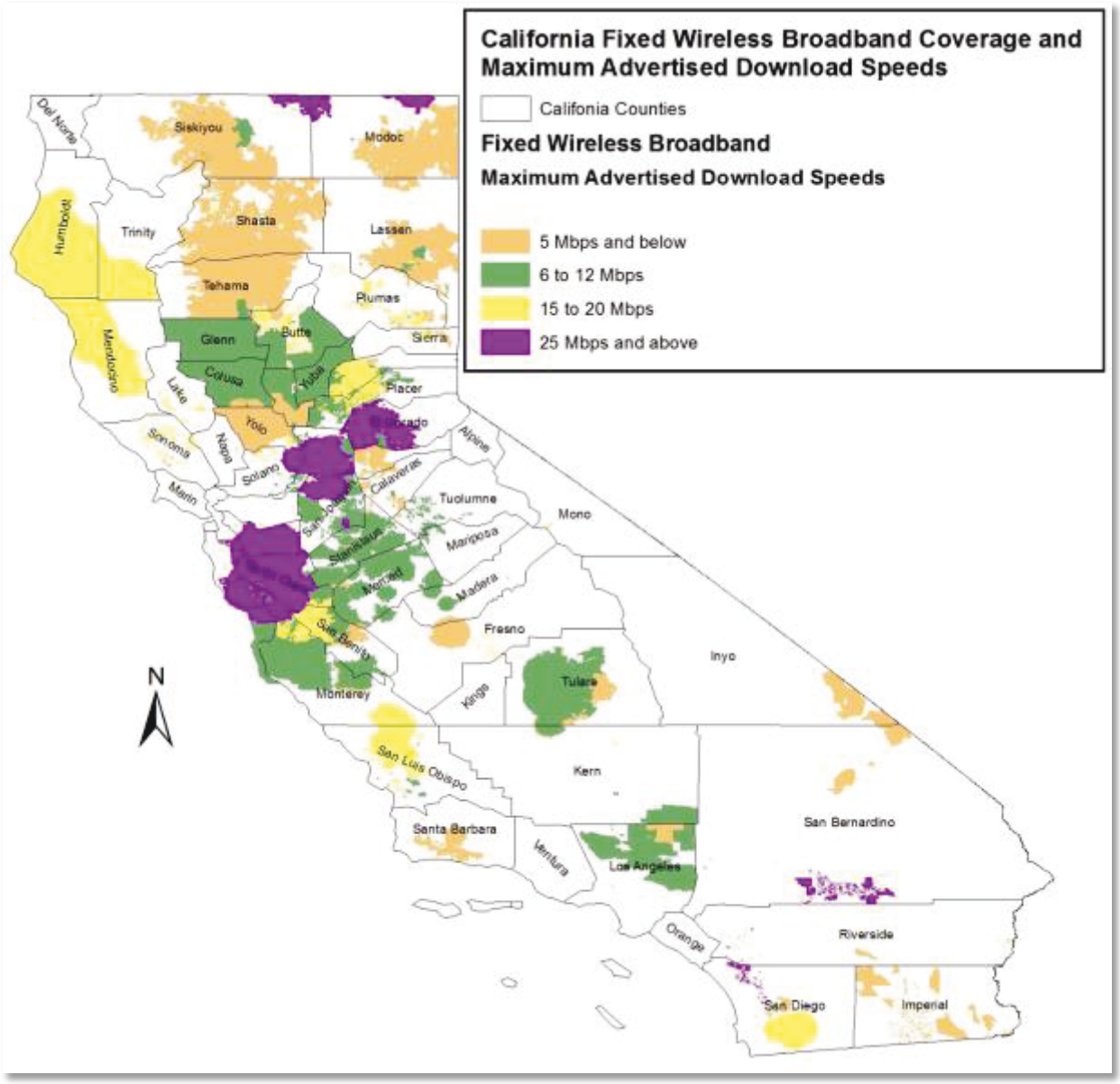


*Figure 1: Fixed Wireless Broadband Coverage Areas and Maximum Download Speeds (Figure 17 from Exh 54 (Roycroft Opening))*

TURN's witness also considered the deployment of satellite service. Dr. Roycroft testified that satellite services offer an alternative to consumers where wireline broadband offerings are of either very low quality or not available.[109] He observes that while satellite broadband offerings have improved since early deployments, they are relatively low speed when

[109] Exh. 54 (Roycroft June 1), p. 109.

compared to some wireline offerings, and are subject to restrictive data caps. Dr. Roycroft finds that satellite data caps ranged from 10 GB to 20 GB, and in light of the fact that average household data usage are around 100 GB per month, these caps are very restrictive.[110] Dr. Roycroft also testified that satellite services may suffer from network latency or be impacted by weather conditions degrading service quality for voice and Internet applications and making the service inferior to wireline broadband.[111]

Dr. Roycroft concludes that, as was the case with fixed wireless offerings, satellite broadband services are not a reasonable alternative, and are not appropriately considered as being in the same market, as wireline broadband services, and do not present a check on market power in the broadband market.[112]

With regard to wireless mobility voice and broadband services, TURN's witness finds that service availability was widespread, but that rural areas were more likely to face limits on coverage.[113] Dr. Roycroft also finds that the four national wireless mobility providers, AT&T Mobility, Verizon Wireless, Sprint, and T-Mobile, all operate in the state, as do wireless resellers (or MVNOs).[114] Wireless coverage varies by geography, and wireless signals may be weak in some areas, preventing in-home (or even outdoor) calling.[115]

**B. Metrics for Measuring Competition and Evaluating whether Rates are Just and Reasonable**

When measuring market outcomes, there are many pieces to the puzzle. While no single piece reveals the whole picture, market share and market concentration are recognized by economists as delivering key information about the nature of a market, and reflect important

[110] Exh. 54 (Roycroft June 1), p. 109.
[111] Exh. 54 (Roycroft June 1), p. 109-110.
[112] Exh. 54 (Roycroft June 1), p. 110.
[113] Exh. 54 (Roycroft June 1), pp. xiii and 21.
[114] Exh. 54 (Roycroft June 1), p. 65.
[115] Exh. 54 (Roycroft June 1), p. 21.

information regarding the ability of consumers to choose. However, the Commission, applying its administrative expertise, should assess various indicators of whether there is sufficient competition to yield just and reasonable rates for retail voice services.[116] With regard to the key question of whether basic voice service rates are just and reasonable, the Commission should not rely on the availability of wireless mobility services or voice offered as part of a bundled package as a barometer of just and reasonable rates for stand-alone basic telephone service, nor should it rely on evidence of wireless cord cutting to conclude that all households have a "choice" (that is really a Hobson's choice), nor should it rely on speculation about potential competition. As discussed below, for many of these metrics, there is sufficient information in this proceeding regarding various indicators of competition for the Commission to find that market forces are not sufficient to yield just and reasonable rates.

*1. Market share and market concentration*

Dr. Roycroft testified that evaluating market share and market concentration analysis, such as that completed through the application of the Herfindahl-Hirschman Index (HHI) or concentration ratios, is an important element of a complete market analysis. He emphasizes that market share and market concentration is one element of an overall evaluation of markets, and that it is reasonable to consider market concentration measures in the context of bright-line benchmarks, such as those offered by the *Horizontal Merger Guidelines*.[117]

Ms. Baldwin agrees that market share is just one of several metrics necessary for a complete competition analysis in either the wholesale or retail markets.[118] As TURN's witness Ms. Baldwin explains:

> The most useful and reliable metric of competition is market concentration (as shown by market share), which reflects consumers' actual

[116] Exh. 53 (Baldwin March 15), at 24-36.
[117] Exh. 57 (Roycroft Rebuttal), p. 12.
[118] Exh. 53 (Baldwin March 15), pp. 3-4

> purchasing decisions. The Commission's OII appropriately seeks data from ILECs and CLECs regarding line counts and customer counts (see OII Question Nos. 2, 3, 5, and 6). The carriers' responses to the Commission's questions will enable parties to this proceeding and the Commission to compute market concentration in well-defined voice and broadband Internet access markets. Question No. 14, which concerns the wholesale market, will enable the Commission to gauge the degree to which CLECs' entry (as measured by market share) relies on ILEC-provided wholesale elements. I also identify various "secondary" metrics that the Commission can use to supplement the monitoring of relevant markets going forward and discuss these other indicators of competition in my response to Question No. 22. In sum, although a wide array of metrics can inform the Commission, the essential metric is market share as applied to relevant geographic and product markets.[119]

Similarly, Frontier, Consolidated, and Sprint all point to the Communication Division's Market Share report as containing data that can be probative and valuable.[120] Mr. Gillan, testifying on behalf of Cox, also points to market share information as a valuable contribution to understanding market conditions. For example, Mr. Gillan uses market share information to conclude that ILECs continue to have an advantage in business markets, as opposed to residential markets: "Moreover, incumbent local telephone companies have not experienced the same reduction in market share in the business market as they have in the residential market."[121]

Dr. Topper, provides contradictory testimony when he states that, "there is no clear relationship between market shares or changes in concentration and the strength of competition"[122] and yet, in order to explain the impact of competition on ILECs, he relies on market share information. For example, he states, "Traditional wireline voice services are under

[119] Exh. 53 (Baldwin March 15), pp. 6-8.
[120] Supplemental Responses of Respondents Consolidated Communications of California Company (U 1015 C) Consolidated Communications Enterprise Services aka Surewest Televideo (U 7261 C) To Information Requests, Served On June 1, 2016, Exhibit 69, p. 3. Supplemental Responses of Respondents Citizens Telecommunications Company of California (U 1024 C) Frontier California Inc. (U 1002 C) Frontier Communications Testimony of Sprint Telephony PCS, L.P. (In Response to CPUC Initial Information Requests In I.15-11-007), JUNE 1, 2016, Exhibit 78, pp. 2-3.of the Southwest Inc. (U 1026 C) To Information Requests, June 1, 2016, Exhibit 13, p. 5;
[121] Exh. 28 (Gillan June 1), p. 25.
[122] Exh. 41 (Topper June 1), p. 34.

tremendous competitive pressure from intra- and inter-modal choices, and have steadily been losing market share to those options over the last decade."[123] He also notes, "These alternatives [to ILEC services] have steadily been eroding the market share of traditional wireline voice service."[124] Finally, he states, "VoIP providers and CLECs took market share from ILECs."[125] Dr. Topper apparently wants to have it both ways, dismissing market share as a concept, but using market share to support his positions regarding the state of competition.

Dr. Roycroft notes that AT&T witness Dr. Katz was generally dismissive of market share analysis through the use of concentration measures.[126] However, Dr. Roycroft also notes that Dr. Katz crafts his discussion with modifiers that suggest that he is only opposed to market evaluations that rely solely on market concentration: "several problems . . . can arise from an excessive reliance on concentration calculations"; "there is no single measure that accurately relates to the degree of competition in all markets"; "there is no catch-all theory that relates the strength and nature of competition to market shares and concentration, or to changes in concentration."[127] These statements by Dr. Katz indicate that he agrees market share can play an important role in the evaluation of markets. Indeed, Dr. Katz had relied on market share, market concentration, and the *Horizontal Merger Guidelines* bright-line boundaries associated with market concentration in other proceedings.[128] In conclusion, there is no question, as testified to by Dr. Roycroft, that market share and concentration analysis provide important insights into the nature of markets, and the potential for effective competition. The Commission should adopt Dr.

[123] Exh. 41 (Topper June 1), p. 5.
[124] Exh. 41 (Topper June 1), p. 5.
[125] Exh. 41 (Topper June 1), p. 36.
[126] Exh. 54 (Roycroft June 1), p. 22.
[127] Exh. 54 (Roycroft June 1), p. 22, citing to Exh 1.5 (Katz March 15)..
[128] Exh. 57, (Roycroft Rebuttal), pp. 11-12.

Roycroft's recommendation that the Commission consider market concentration as one component of its overall evaluation of market conditions in California.[129]

*2. Importance of granular data to measure and analyze markets*

Policy-making is best conducted when it is based on comprehensive and timely information. The FCC's public reports on local telephone competition and its report on broadband Internet access competition, though useful references, are necessarily more outdated than the information in the Form 477s that carriers submit to the FCC.[130] The FCC's public data, upon which many carriers would prefer the Commission rely in isolation, excludes important information that can contribute to informed policy-making. Carriers should file their Form 477s with the CPUC simultaneously with their submission to the FCC so that the CPUC has the most up-to-date information available.[131] While the carriers have resisted giving Form 477 data to other parties in this proceeding, there is no question that the Commission should have access to this data pursuant to their own regulatory mandates, data gathering authority and subpoena power. Federal telecommunications policy has a long history of recognizing the shared authority between state and federal regulators, including the role of state commissions to encourage competition and access to advanced services.[132] While state commissions should have the authority to request the same data from carriers, including granular subscription data, that appears on the Form 477 for their own states, regulatory efficiency suggests that the carriers should provide the state-specific Form 477 material.

As discussed above, market share data is instructive as a gauge for competition in relevant markets.[133] In addition, on an ongoing basis, any wholesale data that the Commission

[129] Exh. 54 (Roycroft June 1), pp. 21-22.
[130] Exh. 56 (Baldwin July 15) at 2. See also Ex. 53 (Baldwin March 15), at 11-12, 27-28.
[131] Exh. 56 (Baldwin July 15) at 2. See also RT 59: 2-3 (Roycroft).
[132] Exh. 56 (Baldwin July 15), p. 29. Exh. 54 (Roycroft June 1), p. xv, 132.
[133] Exh. 53 (Baldwin March 15), at pp. 7-8.

collects, including special access data, should be provided not only for a carrier's entire aggregated service area, but also disaggregated geographically because markets evolve differently in, for example, urban markets relative to rural ones.[134]

Broadband Internet access is an integral element of the telecommunication ecosystem. As TURN witness Ms. Baldwin explaines, broadband Internet access service not only provides an alternative platform for offering voice telephone service, but is, on its own, an essential service[135] and an important element of the "ecosystem." For example, the speeds of the broadband Internet access options-within the relevant geographic market for any given consumer who is seeking to purchase a bundled offering- indirectly affects the consumer's decision regarding her provider for voice service. The consumer's broadband speed requirement may dictate the consumer's provider of voice service.[136] Therefore, the CPUC should gather detailed data about broadband deployment and subscriptions by speed.

The CPUC appropriately directed carriers to provide wholesale data separately for residence and business customers. However, OII Information Request No. 14 failed to request carriers to submit data at a geographic level that is sufficiently granular to analyze competition meaningfully in relevant markets. Relevant geographic markets are much smaller than the ILECs' entire footprint within the state.

As Ms. Baldwin explaines, the data provided in response to the OII Information Request No. 14 would "blend the characteristics of markets such as those in San Francisco with the characteristics of markets in Weaverville," and therefore, "[b]ecause the relatively large numbers of customers in cities obscures the negligible numbers in sparsely populated areas, it would not

[134] Exh. 53(Baldwin March 15), at p. 23.
[135] *United States Telecom Ass'n v. FCC*, D.C. Cir. Case No. 15-1063, (June 14, 2016) (upholding the FCC's classification as a telecommunications service).
[136] Exh. 56 (Baldwin July 15), p. 5; RT 143: 26 – 144: 8.

be appropriate to deduce that the footprint-wide numbers are representative of all communities."[137] For this reason, TURN sought geographically disaggregated wholesale data, with limited success. Of the two largest carriers, Frontier provided data at the wire center level, but AT&T stated that data was not available at that level of detail.[138] The Commission should further investigate the availability of granular wholesale data because such data provides a solid foundation for the Commission to monitor wholesale markets that vary by geography and demographics.[139]

Also, the CPUC should continue to seek backhaul data from ILECs and wireless carriers so that it can monitor the wireless industry's reliance on ILECs' wholesale services and the related impacts on prices for both wireless and wireline services. During the hearing, the Administrative Law Judge appeared to acknowledge this critical lynchpin for meaningful competitive alternatives when it pressed AT&T for its share of the backhaul market.[140] Specifically, the CPUC should routinely seek the following information: (1) the relative percentages and volumes (measured either by revenue or by numbers of circuits) of intrastate versus interstate special access circuits sold by ILECs to (a) their own affiliates (e.g., AT&T California to AT&T Wireless) and (b) competing carriers; (2) the relative percentages and volumes of intrastate and interstate special access services purchased by non-ILECs from (a) ILECs and (b) non-ILECs; and (3) the total volumes of intrastate special access (measured either by revenue or numbers of circuits sold and purchased).

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[137] Exh. 53 (Baldwin March 15), p. 20

[138] See, e.g., TURN-25 and TURN-30). (In response to TURN's discovery, Frontier provided data at the wire center level, and AT&T did not. See Exh. 55 (Baldwin June 1), Confidential Exhibits SMB-4 (AT&T's response to TURN-25), SMB-5 (AT&T's response to TURN-30), and SMB-8 (Frontier's response to TURN-25).

[139] Exh. 53(Baldwin March 15), p. 23.

[140] Exh. 55 (Baldwin June 1), pp. 12-13; RT 134: 7-17.

*3. Key metrics that contribute to the big picture*

While market share and market concentration are important elements of a competition analysis that must be supported by comprehensive and granular data, it is only part of the bigger picture. There are many other metrics and barometers of competition.

*Evidence of price increases or service quality deterioration being caused by corporate strategy:* Price increases and poor service quality can serve as a barometer for measuring the level of competition.[141] For example, an ILEC may seek, in the pursuit of corporate objectives, to encourage customers to migrate from unmetered wireline services to metered wireless services. They can achieve this objective by discouraging purchase of the wireline service either by raising wireline prices or failing to maintain the wireline network.

The Commission appropriately sought data regarding price changes in basic voice services since January 1, 2011 in its Question Nos. 4 and 8. If there are no changes in the cost of supply, price increases could suggest a lack of competition. AT&T witness, Dr. Katz, asserts erroneously that Ms. Baldwin failed to provide evidence of price increases.[142] However, TURN witnesses provide evidence of price increases in discretionary features and basic local service.[143]

Deteriorating service quality also signals a potential lack of competition that, in turn, suggests pressure will not be sufficient to yield just and reasonable rates. Dr. Katz disagrees, suggesting that service quality is not a, "sound measure of competition," and that economic theory does not find an inverse relationship between service quality and competition and urges the Commission to ignore deteriorating conditions in its analysis.[144] Ms. Baldwin demonstrates why the Commission should reject AT&T's attempt to ignore service quality and how selective

[141] Exh. 53 (Baldwin March 15), pp. 31-33.
[142] Exh. 8 (Katz July 15), p. 12.
[143] Exh. 53 (Baldwin March 15), p. 37, Table 1; Exh. 56 (Baldwin July 15), pp. 8-9, 19-20; Exh. 54 (Roycroft June 1), p. 117-123.
[144] Exh. 6 (Katz June 1), p. 22.

deterioration of outside plant accurately conveys information to regulators that the ILECs lack effective competition in their provision of basic dial tone service.[145]

Finally, consumers' complaints to the carriers and to the Commission about rate increases and poor service quality, as well as poor customer service, can provide evidence of unjust and unreasonable rates.

*Availability of a service:* The availability of a service (and whether the service is offered on a stand-alone basis or only as part of a bundle) is another indicator of competition for that product. The Commission appropriately sought information in its OII Information Request No. 4 in its Appendix about the availability of basic service.[146]

*Advertising and aggressive sales:* Advertising practices, including aggressive upselling or forced migrations demonstrate a lack of alternatives for consumers and serves as a valid metric for assessing competition. Ms. Baldwin demonstrates that economics literature is entirely consistent with her recommendation that the Commission consider advertising as one of many metrics for taking the pulse of competition. [147] Ms. Baldwin notes that carriers rarely if ever advertise stand-alone voice and stand-alone broadband services, which is entirely consistent with products for which there is little competition. Ms. Baldwin also observes that companies' aggressive or deceptive marketing (usually in the form of aggressive upselling) is an attempt to force customers to migrate to bundles and could be evidence that customers lack alternatives and will only respond to the aggressive marketing by switching to an alternative service provided by the same company.

Carriers that are not motivated to sell stand-alone products will not advertise them. By comparison, the level of advertising for bundles indicates that carriers actively seek to sell those

[145] Exh. 53 (Baldwin March 15), pp. 31-32. Exh. 56, at pp. 20-22, Exh. 56, at pp. 20-22.
[146] Exh. 54 (Roycroft June 1), pp. 32-33.
[147] Exh. 53 (Baldwin March 15), pp. 34-35. Exh. 56 (Baldwin July 15), pp. 22-26.

services.[148] Carriers advertise their double-plays and their triple-plays *ad naseum* with television advertisements, mailings, and other means. Also, Ms. Baldwin recommends monitoring of aggressive and deceptive marketing where customers must rely solely on ILECs for their voice connections and the ILEC sales representatives push to migrate them to bundled offerings, perhaps implying that if they wish to retain their voice connection they must purchase a bundle.[149]

Dr. Katz's effort to discredit Ms. Baldwin's recommendation that the Commission monitor advertising as a way to gauge competition is unpersuasive because it is based on an incomplete and misleading interpretation of economics literature and faulty logic. For example, Dr. Katz attempts to make an analogy to the market for wheat, "There is very little advertising for different suppliers of wheat, which is often identified by economists as a quintessentially competitive industry."[150] Yet, his reliance on the wheat market is discredited by other economists, who use the wheat market as a straw man to dismantle the assertion that competitive firms do not advertise,

> A[n] … argument for why competitive firms have no incentive to advertise is that many close competitors could free ride on the advertising … Advertising by a wheat farmer may raise slightly the demand for all wheat, but it is unlikely to raise much the demand for this farmer's wheat relative to that of others.
>
> . . . .

[148] A simple Google search on AT&T, bundles, and advertisements yields many sites. See e.g., https://www.ispot.tv/brands/73l/at-and-t (site visited July 12, 2016); http://adage.com/article/cmo-strategy/sprint-directv-customers-free-sprint-year/300127/ (with article's first sentence beginning: "Just as AT&T is trying to draw consumers closer with packages bundling its phone service and DirecTV") ; AT&T Offers Two-Year Guaranteed Pricing For DirecTV Bundles - See more at: http://www.techtimes.com/articles/149407/20160412/at-t-offers-two-year-guaranteed-pricing-for-directv- 12 April 2016, 9:14 am EDT By Aaron Mamiit Tech Times - See more at: http://www.techtimes.com/articles/149407/20160412/at-t-offers-two-year-guaranteed-pricing-for-directv-bundles.htm#sthash.dIICulE1.dpufbundles.htm#sthash.dIICulE1.dpu; See also, relating to Frontier's bundles: http://internet.frontier.com/bundles/ (site visited July 12, 2016).

[149] Exh. 56 (Baldwin July 15), pp. 23-24.

[150] Exh. 6 (Katz June 1), at 23 cites omitted.

> Of course, firms to do not advertise when they cannot differentiate their products from many competing products. Yet the fact is that companies in tightly competitive situations often do a lot of advertising. Perdue chickens closely compete with other chickens, Chiquita bananas with other bananas, and Jaffa oranges with other oranges. Yet all these brands have been extensively advertised …[151]

Dr. Katz also mischaracterizes Ms. Baldwin's recommendation, implying that she is suggesting advertising by itself is an adequate measure of market share and power. TURN is not suggesting that a firm's marketing and advertising activity in and of itself will reveal monopolistic behavior, but instead that the Commission monitor carriers' advertising as one of many ways to assess the level of competition in relevant markets. Furthermore, the Commission should apply its administrative expertise and common sense to an interpretation of the economic incentives confronting carriers as they decide when and what to advertise recognizing that there is substantial evidence that reduced advertising is often in the interest of the monopolistic firm, and therefore low advertising is a reasonable symptom of monopoly.[152]

*Information:* In addition to the firms' advertising and marketing, the Commission should monitor whether information about the rates, terms, and conditions of service offerings, as well as information about the quality of service, is readily apparent and widely publicized. In a competitive market, information should be public and widely disseminated so that consumers

[151] Becker also finds: "The well known theorem [Dorfman and Steiner, 1954] that the incentive to advertise rises as the elasticity of demand for the advertised good falls is shown to be highly misleading, for the incentive to advertise may rise, not fall, as a market becomes more competitive. The reason is that the effect of advertising on the price of the good advertised may rise as the elasticity of demand for this good increased. Becker, Gary S., and Kevin M. Murphy. "A simple theory of advertising as a good or bad." *The Quarterly Journal of Economics* (1993): 941-964, at 943.

[152] See Ex. 56, (Baldwin July 15) pp. 24-26. In a monopoly setting, if the firm anticipates that decreased profit will result from advertising, the firm undersupplies advertising. This can result when advertising transfers useful information to consumers, increasing price elasticity of demand, and possibly lowering equilibrium price. This doesn't have much traction in the case of software—with low market penetration in 2003, an advertising campaign by Windows could substantially raise awareness about a new product, shifting the demand curve outward. The industrial organization literature, including Schmalensee's textbook on the subject, "Handbook of Industrial Organization, "further explains the conditions under which monopoly advertising falls below the social optimum (see for example, page 1753 of Schmalensee, Richard. *Handbook of Industrial Organization.* Vol. 3. Elsevier, 1989."

can make efficient purchasing decisions. When it is difficult for consumers to compare the prices of service offerings and when customers are denied access to service quality data because it has been designated as confidential, their purchasing decisions are inadequately informed, and the market works less efficiently than if the information were widely available and publicized.

*Elasticity of demand and supply*: Elasticity of demand is an important barometer of competition.[153] If customers do not change their purchasing decision in response to price changes (or do so only minimally), demand is considered less elastic and may indicate that not only do consumers consider the service to be essential but there is also a lack of adequate substitutes. Elasticity studies require sufficient multi-year data about price and demand, but if performed properly can be an indicator of where markets lack effective competition. If a supplier can increase its rates by a significant amount and sustain such increases profitably, that is, without losing so many customers as to render the price increase unprofitable, this is evidence of market power. This situation can arise when customers place a high premium on one or more attributes of the service, where there are high transaction costs to change suppliers, or where there are limited alternatives, then the consumer demand will be less responsive to a carrier's price increase than if migrating to a new supplier were "effortless." Suppliers can more easily exert market power where consumer demand is inelastic because of the essential nature of the good being purchased or because of the lack of available substitutes.

Elasticity of demand may vary by geography (e.g., wireless coverage is more likely to be spotty in rural areas and therefore wireless service is not perceived by consumers to be an acceptable substitute) and by demographics (older adults - who particularly depend on reliable

[153] Exh. 53 (Baldwin March 15), pp. 29-31.

connections to emergency services - may attribute a higher value (or "utility") to a copper dial tone with line power than do younger adults).[154]

The presence of other suppliers indicates the possibility that they can serve customers in the face of rate increases or service quality deterioration. However, markets with small numbers of suppliers and little evidence of market entry over a long period of time suggest that entry barriers exist, and that competition is less likely to provide market discipline.

*Benchmarking:* If a supplier's prices significantly exceed those of comparable suppliers, this may provide evidence of monopoly power.

*Termination charges:* Termination charges can create barriers to competition by making it difficult for customers to migrate among suppliers by imposing "switching costs." The Commission should evaluate whether customers are locked in through, for example, hefty early termination fees, restrictive bundling, or long term contracts.

*Activity in the wholesale market*: The Commission can monitor the relationship of the price of the ILECs' wholesale offerings to the price of comparable retail services to discern if there is a "price squeeze" that could only be sustained in the absence of meaningful competition.[155] In addition, the ILEC's installation, repair, and maintenance practices for wholesale facilities, and how it compares to relevant retail service practices, is also a relevant data point. However, if ILECs choose to neglect their retail service quality, requirements to maintain parity between wholesale and retail service quality will not suffice to ensure efficient CLEC entry into local markets. The Commission could analyze an equalizing event, such as a natural disaster or major outage, to determine whether ILECs restore wholesale facilities at the same speed as they do for their retail customers.

[154] Exh. 53(Baldwin March 15), pp. 29-31.
[155] Exh. 53 (Baldwin March 15), p. 35.

*4. The risks of misleading barometers*

The Commission should recognize that certain aspects of market behavior are not effective metrics for competition.

*Availability of voice service as a part of a bundled offering:* The availability of voice service that is offered as an element of a bundled offering (e.g., a "triple play" of voice, video, and broadband Internet access) does not serve as a barometer of competition that would yield just and reasonable rates for "unbundled" basic local service. As Ms. Baldwin explains, the fact that carriers sell bundles in addition to stand-alone services and features creates a compelling economic incentive for carriers to upsell bundles, possibly engaging in aggressive or deceptive marketing.[156] Therefore, contrary to some stakeholders' views, the availability of bundles does not constrain the rates for basic local exchange service, but instead places pressure on consumers to purchase more than they may need and creates an economic incentive for carriers to raise the prices for discretionary features sold on an a la carte basis, to drive consumers to bundles.[157] Indeed, Table 1 in Ms. Baldwin's March 15th testimony demonstrates the ability of ILECs to profitably sustain increases for discretionary features sold on a stand-alone basis and she further explains AT&T's economic incentives,

> If, for example, AT&T is the supplier of the stand-alone voice service, then AT&T's economic incentive is to try to drive the stand-alone customer to AT&T's own bundle (or wireless service). Accordingly, instead of bundles creating competitive pressure on stand-alone voice prices, AT&T's interest is in encouraging migration *within* AT&T's product line, by raising rates for stand-alone voice and discretionary features. Although ILEC bundles may compete with cable company bundles, there is no compelling evidence that either the ILEC-provided bundle or the cable company-provided bundle exerts sufficient pressure on stand-alone voice service so as to render just and reasonable rates.[158]

[156] Exh. 53 (Baldwin March 15), p. 35

[157] See, for example, Exh. 6 (Katz June 1), p. 16.

[158] Exh. 56 (Baldwin July 15), at pp. 10-11, footnote omitted.

*Predictive judgments about the emergence of potential competition.* For the detailed reasons set forth in Ms. Baldwin's March 15th testimony,[159] the Commission should afford no weight to predictive judgments about the emergence of potential competition.

* * * *

TURN fully supports the Commission's efforts to identify factors and metrics for the Commission to use to determine whether competition is maintaining prices at just and reasonable levels. As Ms. Baldwin explains:

> There is no simple litmus test to determine whether rates are just and reasonable in those markets where providers have been given total pricing flexibility yet where the markets have less than effective competition. The traditional approach for rate-of-return regulated utilities and for setting rates for wholesale unbundled network elements has been to analyze the underlying cost of providing the services and elements, while properly accounting for joint and common costs. If reliable cost information is not available, or if it is considered impractical to obtain such information, one possibility is to examine various indicators that might signal potentially anticompetitive behavior by market participants, which would, in turn, suggest the market lacks effective competition and therefore not produce just and reasonable rates. For example, the pricing flexibility that the FCC granted for ILECs' special access services was supposed to enable price decreases in light of "competition," but instead prices increased.[160]

Although there is no simple thumbs-up-thumbs-down test for whether rates for basic local exchange services are just and reasonable, the Commission can and should continue to apply its in-depth administrative expertise and common sense to interpreting the many metrics, as discussed above, that shed light on whether competition is sufficient to yield just and reasonable rates. The Commission should reject carrier attempts to narrow its Investigation.

It is not necessary to assess all of the metrics to make findings about whether markets are sufficiently competitive to yield just and reasonable rates. Instead, TURN recommends that

[159] Exh. 53 (Baldwin March 15), pp. 16-19.
[160] Exh. 53(Baldwin March 15), p. 26.

these metrics be used on a going-forward basis, along with Dr. Roycroft's competitive analysis, to assist the Commission in monitoring the status of competition in relevant markets. There is sufficient information in this proceeding for the Commission to deliberate and render findings regarding competition in California.

## IV. MARKET ANALYSIS

### A. Findings Demonstrate the Lack of a Competitive Market

When considering telecommunications markets, TURN encourages the Commission to focus on effective competition, rather than idealized "perfect competition."[161] Dr. Roycroft testified that for competition to be effective, consumers must have meaningful choices and be able to act upon those choices.[162] The success of the market mechanism in delivering the economically desirable outcomes of allocative and production efficiency depends on how easy it is for a consumer to "fire" their current supplier, and to replace the services that they had previously purchased with a new and independent source of supply.[163] AT&T witness Dr. Katz offers a similar perspective on the characteristics of effective competition, and the importance of consumer choice,[164]

> Professor Roycroft and I have offered similar frameworks. Professor Roycroft's statement that "[f]or competition to be effective, consumers must have meaningful choices and be able to act upon those choices" (Roycroft Reply Testimony, p. 14, ll. 13-14) is similar to my statement that "[e]ffective competition requires generally that consumers have access to meaningful alternatives. Specifically, two conditions establish effective competition: (a) the availability of multiple competing options from independent suppliers, and (b) the ability of some (but not necessarily all) consumers to switch among those options."[165]

[161] Exh. 54 (Roycroft June 1), p. 16.
[162] Exh. 54 (Roycroft June 1), p. 16.
[163] Exh. 54 (Roycroft June 1), p. 16.
[164] Exh. 1.5 (Katz March 15), p. 4.
[165] Exh. 8 (Katz July 15), p. 2.

Dr. Roycroft notes, however, that while Dr. Katz's approach to market analysis has similarities to his own, Dr. Katz does not reasonably apply the framework.[166] Ultimately, as noted by Dr. Roycroft, "the operative question in competition policy is whether there are policy levers that can be used to produce superior outcomes, not whether the market resembles the textbook model of perfect competition."[167]

As discussed above in Section III. A., Dr. Roycroft's detailed analysis in his testimony shows that there are limited choices for fixed voice and broadband providers, with wireless mobility markets exhibiting a somewhat higher degree of choice. The limited ability of consumers to choose from multiple alternatives and the high levels of market concentration that are evident in California markets raise red flags with regard to the existence of market power.[168] However, Dr. Roycroft does not limit his evaluation to market concentration. He addresses numerous other components of market structure and performance, which also point to potential problems.[169]

Both Dr. Roycroft and Ms. Baldwin testify that while consumer choice is fundamental to making a determination of effective competition, other factors must be considered through a process of market discovery.[170] In their evaluation of these other factors, both TURN witnesses find that in addition to limited choice, numerous other considerations pointed to the lack of effective competition.

- Dr. Roycroft and Ms. Baldwin found that the traditional CLEC sector, based on UNEs and resale, has contracted and plays a limited role in California's voice and broadband

[166] Exh. 54 (Roycroft June 1), p. 19-21.
[167] Exh. 54 (Roycroft June 1), p. 17, quoting an Ex Parte Submission of the United States Department of Justice, *In the Matter of Economic Issues in Broadband Competition, A National Broadband Plan for Our Future*, GN Docket No. 09-51, January 4, 2010.
[168] Exh. 54 (Roycroft June 1), p. 83.
[169] Exh. 54 (Roycroft June 1), pp. 85-130.
[170] Exh. 54 (Roycroft June 1), p. 17; Exh. 53 (Baldwin March 15), pp. 23-24, 27-35.

markets.[171]

- Dr. Roycroft testified that facilities-based wireline providers, such as AT&T and Time Warner Cable, continue to "stick to their turf," and do not compete in one another's service areas.[172]
- Pricing behavior in wireline voice and broadband markets is consistent with the existence of market power.
    - Carriers have increased rates for wireline voice and broadband services consistent with national pricing strategies and without regard to local market conditions.
    - Integrated mobility and wireline voice providers like AT&T California (and previously Verizon California) have unique incentives to raise wireline voice prices. Because integrated wireline/wireless voice providers may not lose all revenue when a wireline customer cuts the cord, economic incentives make it more likely that integrated providers will set higher wireline voice prices than firms that are not integrated providers of fixed and mobility voice services. AT&T California (and Verizon California when it was an integrated wireline/wireless carrier) raised basic service rates above those set by other URF carriers.
    - Carriers responses to a disruptive competitor such as Google Fiber indicate market power
    - Carriers impose switching costs on consumers by selling service bundles. Switching costs reduce the potential for effective competition.
    - Carriers impose switching costs on consumers by using long-term contracts, also reducing the potential for effective competition.

Based on TURN witness evaluation of market conditions, it is reasonable to conclude that that wireline providers, including LECs, face some limits on their ability to raise prices for wireline voice services.[173] However, TURN witnesses did not find that this limit was sufficient to ensure that rates and service quality levels for wireline voice services were just and reasonable.

*1. CLECs' exit reduces choice*

Dr. Roycroft and Ms. Baldwin have testified that the influence of the residential CLEC sector had all-but vanished. As discussed above, the limited success of the traditional CLEC industry in the 1997-2004 period was driven by a regulatory structure that enabled CLEC entry

[171] Exh. 54 (Roycroft June 1), pp. 85-96.
[172] Exh. 54 (Roycroft June 1), p. 81.
[173] Exh. 54 (Roycroft June 1), p. 139.

and marketing success through guaranteed access to wholesale markets. After that regulatory structure was dismantled, the residential CLEC industry collapsed and the disappearance of many CLECs, including the two largest residential suppliers, MCI and the legacy AT&T, had a profoundly negative impact on consumer choice.[174] The residential CLEC sector has become much less of a factor in California markets, as compared to the period when the original URF decision was issued, with CLECs now providing only 3.7% of residential wireline voice subscriptions in California.[175]

The number of resale and UNE CLEC lines in California has exhibited a general downward trend. Wholesale activity in AT&T and Verizon service areas in California has declined from approximately 1.4 million lines in 2005 (both residential and business) to about 870,000 lines in 2013 (the most recent year for which data is available). Given this decline of more than 500,000 connections during a period when the total number of connections in California increased from about 60 million to 85 million, the decline of the CLEC sector is even more pronounced.[176]

Indeed, public data, such as that reported by the FCC in its local competition report[177] and analyzed by Ms. Baldwin in her June testimony as well as confidential data submitted in response to the OII discovery questions and also analyzed by Ms. Baldwin[178] unambiguously

[174] Exh. 54 (Roycroft June 1), p. 86; Exh. 55 (Baldwin June 1), p.14.
[175] Exh. 54 (Roycroft June 1), p. 138.
[176] Exh. 54 (Roycroft June 1), p. 87.
[177] Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission, Voice Telephone Services: Status as of December 31, 2014, rel. March 2016 ("FCC Voice Telephone Service Report"). The report appears to replace the Bureau's Local Competition Report and is based on the carrier's Form 477 filings. Exh. 55 (Baldwin June 1), Exhibit SMB-2.
[178] Exh. 55 (Baldwin June 1), Confidential Exhibit SMB-1 and Confidential Exhibits SMB-4 through SMB-9 (Ms. Baldwin analyzes and includes confidential wholesale data that providers submitted in response to OII Information Requests).

demonstrates that there is negligible competition in residential markets based on CLECs' purchase of wholesale facilities.

*2. Incumbents stick to their turf*

Dr. Roycroft testified that eight years ago, when he prepared *The Limits of Choice* for TURN, evidence pointed to carriers "sticking to their turf," and not expanding outside of their service areas.[179] Since then, little has changed. Dr. Roycroft testified that Form 477 data indicates that cable and telephone companies have "stuck to their own turf." AT&T has not overbuilt any ILEC territory in the residential market, nor has Frontier. Cable companies like Comcast and Time Warner also do not challenge one another.[180] TURN's witness notes that in response to discovery, Time Warner states that it "is not aware of any service areas where we have overbuilt another cable provider's residential facilities and compete against it." Charter, in the public interest statement associated with the Charter/Time Warner/Bright House merger states "the merging firms do not compete for consumers of broadband, video, or voice, so there will be no impact on local competition in those markets.[181]

Dr. Roycroft also testified that given that there is evidence elsewhere in the nation that overbuilding networks can be profitable, such as Google Fiber's efforts in various cities around the nation, it would appear that the lack of head-to-head competition by cable and telephone companies against their brethren of the same mode (i.e., cable vs. cable and ILEC vs. ILEC) reflects a "live-and-let-live" arrangement and lower levels of competition.[182]

*3. Pricing strategies demonstrate potential for market power*

First, firms that believe that they are in a declining industry may take advantage of market segmentation strategies and try to exploit customers who do not have the ability to

[179] Exh. 54 (Roycroft June 1), p. 96.
[180] Exh. 54 (Roycroft June 1), 96-97.
[181] Exh. 54 (Roycroft June 1), p. 97.
[182] Exh. 54 (Roycroft June 1), p. 97.

choose alternatives.[183] Dr. Roycroft testified that if ILECs lose voice customers to wireless and cable alternatives, and also lose DSL customers to higher-quality cable offerings,[184] they may face incentives to recover joint and common network costs by raising prices to customers who cannot easily switch. However, because of the individual needs of some customers (for example, the elderly) or weak wireless coverage in certain areas, there remain a substantial number of households that will not find wireless-only to be a sufficient alternative, suggesting market power may still be an issue.[185]

Undue discrimination can also arise even if ILECs maintain uniform statewide rates for basic service. For those customers who cannot easily substitute to bundles or wireless, the higher basic rate is the only option. Carriers can offer bundles that implicitly price voice services lower than basic rates. Thus, discrimination that extracts higher prices for basic service from those who cannot easily switch does not require specific information regarding the status of a customer. Uniform, statewide basic voice prices, set to the levels that have been established by ILECs, pursuant to the economic motivations and minimal competitive pressure, effectively discriminates, harming the consumers who have the least ability to substitute.[186]

With regard to broadband services, Dr. Roycroft finds that pricing rivalry was absent. For cable broadband providers, Dr. Roycroft's study did not find support for the proposition that these companies are engaging in price competition in California.[187] Instead, Dr. Roycroft finds evidence of national pricing strategies, with a long string of price increases and he observed that price trends in residential broadband markets, where competition is lacking, are the opposite of the case for business-oriented Internet services, where price trends show year-over-year

[183] Exh. 54 (Roycroft June 1), p. 139-140.
[184] Exh. 54 (Roycroft June 1), p. 99.
[185] Exh. 54 (Roycroft June 1), p. 140.
[186] Exh. 57 (Roycroft Rebuttal), pp. 32-33.
[187] Exh. 54 (Roycroft June 1), p. 127.

declines.[188] Dr. Aron also presents evidence that the targeted price cutting that would be expected in competitive markets was lacking—service providers offer the same prices throughout the state.[189]

Second, Dr. Roycroft testified that economic theory shows that all firms recognize that if they raise prices, sales will be lost; however, firms that provide both wireline voice and wireless services see the world somewhat differently than firms that provide wireline voice alone.[190] When wireline prices are increased, some of the customers who drop wireline will instead use wireless services more intensively, resulting in increased revenues from wireless mobility operations. Dr. Roycroft testified that while AT&T (or Verizon when it was operating in California) will not recapture all of the lost revenues through their wireless affiliate, they will recapture some of the lost revenues from their wireless operations. The result is an incentive for firms like AT&T to raise wireline voice prices to higher levels than if the service provider did not have a wireless affiliate.[191] Dr. Roycroft points to observed basic service price trends in California as being consistent with these incentives. Figure 2 shows that AT&T and Verizon raised basic local service rates to higher levels than the URF carriers without wireless affiliates, Frontier and SureWest/Consolidated. Dr. Roycroft testified that this information suggests that

[188] Exh. 54 (Roycroft June 1), pp. 117-120.
[189] Exh. 5 (Aron June 1), p. 53.
[190] Exh. 54 (Roycroft June 1), pp. 128-129.
[191] Exh. 54 (Roycroft June 1), p. 129.

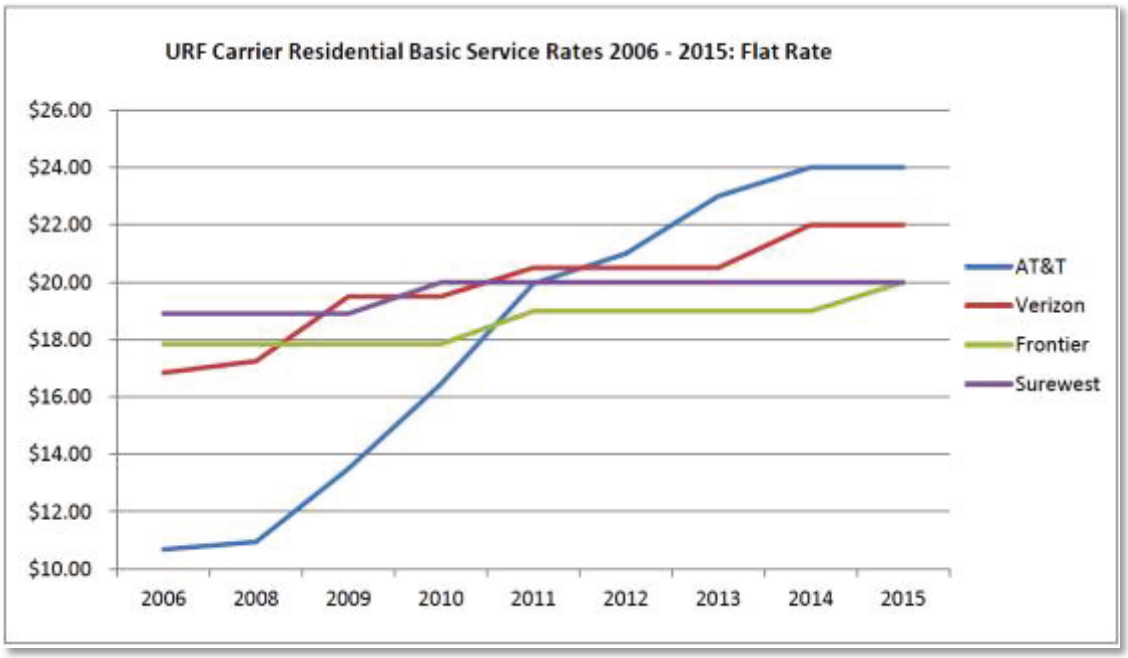



*Figure 2: URF Carrier Residential Basic Service Rate Increases (Exh 54 (Roycroft Opening), Figure 22)*

AT&T and Verizon rate increases reflect this natural pricing incentive associated with the integrated provision of fixed and mobility voice services, and indicate that voice service prices have not been constrained by market forces to just and reasonable levels.[192] During the hearings, Dr. Selwyn provided the example that incumbent carriers such as AT&T have not improved their product to match wireless service offerings such as bundling long distance or custom-calling features such as Caller ID.[193] In fact, AT&T has more than doubled the rate for Caller ID within the past ten years.[194] The level of the Federal Subscriber Line Charge, and its impact on the overall rate changed, was also discussed.[195] AT&T and Verizon rates are more

[192] Exh. 54 (Roycroft June 1), p. 129.
[193] RT 74:23-28-75:1-17; See also, 87: 1-18.
[194] *See* Communications Division "Summary of Uniform Regulatory Framework (URF) Carrier Residential Service Rate Changes", updated February 24, 2016 and posted here: http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Communications_-_Telecommunications_and_Broadband/Service_Provider_Information/Video_Franchising/URF%20Carrier%20Reported%20Rates%20Jan%202016.pdf
[195] RT 74:15-22; 90:16-19, 91:19-27

than 20% higher than Consolidated and Frontier rates when the SLC is included.[196] This confluence of factors indicates that ongoing oversight of ILEC prices and service quality are appropriate.[197]

Third, Dr. Roycroft also testified regarding evidence of pricing responses in markets where a disruptive entrant is present. Dr. Roycroft finds that where Google Fiber has entered broadband markets with its fiber to the home service it has had a disruptive impact on the cozy relationship between ILECs and cable companies. However, rather than looking to existing market prices to derive its price points, Google offers service choices that include a 1 gigabit (symmetric upload and download) speed for $70 per month. Comparing this to a Comcast basic offering of 25 Mbps at $60 per month, or an AT&T offering of 3 Mbps at $30 per month shows the disruption. Google's service, on a per-Mbps basis, is $0.07. Comcast's price is $2.40 per Mbps, AT&T's price is $10 per Mbps.[198]

Where Google Fiber has entered markets in other states, AT&T's responses are dramatic. AT&T has expanded its "GigaPower" fiber offerings in cities where Google has either begun or announced its intention to offer service. However, what is most notable is AT&T's pricing for its GigaPower service in cities where Google has actually begun operations. Where AT&T directly competes with Google, or believes that Google will soon be entering, such as Kansas

[196] According to the Communication Division's most recent "Market Pricing Survey of Retail Communications Services in California, the following combined flat rate and SLC charges are as follows:

| Carrier | Flat Rate Plus SLC | Percent above simple average of Surewest/Consolidated/Frontier rates. (Simple average used for Verizon's multiple rates as well). |
|---|---|---|
| AT&T California | $28.40 | 22.4% |
| Verizon California | $27.14, $28.50, $29.00 | 21.5% |
| Surewest/Consolidated | $26.49 | -- |
| Frontier | $19.61, $21.24, $25.50 | -- |

[197] Exh. 54 (Roycroft June 1), p. 140.
[198] Exh. 54 (Roycroft June 1), pp. 124-125.

City, Charlotte and Nashville, AT&T has dropped the price of its GigaPower service by $40 per month—from $110 to $70. This behavior is not limited to AT&T, as cable companies have been similarly disrupted by competition from Google Fiber. In Atlanta, both AT&T and Comcast have dropped prices and increased investment in light of a Google Fiber announcement that it will enter the market. Elsewhere, Comcast also has dropped prices to Google's levels of $70 per month. Alternatively, when Time Warner Cable learned that Google Fiber was exploring expanding service to Charlotte and Raleigh, Time Warner announced "TWC Maxx," which will increase speeds for customers six-fold, at no additional charge.[199]

The case of Google Fiber provides a clear illustration of the consequences of broadband market power. AT&T charges customers who do not have the competitive choice of Google Fiber prices that are 36% higher. Time Warner drops per-Mbps-prices by a factor of six. It is Dr. Roycroft's testimony that it is reasonable to conclude that California consumers are paying similar premiums for their broadband services, resulting in overcharges for essential residential wireline broadband services. Market forces are not protecting consumers in California broadband markets.[200]

Fourth, Dr. Roycroft testified that the emergence of wireline broadband data caps is another indicator of broadband market power, price discrimination, and anticompetitive behavior.[201] Dr. Roycroft notes that there is no technical reason for data caps, and not all broadband providers impose them. For example, Cablevision, Charter, and Google Fiber have not imposed data caps.[202] Dr. Roycroft testified that National Cable and Telecommunications Association chair Michael Powell has stated that data caps are "not about capacity," a position

[199] Exh. 54 (Roycroft June 1), pp. 125-126.
[200] Exh. 54 (Roycroft June 1), p. 126.
[201] Exh.54 (Roycroft June 1), p. 120.
[202] Exh. 54 (Roycroft June 1), p. 121.

that is reiterated in leaked Comcast customer-service training documents.[203] Dr. Roycroft notes that data caps are of particular concern given consumer's growing preference for over-the-top video, and reflect broadband provider efforts to stifle consumer choice of over-the-top video offerings. Dr. Roycroft concludes that data caps are nothing more than price increases that reflect market power.[204]

*4. Switching costs create barriers for consumers*

The existence of switching costs makes it less likely that competition will be effective. A customer's ability to switch among providers may be limited by factors beyond the number of alternative choices, such as the affordability of the alternatives. It is also recognized by economists that switching costs may be cultivated by firms.

For example, the Scoping Memo raises the question of how bundles impact the definition of the market. Dr. Roycroft explains that bundling is one of several market segmentation strategies pursued by telecommunications carriers, enabling price discrimination.[205] Dr. Roycroft demonstrates that bundling is frequently used to sell telecommunications services in California, and this fact was also supported by AT&T witness Dr. Aron, who catalogues service offers in her June 1, 2016 testimony, where she shows that bundles were prevalent and stand-alone options were scarce, concluding that "Wireline plans that provide local voice service only are offered by AT&T and by some cable companies such as Wave Broadband and Cox…"[206] Dr. Aron also notes that due to the bundling and pricing promotion practices of some carriers, "It's not clear what retail rates are."[207] Dr. Roycroft testified that bundling imposes switching

[203] Exh. 54 (Roycroft June 1), p. 121.
[204] Exh. 54 (Roycroft June 1), pp. 121-122.
[205] Exh. 54 (Roycroft June 1), p. 111.
[206] Exh. 5 (Aron June 1) p. 52. *See also, infra*, Section II. B., noting that firms aggressively bundles.
[207] Exh. 5 (Aron June 1), Appendix 1, p. 40.

costs on consumers, making it easier for firms to raise prices, and potentially blocking entrants, especially if an entrant does not have the ability to offer equivalent bundles.[208]

Another example of switching costs is long-term contracts commonly associated with bundles in wireline markets. Dr. Roycroft testified that it has long been recognized that term contracts with breach penalties impose switching costs on consumers. Contracts make it more difficult for consumers to respond to lower prices offered by rivals. If a consumer faces a penalty for switching providers, choice is distorted.[209] Firms can take advantage of the locked-in consumers' reluctance to switch. Second, if locked-in consumers do not respond to lower prices for individual services offered by rivals, a new market entrant that cannot offer bundles faces a much more difficult task when entering the market. If bundled consumers are "owned" by the incumbent service provider, an entrant will have to bear additional costs if they are interested in serving the customer, which contributes to an entry barrier.[210]

Switching costs also provide a profitable avenue for ILECs to raise stand-alone basic rates to the disadvantage of consumers who have the least ability to cut the cord, or adopt cable VoIP alternatives.[211] Dr. Katz agrees when he notes that, "By reducing consumer responsiveness to price, switching costs may make price increases relatively more profitable."[212] While carrier witnesses stated that this type of price discrimination was not possible, alleging that ILECs need to know with specificity which customers will have a hard time substituting, or do not vary prices by geography,[213] Dr. Roycroft explains that bundling eliminates the need for price increases targeted by geography or demographic characteristics. Rather, when setting basic

[208] Exh. 54 (Roycroft June 1), pp. xi, 113.
[209] Exh. 54 (Roycroft June 1), p. 116.
[210] Exh. 54 (Roycroft June 1), p. 113.
[211] Exh. 57 (Roycroft Rebuttal), p. 32.
[212] Exh. 1.5 (Katz May 15), p. 9.
[213] See, for example, Exh. 28, (Gillan June 1), p. 9. See also, Exh. 5 (Aron June 1), p. 53.

wireline service prices, an ILEC need not know specifically whether Mr. Jones or Ms. Smith will have a difficult time substituting wireless calling for wireline service. All the ILEC needs to know is that there are some customers who have this difficulty, which even Cox witness Mr. Gillan indicates is abundantly clear.[214]

Dr. Roycroft finds that in wireless mobility markets, the level of rivalry between carriers is sufficient to result in customers facing offers from competing carriers to cover contract termination fees.[215] However, it is Dr. Roycroft's testimony that there is no evidence that wireline voice and broadband providers are making similar offers, which indicates that rivalry is less pronounced on the wireline side.[216]

**B. There is Ample Evidence that Markets are Highly Concentrated**

Because TURN was unable to access the Form 477 subscription information, Dr. Roycroft's ability to conduct market share analysis was somewhat limited.[217] However, he reached some conclusions regarding market share in the requested markets. With regard to wireline voice service, Dr. Roycroft points to the market concentration study presented in the *2015 Communications Division Market Share Report*. For wireline voice, that report identifies a very highly concentrated market, with Herfindahl-Hirschman Index (HHI) values of approximately 7,000.[218] This value is 4,500 points above the Department of Justice HHI threshold for highly concentrated markets of 2,500.[219] However, Dr. Roycroft notes that the Staff Report's methodology likely overstated concentration in the wireline voice market to some

[214] "There are certainly customers that, for reasons of geography or preference, would never consider wireless service to be a substitute for residential voice service." Exh. 28, (Gillan June 1), p. 9.
[215] Exh. 54 (Roycroft June 1), pp. 116-117.
[216] Exh. 54 (Roycroft June 1), p. 117.
[217] Exh. 54 (Roycroft June 1), pp. 6-7.
[218] 2015 CD Market Share Report, p. 10.
[219] Exh. 54 (Roycroft June 1), pp. 26 & 80.

degree, as the Staff separately studied wireline VoIP. Dr. Roycroft testified that this classification results in a "Wireline Voice market" that is more concentrated, and a "VoIP market" that is less concentrated than would have resulted from the more reasonable approach of including all wireline voice offerings into a single classification. Dr. Aron agrees with Dr. Roycroft's perspective on the appropriateness of classifying legacy wireline voice and wireline VoIP in the same market.[220]

Given the small market share associated with wireline VoIP (6.9%), concentration continues to be very high.[221] As discussed above in Section II.A., Dr. Roycroft's study of the deployment of voice and broadband services (any speed for broadband) pointed to a duopoly market for the overwhelming majority (76.4%).[222] The results of Dr. Roycroft's study show that California households face limited competition and choice for wireline voice and broadband service at any speed.[223]

With regard to fixed broadband services, Dr. Roycroft's analysis also shows that choice was limited. While specific market shares could not be discerned by Dr. Roycroft for the overall fixed broadband market, for broadband services at speeds that exceed the FCC's 25/3 Mbps benchmark for "advanced telecommunications," Dr. Roycroft determined that many California households face an outright monopoly.[224]

Dr. Roycroft's study shows that that 63.8% of California households in the study area face a broadband monopoly at the 25/3 Mbps service level. Table 2, which is reproduced from Dr. Roycroft's testimony[225] summarizes choices by county, those counties where the majority of

[220] Exh. 7 (Aron July 15 Rebuttal), pp. 14-15.
[221] Exh. 54 (Roycroft June 1), p. 138.
[222] Exh. 54 (Roycroft June 1), p. 50.
[223] Exh. 54 (Roycroft June 1), p. xi.
[224] Exh. 54 (Roycroft June 1), p. 58.
[225] Exh. 54 (Roycroft June 1), p. 58 (Table 5).

households face a monopoly are highlighted in yellow. San Mateo is highlighted in orange to indicate the category where the most customers (but not a majority) face a monopoly. San Francisco is the lone county with a somewhat better situation for consumers—with 45% facing a duopoly, and over 40% having three or more choices at the 25/3 Mbps service level. Dr. Roycroft testified that for 63.8% of households where broadband service at 25/3 Mbps is only available from their cable provider, the market is highly concentration—cable companies have a 100% share, thus, those households experience market conditions that reflect the maximum HHI value of 10,000.[226]

| **Broadband Provider Choice at 25 Mbps Up/3 Mbps Down** | | | | | | |
|---|---|---|---|---|---|---|
| **County** | **No Provider** | **One Provider** | **Two Providers** | **Three Providers** | **Four Providers** | **Five Providers** |
| Alameda | 2.51% | 53.30% | 39.94% | 4.25% | 0.00% | 0.00% |
| Contra Costa | 2.85% | 56.97% | 33.31% | 6.46% | 0.40% | 0.00% |
| Fresno | 14.88% | 75.60% | 9.53% | 0.00% | 0.00% | 0.00% |
| Humboldt | 24.57% | 75.12% | 0.31% | 0.00% | 0.00% | 0.00% |
| Kern | 13.81% | 77.86% | 8.33% | 0.00% | 0.00% | 0.00% |
| Los Angeles | 0.47% | 65.93% | 33.03% | 0.57% | 0.00% | 0.00% |
| Orange | 2.97% | 78.68% | 18.32% | 0.04% | 0.00% | 0.00% |
| Riverside | 3.74% | 48.21% | 48.05% | 0.00% | 0.00% | 0.00% |
| Sacramento | 5.29% | 59.95% | 29.86% | 4.84% | 0.07% | 0.00% |
| San Bernardino | 6.97% | 50.09% | 42.94% | 0.00% | 0.00% | 0.00% |
| San Diego | 4.45% | 85.69% | 9.87% | 0.00% | 0.00% | 0.00% |
| San Francisco | 2.13% | 9.71% | 45.18% | 30.90% | 10.16% | 1.92% |
| San Joaquin | 7.86% | 83.10% | 9.04% | 0.00% | 0.00% | 0.00% |
| San Mateo | 4.07% | 38.82% | 36.59% | 18.90% | 1.57% | 0.05% |
| Santa Clara | 4.92% | 63.60% | 28.98% | 2.49% | 0.01% | 0.00% |

[226] Exh. 54 (Roycroft June 1), p. 78.

| Broadband Provider Choice at 25 Mbps Up/3 Mbps Down | | | | | | |
|---|---|---|---|---|---|---|
| **County** | **No Provider** | **One Provider** | **Two Providers** | **Three Providers** | **Four Providers** | **Five Providers** |
| Shasta | 26.08% | 73.92% | 0.01% | 0.00% | 0.00% | 0.00% |
| Ventura | 2.47% | 58.20% | 39.33% | 0.00% | 0.00% | 0.00% |

For mobility voice and broadband services, Dr. Roycroft did receive state-level subscriber information that enabled the calculation of market share and HHI values. Dr. Roycroft's analysis showed that market concentration in the wireless mobility market is lower in California than the nationwide levels reported by the FCC, but still highly concentrated by the DOJ benchmarks. Based on data received from the four major wireless carriers, Dr. Roycroft estimates the wireless mobility HHI to be approximately 2,600 in California,[227] which is 100 points above the U.S. Department of Justice's "highly concentrated" HHI threshold of 2,500.[228]

Thus, with regard to market analysis, TURN presents evidence, based on standard economic analysis, consistent with the approach contained in the Department of Justice's 2010 *Horizontal Merger Guidelines*, that markets are highly concentrated, making effective competition in wireline voice and broadband markets less likely and undermining the use of competition as a means to discipline rates in the marketplace. Other factors, discussed below, also point to the lack of effective competition.

[227] Exh. 54 (Roycroft June 1), p. 65.
[228] Exh. 54 (Roycroft June 1), p. 76.

### C. Poor Market Performance as Evidence of Lack of Competition

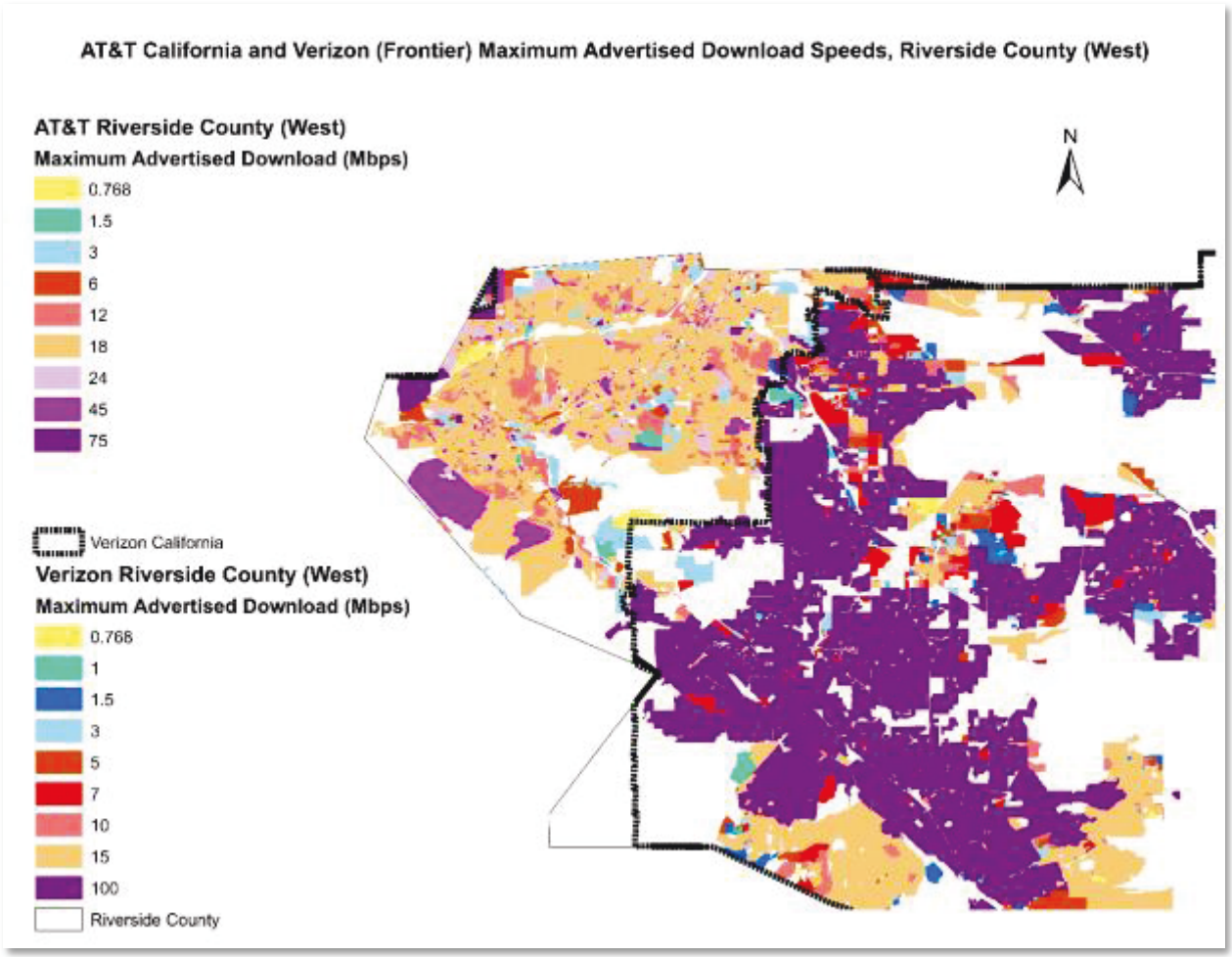
#### 1. *Failure to invest results in poor performance and lack of consumer choices*

The Scoping Memo poses questions regarding market performance and development as measured in data speeds, service quality and innovation.[229] Dr. Roycroft provided substantial evidence that markets are performing poorly in the areas of data speeds, service quality, and innovation. This poor performance is largely associated with AT&T's failure to pursue investments in state-of-the-art broadband technologies that would allow it to match or exceed cable-company performance. The lack of investment and innovation undermines AT&T's ability to compete with its cable rivals, and also undermines cable company incentives to invest.[230] The lack of AT&T's competitiveness further undermines consumer choice and increases the concentration in broadband markets.[231]

Dr. Roycroft provided a clear illustration of the impact of AT&T's lack of investment by comparing portions of AT&T California's and Verizon California (now Frontier) service areas in the western portion of Riverside County. Verizon, in its Riverside service area (shown inside the bold dashed line in Figure 2), deployed fiber to a large number of households. As a result, Verizon can report maximum advertised download speeds of 100 Mbps covering a broad area of Verizon's service area in the western portion of Riverside County. However, Dr. Roycroft demonstrated that AT&T California's service area shows only spotty coverage at download speeds above 18 Mbps, and 18 Mbps represents the maximum advertised download speed for the overwhelming majority of the AT&T California's service area in western Riverside County—as it is in the rest of the state.[232] Dr. Roycroft presented information from the 2015 Form 477 data

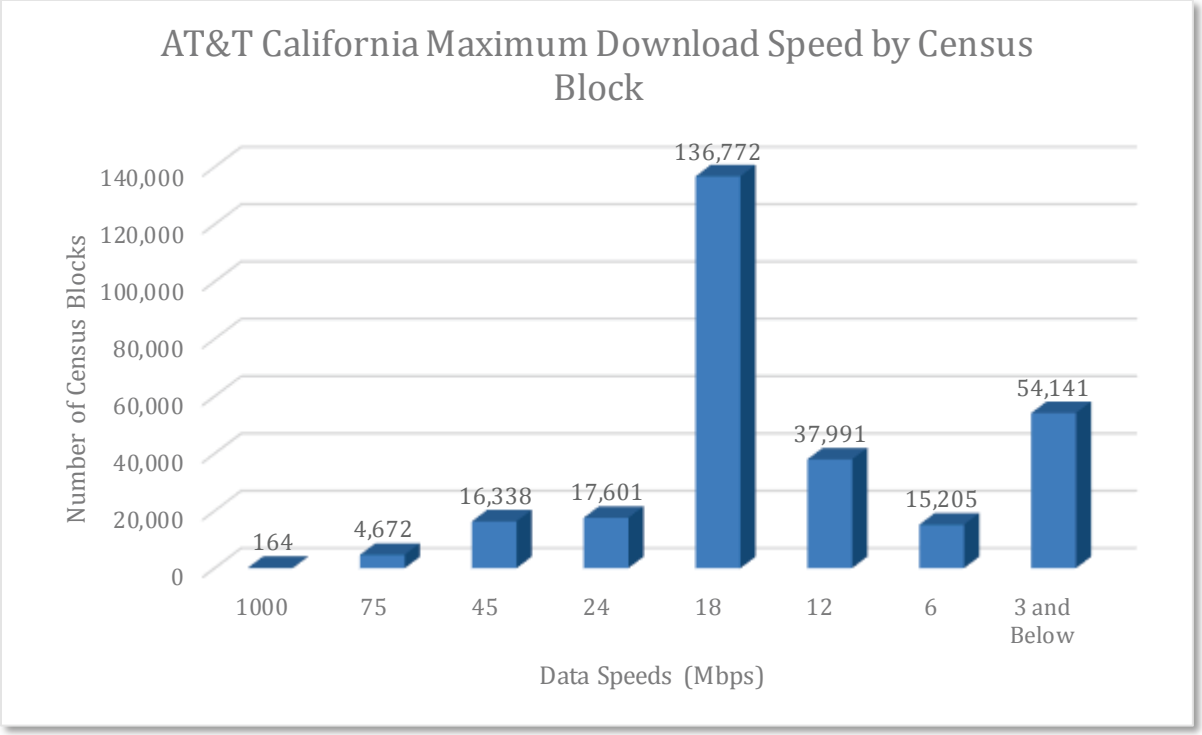
[229] Scoping Memo, Appendix A, §3(d).
[230] Exh. 54 (Roycroft June 1), pp. 124-126.
[231] Exh. 54 (Roycroft June 1), p. ix.
[232] Exh. 54 (Roycroft June 1), p. 99.

that indicates that AT&T serves over 99% of Census Blocks in its California territory with copper-based DSL technologies.[233] Dr. Roycroft's Appendix B to his June 1 testimony used mapping of ILEC and cable service area download speeds that clearly show that AT&T California has fallen far behind cable rivals. In many areas where AT&T California has failed to invest, consumers face a monopoly for high-quality broadband services.[234]




Dr. Roycroft also presented information regarding AT&T California's maximum download speeds in California by Census Block. As shown in Figure 3, the overwhelming majority of which (86%) have speeds of 18 Mbps and below.

[233] Exh. 54 (Roycroft June 1), p. 99.
[234] Exh. 54 (Roycroft June 1), p. 100.




Dr. Roycroft further illustrates the impact on market competition by comparing download speeds available from cable companies with the speeds available from ILECs. Dr. Roycroft testified that the situation in Alameda County is typical. As can be seen in Figure 4, the majority of AT&T customers cannot obtain speeds of 25 Mbps or greater in Alameda County.[235] This can be compared with the maximum advertised download speed the cable provider Comcast, which has a maximum advertised download speed of 250 Mbps throughout its service area, as shown in Figure 5.[236] Dr. Roycroft presents a comprehensive picture of the impact of the lack of AT&T investment in Appendix B of his testimony, which provided maps that enable the visualization of data speeds for AT&T and other service providers at the county level. Without exception, Dr. Roycroft's study, as summarized in Appendix B of his June 1 testimony, shows that AT&T and other URF ILECs have not consistently invested to upgrade wireline broadband facilities in

[235] Exh. 54 (Roycroft June 1), p. 101.
[236] Exh. 54 (Roycroft June 1), p. 102.

California. The consequence of this lack of investment is diminished competition. Dr. Roycroft testified that in many areas where AT&T California has failed to invest, consumers face a monopoly for high-quality broadband services. This monopoly situation affects about 63% of California households in the counties that Dr. Roycroft studied. This is a market failure with which the Commission should be deeply concerned because monopoly markets systematically harm consumers, resulting in higher prices, lower levels of consumption, and social welfare loss.[237]

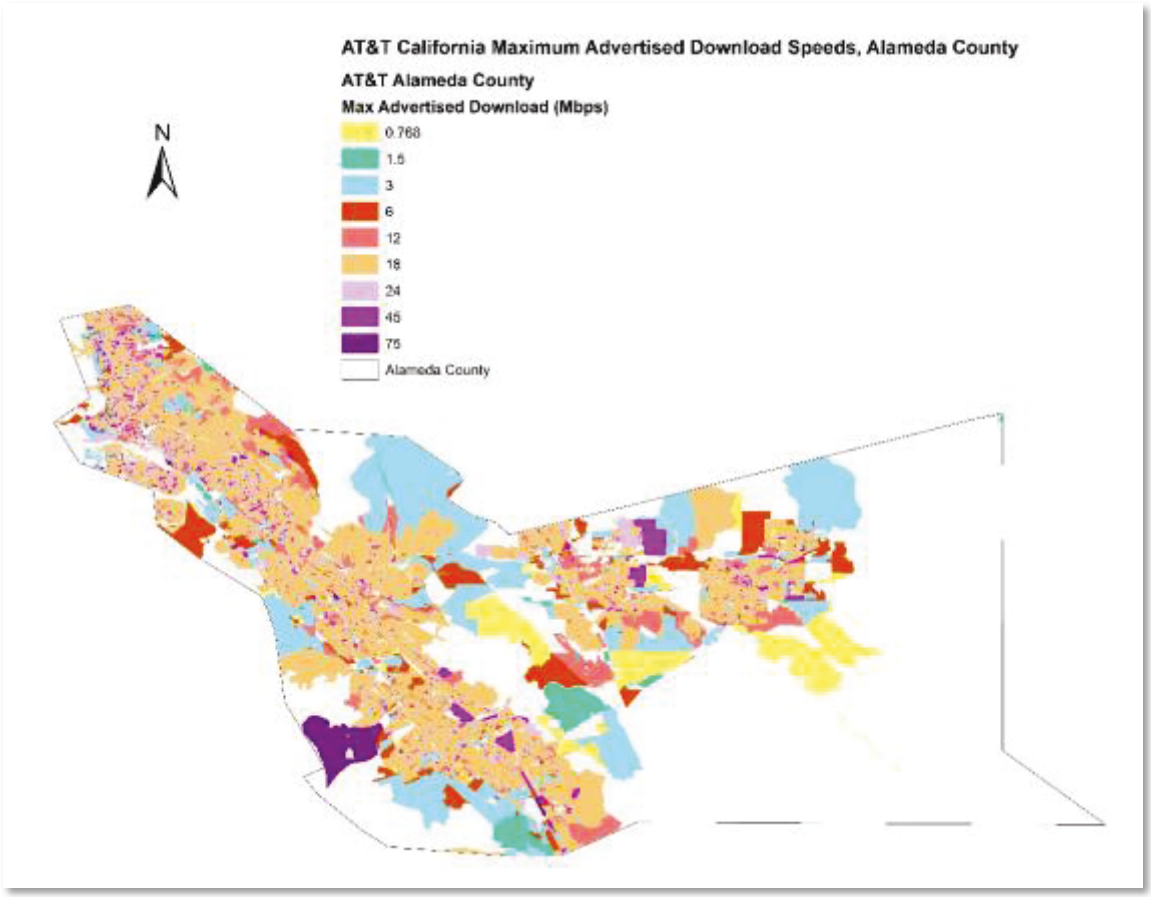



*Figure 4: AT&T Maximum Advertised Download Speeds, Alameda County (Exh 54 (Roycroft Opening), Figure 15)*

[237] Exh. 54 (Roycroft June 1), p. ix, 103.

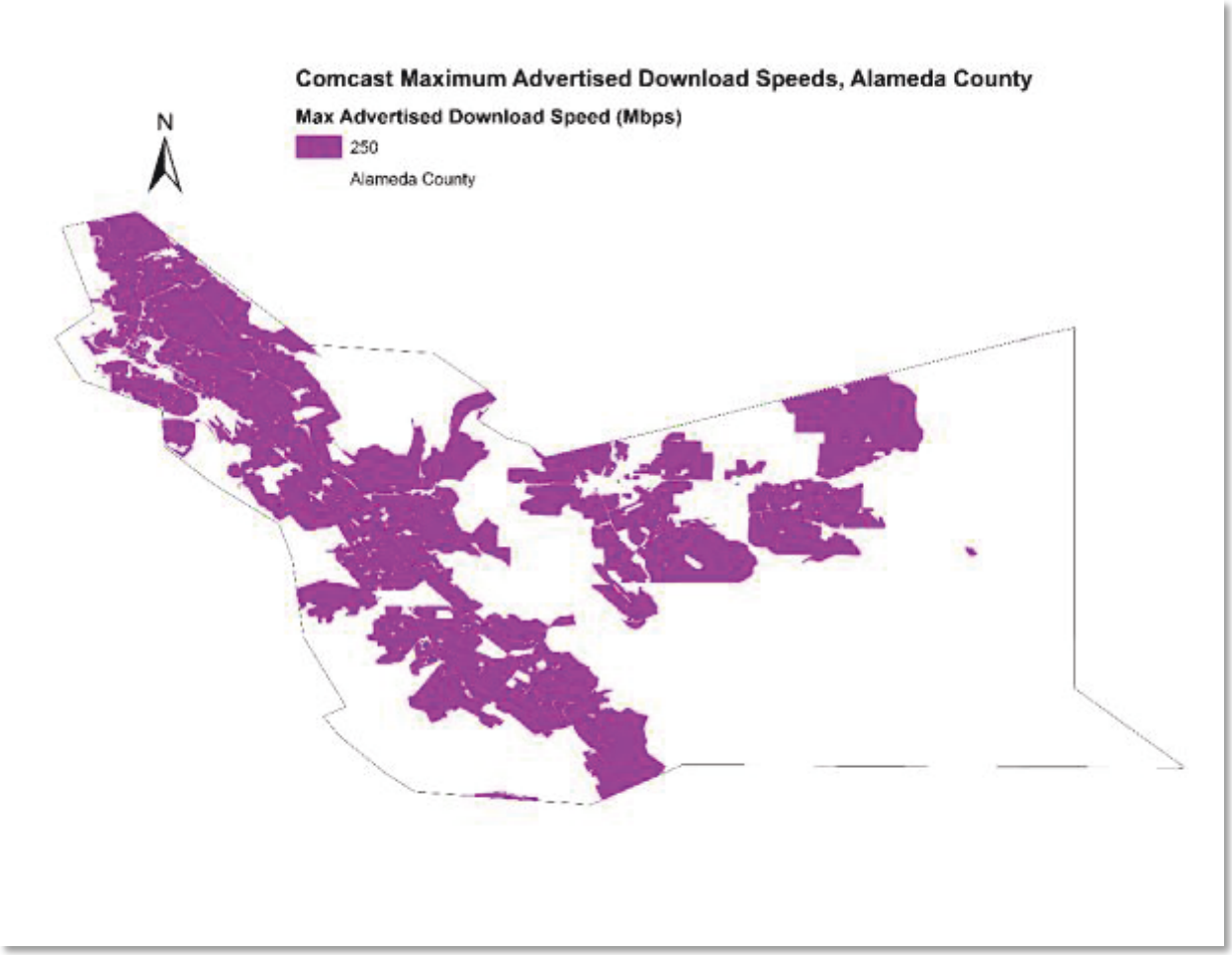



*Figure 5: Comcast Maximum Advertised Download Speeds, Alameda County (Exh 54 (Roycroft Opening), Figure 16)*

2. *Wireless markets display mixed results but concern over safety and infrastructure*

Dr. Roycroft testified that it would not be surprising to find an industry with only four firms engaging in "follow the leader" practices that would result in little rivalry among the firms.[238] However, Dr. Roycroft found that T-Mobile continues to play the role of a disruptive firm, which, from the perspective of consumers, is a positive influence on the market. For example, beginning in 2013, T-Mobile moved away from subsidized handset bundles, a move that was eventually followed by other carriers. The elimination of subsidized handsets has

[238] Exh. 54 (Roycroft June 1), p. 66.

allowed price-points to become more visible to consumers, and for those consumers who cannot afford the purchase of a handset outright, carriers and vendors are offering installment payment options that may forego interest payments.[239]

Dr. Roycroft also noted that there have been some promising developments regarding wireless mobility prices, but it may be too early to tell whether these will be sustainable. Dr. Roycroft pointed to the most recent FCC report on competition in the wireless industry, which identified competitive offers made by carriers as being primarily in the form of promotions. Whether the recent aggressiveness of T-Mobile will be an ongoing trend is not clear. Dr. Roycroft noted that the impact of recent activities has been a decline in wireless industry average revenue per unit (ARPU) over the past two years. During this same period, wireless data usage increased substantially, suggesting that unit prices are falling.[240]

Dr. Roycroft testified that wireless networks are now utilized to deliver the majority of emergency calls.[241] Recognizing that wireless 911 location accuracy has presented problems for first responders, the FCC has developed new 911 location accuracy requirements, which focus on indoor locations. However, Dr. Roycroft testified that the FCC's requirements while moving in the right direction, are characterized by an extended implementation schedule, and standards that are less than adequate. Dr. Roycroft testified that under the FCC's approach to improved location accuracy, it will take 6 years to get the point where 20% of 911 calls will still not be required to provide horizontal or vertical location accuracy.[242] Thus, the FCC's approach will

[239] Exh. 54 (Roycroft June 1), p. 66.
[240] Exh. 54 (Roycroft June 1), pp. 67-68.
[241] Exh. 54 (Roycroft June 1), p. 68.
[242] Exh. 54 (Roycroft June 1), p. 69.

leave a substantial portion of potential 911 callers at risk. The Commission should consider whether the national standards are sufficient for Californians.[243]

Dr. Roycroft also pointed out, with regard to wireless service quality and infrastructure deployment, that the communication needs of millions of California consumers are potentially compromised by insufficient provisioning of backup power, which places this important component of the state's overall communications infrastructure at risk when grid power is out.[244] As a result, Dr. Roycroft recommended that the Commission should consider backup power requirements that will improve the resiliency of wireless networks, and identified standards that were imposed by the FCC, and then later abandoned, associated with the Katrina Panel Report.[245] Dr. Roycroft recommended that the Commission consider imposing requirements for 24-hour backup power requirement for central offices, and the 8-hour backup power requirement for cell sites.[246]

**D. Wholesale Market Failures Directly Impact Retail Competition**

The record demonstrates that monopoly behavior in the wholesale market can impact retail competition. Testimony from TURN, wireless, and CLEC witnesses describe the lack of competition for wholesale services that limit opportunities for additional retail competition. The viability of the efficient evolution of wireless voice and broadband markets depends on special access services offered at rates, terms, and conditions that would prevail if such markets were competitive. Consumers pay more not only for retail telecommunications but for the vast array of consumer products and services that are more costly due to inflated prices for wholesale

[243] Exh. 54 (Roycroft June 1), p. 69.
[244] Exh. 54 (Roycroft June 1), p. 70.
[245] Exh. 54 (Roycroft June 1), p. 70.
[246] Exh. 54 (Roycroft June 1), p. 72.

inputs.[247] Ms. Baldwin states that monopoly behavior in the wholesale market can impact retail competition, and "because of the lack of retail competition based on wholesale inputs," she concludes that, "the Commission should impose greater accountability on dominant providers with respect to their retail rates and service quality.[248]

Competitive carrier witnesses testified to the failures in the wholesale and special access markets, in part due to the ILECs' dominance, including CALTEL (whose members supply wholesale facilities to other carriers and also rely on ILEC-provided wholesale facilities), wireless carriers such as Sprint (which rely on special access circuits in order to provide cell phone service to end users), and cable companies (expressing frustration with interconnection agreement processes and barriers to interconnection).[249]

*1. Interconnection*

CLECs rely on wholesale facilities primarily to compete in business retail markets.[250] Because of the dependence on ILEC wholesale facilities and services, CLECs that serve business markets are at a negotiating disadvantage because the ILECs supplying these essential facilities to their rivals lack an economic incentive to offer services based on reasonable rates, terms, and conditions.

The ILECs responded to the OII's Information Requests about wholesale market failures by assuring the Commission that the market was properly functioning. However, the CLECs raise serious concerns about monopoly behavior and market abuse. For example, AT&T states that it had "no knowledge of abuses of market power." [251] By contrast, Charter, Comcast, and Sprint express concerns about ILECs' market dominance stating that, "ILECs have market power

[247] Exh. 55 (Baldwin June 1), p. 5.
[248] Exh. 56 (Baldwin July 15), p. 3.
[249] Exhs. 24, 55, 56, 78, Sanders-April 15 (Charter), at 9; Cox response to 14.e.
[250] RT 155-156; Exh. 24 (DeYoung July 15) p. 24.
[251] Exh. 55 (Baldwin June 1), pp. 35-41, citing AT&T response to Information Request 14e.

in their provision of special access (both backhaul and building access) and interconnection.[252] Ms. DeYoung appeals to the Commission to stay vigilant, "I wanted to correct any misimpression that CalTel has sufficient bargaining power to enter into 'blue sky' negotiations that substantively changed any of the rates that were adopted by this Commission in 2004."[253] And Cox states that it "believes that ILECs still retain substantial market power with regards to interconnection and related terms contained in interconnection agreements, and have incentive and opportunity to exercise such power. Therefore, clear opt-in guidelines and access to state commission arbitration as required by the Act remain essential to CLEC on-going competitiveness."[254] Consistent with these various concerns, TURN urges the Commission to recognize that the potential and incentive exist for ILECs to abuse their market power in their provision of wholesale services that, in turn, impacts retail competition.

Moreover, these concerns underscore the importance of the CPUC's role as a referee between ILECs and CLECs, to ensure the fair and efficient evolution of competitive markets. For example TURN witness Baldwin recommends,

> [T]here is of course an uneven bargaining position between the incumbent carriers and the new entrants that rely on the wholesale elements and services that are offered by the incumbent carriers. And therefore, the Commission's role as an arbitrator, as a regulatory referee, is critically important if the Commission is to facilitate competition, is seeking to eliminate barriers to competition.[255]

In any competition review, the Commission should factor in the ILECs' strong incentive to find competition (of any type or level) to obtain the benefits of deregulation and afford ILEC testimony the proper weight.[256]

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[252] Exh. 55, pp. 38-41. Sprint "contends " Exh. 55, p. 40, citing Burt-April 15 (Sprint), at 6-7.
[253] RT 23:15-20.
[254] Exh. 55(Baldwin June 1), at p. 39, citing Cox response to OII No. 14.e.
[255] RT 133:14-23.
[256] Exh. 55 (Baldwin June 1), pp. 37-38.

Because of the ILECs' greater bargaining leverage in their provision of wholesale inputs to CLECs, the CPUC should stand ready to arbitrate as necessary to ensure that the rates, terms and conditions of carrier-to-carrier interconnection agreements promote economically efficient, technologically neutral, and fair wholesale-based competition.[257] Ongoing Commission oversight of the wholesale market is essential to ensure that ILECs do not discriminate against their competitors. Moreover, the CPUC should participate in the FCC's technology transition to ensure that federal policy fosters efficient competition in California's markets.

*2. Special Access*

In many locations, there are limited substitutes or competitive alternatives for the special access services that ILECs offer.[258] The fact that providers purchase *some* of their special access from carriers other than ILECs does not alter ILECs' dominance of special access markets. As Ms. Baldwin explains:

> While CLECs have built fiber connections to some commercial buildings and cell sites, it is uneconomic for them to serve most locations because of costs and/or available revenues. In the overwhelming majority of cases where a CLEC needs to provide a dedicated connection to a building because it cannot economically deploy its own fiber (for example, to provide service to a business customer with multiple locations), its only available option is to purchase an ILEC-provisioned special access service.[259]

Special access services offered at reasonable rates, terms, and conditions are essential to enable wireless carriers, especially those without a wireless affiliate, to compete effectively and to offer consumers the benefits of such competition.[260] The CPUC should afford little weight to sweeping generalizations regarding the purported competitiveness of the special

[257] Exh. 56 (Baldwin July 15), p. 3, ll. 14-18.
[258] RT 25:12-21 (De Young).
[259] Exh. 55 (Baldwin June 1), at pp. 3-4.
[260] Exh. 55, at p. 4. See also, Ex. 55 (Baldwin June 1), Confidential Exhibit SMB-1.

access market.[261] Dr. Topper provides a misleading depiction of the structure of the special access market by ignoring the fact that many relevant geographic and product markets are highly concentrated and he failed to identify the wireless industry's reliance on special access services.[262] Dr. Topper's assertion that wireless providers are not dependent on wholesale inputs from ILECs "to a degree that should concern the Commission" lacks empirical support. He did not support his claims using data regarding wireless backhaul that carriers submitted in response to the Commission's OII questions in this proceeding (or to the facts gathered and analyzed in the FCC's special access proceeding), but instead relies simply on generalities, trade press, and financial reports to support his analysis.[263]

Similarly, the Commission should afford little weight to Frontier's and Consolidated's sweeping and unsubstantiated assessments of special access markets. In Frontier's responses to OII Information Requests it states, "First, ILEC competitors are generally not dependent on the ILEC. Second, any perceived 'dependency' on wholesale inputs or special access relates to services that are provided at tariffed, regulated rates" (response to No. 13) and asserts that special access services are "substantially competitive" (response to No. 15)."[264]

Contrary to the ILECs' unsupported assertions that CLECs are not dependent on incumbent special access services, Ms. Baldwin relies on data responses and testimony from carriers in this docket to demonstrate that ILECs supply the vast majority of wireless carriers' backhaul.[265] The record clearly demonstrates that wireless carriers depend on special access in

[261] See, e.g., Exh. 41, (Topper June 1), pp.43-47.
[262] See, e.g., Exh. 76, (Burt), 7, 8, 16.
[263] Exh. 56 (Baldwin July 15), at p. 12-17
[264] Exh. 13 (Frontier Supplemental Response), at 12. See also Consolidated Supplemental Response, at 11, which is similar in content (Exh. 69, at p. 11).
[265] Exh. 56 (Baldwin July 15), at pp. 16-17, citing to, among others, Exh. 78, at p. 7 stating that one of the two ways that Sprint's wireless coverage is "hampered" is "the cost of backhaul from cell sites to Sprint's network," to Exh. 78, at p. 16, stating: "BDS is critical for wireless cell site backhaul and for access to

order to serve their end user customers and so the price for that "input" affects the price that wireless carriers charge consumers. As Ms. Baldwin explains, "because there's not competition, the wireless carrier is paying too much for the input [special access back haul] and, therefore, the consumer at the end of the day who picks up the cell phone is paying too much for that cell phone plan."[266]

Even Verizon Wireless attempts to assuage concerns regarding wholesale market power by claiming that wireless and competitive carriers have sufficient alternatives. Those comments, however, are contradicted by Verizon's recent filing with the FCC where it implicitly recognized that competitive forces do not discipline special access rates:

> Verizon states: "recognizing economic challenges to new facilities-based entry at lower speeds, and for administrative ease, we agree that all Business Data Services at or below a specified threshold should be deemed *non-competitive* in all census blocks. " Moreover, Verizon supports a productivity factor for interstate special access rates, which, if markets were sufficiently competitive, would be unnecessary, stating that "there should be an annual adjustment to rates based on an X-factor of 4.4 percent minus inflation." Moreover, in its filing with the FCC, Verizon implicitly supports an analysis of special access markets at the census block level. [267]

The FCC continues to conduct a comprehensive data-driven investigation of the rates, terms, and conditions of special access services. The CPUC should not seek to replicate those

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customer premises," and to Exh. 78, at 8, stating: "Generally speaking, there are very limited alternatives to ILEC special access."

[266] RT 137: 1-6.

[267] See. Exh. 56 (Baldwin July 15), at pp. 16-17, citing Business Data Services in an Internet Protocol Environment, WC Docket No. 16-143; Special Access Rates for Price Cap Local Exchange Carriers, WC Docket No. 05-25, Letter from Verizon and INCOMPAS to Marlene H. Dortch, Secretary, Federal Communications Commission, June 27, 2016, at 2 (emphasis added) (included as Exhibit 1 to Ms. Baldwin's July 15th testimony (Exh. 56).

federal efforts, but instead fully participate in the FCC's proceeding to ensure California competitive carriers have access to wholesale inputs at reasonable terms and conditions.[268]

*3. Service Quality and IP transition*

TURN urges the Commission to heed the concerns raised by CALTEL, "The primary threats [to CLECs' continued access to unbundled network elements] are: Number one, service quality or ILEC loop maintenance practices; and two, copper retirement." [269] TURN witnesses also testified that the Commission should continue to enforce both retail and wholesale service quality standards, and should ensure that sufficient investment is made to enable continuing high-quality services at both the retail and wholesale level.[270]

When analyzing the impact of wholesale service quality on competition, the Commission should not strive merely for parity between the service quality of ILECs' retail and wholesale facilities as a way to ensure that wholesale-based competition will develop.[271] As discussed by Dr. Roycroft and Ms. Baldwin, under the current state of competition ILECs may have economic incentives to allow the quality of their retail services to decline and selective deterioration of outside plant accurately conveys information to regulators that the ILECs lack effective competition in their provision of basic dial tone service.[272] As Ms. Baldwin explains, "ILECs have allowed service quality to deteriorate significantly *despite* consumers' well-articulated

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[268] See e.g., Exh. 53 (Baldwin March 15), at p. 23; Exh. 28, at p. 33. Sprint stated with reference to the special access market: "This issue is currently under investigation by the FCC. In the interest of supporting robust retail competition in CA, Sprint would urge the Commission to engage in the debate taking place at the FCC to ensure that an outcome is achieved consistent with California residential and business customers' best interests." Ex. 55 (Baldwin June 1), at p. 40, citing -April 15 (Sprint), at 6-7. TURN similarly recommends that the Commission participate in the FCC's ongoing investigation of special access services. Exh. (Baldwin June 1), 55, p. 46.

[269] RT 24:19-22 (DeYoung).

[270] Exh. 54 (Roycroft June 1), p. 140; RT 156: 25 –157:10; Exh. 53 (Baldwin March 15), p. 35.

[271] RT 156: 25 – 157: 10; Exh. 24, at pp. 15-17 (see especially p. 17, showing that a wholesale/retail "parity" standard is insufficient for enabling efficient competition to evolve where ILECs allowing retail service quality to decline); Exh. 53 (Baldwin March 15), at 35.

[272] Exh. 56 (Baldwin July 15), pp. 20-22; Exh 54 (Roycroft June 1), p. xiv; Exh. 19 (Gallardo June 1), p. 4-6, 11-13.

preference for well-maintained dial tone lines thus suggesting that if consumers had a choice they would cancel poorly maintained services."[273] The Commission must vigilant as the availability of wholesale facilities that are offered at levels of service quality that mirrors poor service quality for retail offerings would jeopardize efficient competitive entry.

TURN also concurs with CALTEL's concerns about the potential deleterious impact of copper retirement on competition.[274] In its OII Information Request No. 16, the CPUC asks whether competitive carriers will have adequate access to network elements after the network is fully transitioned to IP-enabled technologies. The adequacy of CLECs' access to network elements post-IP-transition is uncertain at best.[275] As discussed above, in response to the OII questions, Charter and Cox noted that the ILECs were amending interconnection agreements to include more onerous terms around IP interconnection and urged the Commission to monitor this practice,

> while Charter does not have recent evidence of refusals for interconnection, this is true precisely because the Commission retains oversight of such access under its authority in sections 251 and 252 of Title 47. ILECs continue to have market power over interconnection facilities and therefore have an incentive to engage in anticompetitive conduct. *This is especially a concern as ILECs transition their networks to IP format and advocate that they should no longer have to comply with federal interconnection obligations.* Accordingly, the Commission should continue to ensure that competitors and their customers are not disadvantaged as ILECs transition their networks to IP, by continuing to oversee interconnection under sections 251 and 252 of Title 47.[276]

[273] Exh. 56 (Baldwin July 15), at 22 (emphasis in original), see generally Exh. 56 (Baldwin July 15), a pp. 20-22. See also, Ex. 53 (Baldwin March 15), at pp. 31-32 (analyzing retail service quality) and at p. 35 (analyzing wholesale service quality).
[274] RT 24: 19-22 (DeYoung); OII Information Request No. 16.
[275] Ex. 55 (Baldwin June 1), at 42-44.
[276] Exh. 40 (Sanders-April 15), p. 9, See, e.g., Exh. 55 (Baldwin June 1), at 38, citing Sanders (emphasis added

Cox echoes this concern about the potential impact of the IP transition on ILECs' willingness to enter into fair and reasonable interconnection agreements with CLECs,

> *Some large ILECs have requested, however, that in order to negotiate terms for IP-based interconnection, Cox must first agree that the agreement will not be covered by Sections 251/252 of the Act, and thereby, Cox would be foregoing any opportunity for arbitration of the agreement nor would any other CLEC have the opportunity to adopt it.* Without the Act's protections, and the FCC regulations applicable to interconnection, Cox believes that ILECs still retain substantial market power with regards to interconnection and related terms contained in interconnection agreements, and have incentive and opportunity to exercise such power.[277]

If ILECs use the IP transition as an excuse to substitute higher-priced IP-based services, such behavior would impede competition. The FCC is presently investigating the IP transition.[278] Therefore, because of the importance of the ongoing transition to new platforms and its potential impact on CLECs' ability to compete efficiently in California's telecommunications markets, the CPUC should participate in the FCC's technology transition proceeding to ensure that ILECs maintain sufficient levels of services quality and abide by rules regarding copper retirement to support wholesale-based competitive entry.

### E. Commission Must Remain Vigilant and Adopt Policies that Promote Competition and Reduce Barriers to Entry

The Scoping Memo Outline requests comment on policies and practices for the Commission to "promote competition and reduce barriers to entry." The testimony of TURN's witnesses and discussion above serve as a foundation for TURN's recommendations here. This Commission must ensure that it defines the market properly, that is has adequate and granular

[277] Exh. 55 (Baldwin June1), at 38-39, citing Cox's response to OII 14.e Cox response to 14.e (emphasis added).
[278] Exh. 55 (Baldwin June 1), at p. 42, citing the FCC's IP proceeding Technology Transitions et al., GN Docket No. 13-5 et al., Report and Order, Order on Reconsideration, and Further Notice of Proposed Rulemaking, 30 FCC Rcd 9372 (rel. 8/7/15) para. 10 (footnote omitted).

data to measure the market behavior and consumer options in the "real world," and acknowledges and addresses anticompetitive market behavior and resulting market failures. The Commission should use this proceeding to ensure it is taking all of the necessary steps to establish this foundation, including the data and metrics presented by TURN above to ensure the Commission's analysis is sufficiently comprehensive.[279] Once these findings are made, then TURN recommends the Commission consider the following policies and practices to encourage effective competition that will benefit all California consumers and reaffirm key state telecommunications policies of universal service.

In 2006, in its Uniform Regulatory Framework decision, the Commission pledged to remain vigilant in monitoring the marketplace to ensure that California customers are protected and the Commission fulfills its statutory duty.[280] TURN urges the Commission to continue this vigilance in the marketplace as a means of promoting competition and reducing barriers to competition. Just knowing that California has a policy of actively monitoring and addressing marketplace failures and barriers should encourage competitors to enter and stay in the telecommunications markets. This ongoing vigilance, starting with the findings and conclusions in this proceeding, should include a statewide review of existing state and local policies that may inhibit the construction of competing wireline networks and the development of a set of best practices that can improve conditions for market entry.[281]

Commission vigilance should also continue in the wholesale market where there is a vital role for the Commission to play as arbiter of interconnection agreements and disputes among incumbents, competitive carriers, and new entrants.[282] Moreover, active and purposeful

[279] Exh. 53 (Baldwin March 15).
[280] OII, p. 1 citing D.06-08-=030 at p. 156.
[281] Exh. 54 (Roycroft June 1), p. 135.
[282] Exh. 55 (Baldwin June 1), p. 42-44.

participation in the federal special access or Business Data Services and technology transition proceedings will also help ensure supportive conditions for new market entry as well as, again, sending a message to participants that California is investing in competition and innovation.

It is undeniable that the telecommunications marketplace is constantly evolving, making continued Commission vigilance critical to protecting California consumers. An example of this evolution lies in the numerous mergers and industry consolidation that have occurred over the past few years. Based on the conditions and sometimes vague promises made by the parties to those transactions, policy makers found that consumers stand to benefit from the promised (or ordered) out-of-territory competition, low income programs, increased service quality and wide-scale innovation. On these matters, the Commission must ensure that the *potential* for competition, innovation and other promised public benefits espoused in these mergers becomes a reality.[283]

Finally, TURN believes that proactive and affirmative regulatory policies are necessary to promote competition and reduce barriers to entry. The discussion above demonstrated that a confluence of factors underscores the importance of ongoing oversight of ILEC prices and service quality, not only to protect vulnerable and isolated populations, but to counter the anticompetitive behaviors and economic motivations of incumbent carriers discussed above. In addition, TURN's witnesses found limited choice, persistent entry barriers, broadband price trends, bundling and contracts, and broadband data caps that are not consistent with effective competition in broadband markets.[284] TURN's witnesses also expressed concern about the impact of high broadband prices on low-income consumers, who are observed to be in a position where they can only afford mobility broadband services, which are decidedly inferior for certain

[283] See, Exh. 54 (Roycroft June 1), pp. 97-98, 103, 136 (discussion of the AT&T/DIRECTV, Charter/Time Warner and Frontier/Verizon mergers.)
[284] Exh. 54 (Roycroft June 1), p. 132.

applications.[285] As a result, Dr. Roycroft also recommended that the Commission pursue measures to ensure that broadband is affordable, including the introduction of a low-income program and limits on stand-alone services to support the purchase of fixed broadband services.[286]

## V. CONCLUSION

Based on the discussion above, TURN commends the Commission for its rigorous, comprehensive, and data-driven approach to examining relevant telecommunications markets and encourages the Commission to use this data gathering and analysis effort to build a strong and comprehensive record in this proceeding. The current record demonstrates unambiguously that there is insufficient competition in California to ensure just and reasonable rates for telecommunications services. Further, it is critical for the Commission to remain vigilant and adopt proactive policies and practices that will benefit California consumers by supporting universal service, promoting competition, protecting service quality, and reducing barriers to entry.

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Respectfully submitted,

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[285] Exh. 54 (Roycroft June 1), pp. 74-75.
[286] Exh. 54 (Roycroft June 1), p. 136.