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**OF THE STATE OF CALIFORNIA**

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# PACIFIC BELL TELEPHONE COMPANY D/B/A AT&T CALIFORNIA'S (U 1001 C) OPENING COMMENTS

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Pacific Bell Telephone Company d/b/a AT&T California (U 1001 C) ("AT&T California") respectfully submits these Opening Comments in response to the Order Instituting Rulemaking Proceeding To Consider Changes to the Commission's Carrier of Last Resort Rules.[1]

# I. INTRODUCTION AND EXECUTIVE SUMMARY

## A. Introduction

Deploying cutting-edge broadband[2] networks and services across the state through massive public and private investments is the path to California's future. In contrast, the Commission's carrier of last resort ("COLR") rules date from 1996,[3] and technological innovation and the flourishing of competition across much of the state have upended many of the assumptions on which they were based. AT&T California therefore supports the Commission's decision to tackle reforming these rules to reflect these profound changes. Yet, these developments have not been felt to the same degree in every part of California. As technology continues to develop and as broadband deployment continues to unfold, we all must work together to ensure reliable voice communications remain available *everywhere*. This theme echoed resoundingly during the consideration of AT&T California's 2023 COLR Application, and AT&T California agrees.

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[1] *Ord. Instituting Rulemaking Proceeding To Consider Changes to the Comm'n's Carrier of Last Resort Rules*, R.24-06-012, 2024 Cal. PUC LEXIS 359 (June 28, 2024) ("*OIR*"). These comments address the preliminary scoped issues thematically instead of in order. Attachment A consists of a table to identify the section in which AT&T California responds to each issue.

[2] In these opening comments, AT&T California uses "broadband" to refer to both fixed and mobile broadband, absent an express reference to one or the other.

[3] *Rulemaking on Comm'n's Own Motion into Universal Serv. & To Comply with the Mandates of Assembly Bill 3643*, D.96-10-066, 1996 Cal. PUC LEXIS 1046, at *468–72 app. B (Universal Service Rules 6.D–E) (Oct. 25, 1996) ("*1996 CPUC Decision*"). The COLR rules were republished without change in 2012 when the Commission last updated the basic service definition. *See Ord. Instituting Rulemaking Regarding Revisions to the Cal. High Cost Fund B Program*, D.12-12-038, 2012 Cal. PUC LEXIS 597, at *98–100 app. C (Dec. 20, 2012) ("*2012 CPUC Decision*").

Bearing in mind the lessons from its 2023 COLR Application, AT&T California offers its initial proposals for changes to the COLR rules in these opening comments. Within this rulemaking's 18-month timeframe,[4] AT&T California recommends that the Commission reevaluate the one-size-fits-all COLR rules and refine them for three distinct categories of communities in the state: (i) areas that are well-served with broadband today because consumers with broadband service have access to voice services; (ii) areas where there are no population, no current COLR basic telephone service[5] customers, and no serviceable locations according to the Federal Communications Commission's ("FCC") National Broadband Map; and (iii) populated areas without broadband service today and, thus, no provider of voice service other than the existing COLR. It generally will be appropriate to end the COLR obligation promptly for categories (i) and (ii) while still ensuring those who rely on a voice-service safety net have one; category (iii) is more complex. Below, AT&T California presents its proposal for consideration for each of these categories.

At the same time, AT&T California fully recognizes the value of a collaborative approach to address the specialized circumstances of various local communities—among other topics—as part of this industrywide rulemaking. Nuanced policies, including to foster broadband deployment, may be important to care for the concerns of those local communities. To that end, AT&T California urges the Commission to schedule workshops in this proceeding to focus the parties to seek a fact-based consensus on the definition of these three categories and the identification of the unique requirements of particular local communities that may call for an

[4] *OIR*, 2024 Cal. PUC LEXIS 359, at *8 ("The Commission intends to complete this proceeding within 18 months of the date this decision is adopted." (citing Cal. Pub. Util. Code § 1701.5(b)).
[5] AT&T California's POTS service is an example of basic service. As noted in the *OIR*, 2024 Cal. PUC LEXIS 359, at *2, basic service was last defined by the Commission in 2012, *see 2012 CPUC Decision*, 2012 Cal. PUC LEXIS 597, at *88–97 app. A.

ongoing communications safety net. At the outset of this rulemaking, should AT&T California's proposals be adopted, AT&T California wishes to provide reassurance that, in populated areas where it is currently the COLR and there is no other voice provider, it commits to remaining the COLR until circumstances warrant a change.

### B. Executive Summary

The time has come for the Commission to reform its COLR rules to reflect the changed landscape of today's broadband era. A generation ago, when there was essentially only one voice service provider, the Commission adopted the COLR rules as a means of ensuring that all Californians would have access to affordable voice communications service. As this Commission is aware, the telecommunications industry has been transformed over the past three decades by competition, the introduction and widespread availability of new technologies and services, and changes in consumer preferences. Vastly more capable networks and devices have given rise to new modes of communication that have enriched our lives, created new economic and educational opportunities, and expanded access to a variety of vital services to the overwhelming majority of the state's population. Yet, the COLR rules remain the same as the day they were adopted—when the industry was just beginning to emerge from the legal monopoly on local phone service, analog mobile phones were still a device for early adopters, and residential dialup internet access was the cutting edge.

Communications providers have accommodated the ever-growing shift in demand by deploying competing broadband networks and services to reach, collectively, almost all Californians. Over the past few years, to supplement these investments, the federal government, in concert with California and other states, has initiated once-in-a-lifetime public funding programs to bring next-generation broadband service to hard-to-serve areas. We are in the middle of these deployment efforts, which will be unfolding while this proceeding is underway.

At their completion by the end of this decade, the objective is for all Californians—indeed, all Americans—to have access to broadband.

Although public funding will help extend broadband to harder-to-serve areas, the main driver of broadband deployment will continue to be private investment. It thus is critical that California attract as much private-sector capital as possible for network expansion to achieve its broadband goals. While AT&T California is investing billions of dollars—mostly on its own but also with public support—to expand its broadband network in the state, multiple providers offering multiple technologies must participate for the effort to succeed as efficiently as possible. Part of securing the maximum investment from all sources is setting the right regulatory incentives. California now has a unique opportunity to modernize its policies for the 21st-century broadband economy. These changes will help to propel the state into the future while still providing a safety net for the minority of residents who still must rely on legacy voice service today until they too can make the transition to broadband-enabled voice services.

This critical juncture calls for a collaborative process to address our universal service objectives through a new paradigm for 21st-century needs that can adapt to inevitable changes in technology and competition. AT&T California suggests that the following policy framework should guide these discussions:

- A redesigned COLR concept is not an end in itself. The goal is that all Californians have access to broadband service, which also enables many available voice services.
- A consumer with any fixed or mobile broadband service has access to voice services that interconnect with the public switched telephone network and support 911 calls. Therefore, a COLR generally is not needed to achieve universal access to voice service in areas that are well-served with broadband. For those areas, the Commission can reform its COLR and basic service rules while caring for certain local communities that may continue to need safety-net voice services.
- In workshops structured for seeking agreement, stakeholders can consider what factors should determine whether an area is well-served. This analysis should begin with the best available data, and the answer may not be the same everywhere. Some areas may be well-

served with a single broadband provider, particularly hard-to-serve areas with state- and federal-supported deployments that may not present an economic case for competitors.

- A COLR is not required in areas with no population, no basic telephone service customers, and no serviceable locations according to the National Broadband Map. New developments typically attract broadband providers competing to provide service. In the limited circumstances where newly populated communities remain unserved, government programs should support deployment.

- Rather than today's COLR construct, California should ensure that it has suitably funded programs to support broadband deployment in populated areas without sufficient service, including those that may not become well-served through the current federal and state broadband funding programs. While this issue exceeds the appropriate scope of this rulemaking, it provides important context for the decisions here.

- A forward-looking process should account for continuing broadband deployments in areas that currently are not well-served. Future decisions about these areas should be based on then-current data and remain flexible to accommodate inevitable technological developments.

Californians can transition to this new paradigm with confidence because, if the Commission adopts these proposals, AT&T California will remain the COLR in populated areas until they qualify as well-served with broadband. Customers will gain, not lose.

AT&T California recommends that the Commission convene workshops structured to resolve a number of these issues. By bringing together representatives of the state's diverse communities and interests, workshops can forge consensus solutions for delivering a communications safety net suited for both the 21st century and the many distinct needs of different Californians at different stages of the broadband transition. These solutions should provide special consideration, as appropriate, for people with access and functional needs, people living in areas prone to natural disaster, and other vulnerable or difficult-to-serve populations.

Finally, the Commission and all parties should focus on the future and act with urgency. Technology, the competitive landscape, and broadband availability continue to change rapidly. AT&T California looks forward to collaborating with the Commission and other stakeholders in

this effort to protect reliable voice communications everywhere while broadband services are brought to all.

AT&T California has organized the rest of these opening comments as follows: In Section II, AT&T California discusses how the substantial competition to provide broadband service throughout California warrants reform of the COLR rules (this section addresses scoping issues a and c–d). In Section III, AT&T California presents its initial proposals to reform the COLR obligation (this section addresses scoping issues a, c–d, and h–l).

## II. THE SUBSTANTIAL COMPETITION TO PROVIDE BROADBAND SERVICE IN MUCH OF CALIFORNIA WARRANTS REFORM OF THE COLR RULES.

Ensuring service to all is a public responsibility to be shared across the industry with a mix of public and private funds. In Section 254 of the federal Communications Act, Congress set out fundamental principles that telecommunications services should be available to all consumers at reasonable rates through contributions from all ratepayers.[6] Specifically, that statute requires all telecommunications providers to contribute to the Universal Service Fund to ensure that the industry broadly participates in fulfilling this goal.[7] The massive federal and state

[6] *See* 47 U.S.C. § 254(b) ("(2) … Access to advanced telecommunications and information services should be provided in all regions of the Nation. (3) … Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas. (4) … All providers of telecommunications services should make an equitable and nondiscriminatory contribution to the preservation and advancement of universal service.").

[7] *Id.* § 254(d) ("Every telecommunications carrier that provides interstate telecommunications services shall contribute, on an equitable and nondiscriminatory basis, to the specific, predictable, and sufficient mechanisms established by the Commission to preserve and advance universal service. The Commission may exempt a carrier or class of carriers from this requirement if the carrier's telecommunications activities are limited to such an extent that the level of such carrier's contribution to the preservation and advancement of universal service would be de minimis. Any other provider of interstate telecommunications may be required to contribute to the preservation and advancement of universal service if the public interest so requires."); *see also Fed.-State Joint Bd. on Universal Serv.*, Report and Order, 12 FCC Rcd. 8776, 9173 ¶ 779 (1997) ("[T]he base of contributors to universal service should be construed broadly.").

efforts to support broadband deployment emphasize the collective nature of this charge. Private investment and competition have moved the needle very far, and governments are now devoting tens of billions of dollars to closing deployment gaps because ensuring service for all is a public good and a public responsibility. Any remaining gaps will require further public resources.

In 1996, the Commission adopted the COLR rules to ensure that the end of telephony's monopoly era did not undo the achievement of ubiquitously available telephone service. However, the 1990s' liberalization of telecommunications markets did much more than open local telephone service to competition. Together with revolutions in technology, it transformed the way people communicate. We are now well into the broadband era, and it is past time to transform the COLR rules.

### A. The Monopoly-Era Roots of COLR Regulation.

Throughout most of the 20th century, consumers had one choice for voice service—the incumbent local exchange carrier ("ILEC")—and local telephone service was regulated as a natural monopoly. The COLR obligation has its economic roots in this time, when there was only one carrier and only one voice technology in any given area.[8] In the presence of such local monopoly providers, the COLR obligation ensured that no consumer could be denied service by that monopolist. Prices were typically regulated so that: (i) consumers could obtain a reasonably priced service while (ii) local monopolists could obtain a reasonable rate of return on investment. This approach is consistent with regulated monopolies being a kind of *quid pro quo*: a firm is granted the right to run the local monopoly in exchange for agreeing to requirements on service

[8] COLR regulation traces its roots to English common law and the concepts of "common carrier" and "franchise." Common carriers in many industries, including telecommunications, were essentially local monopolists that had exclusive access to customers within their franchise territories. *See*, *e.g.*, Sherry Lichtenberg, Ph.D, Nat'l Regul. Rsch. Inst., *Carrier of Last Resort: Anachronism or Necessity?* 5–7 (2016), https://pubs.naruc.org/pub/FA85B978-00A3-862C-5E8D-9E10816FA7DB.

and pricing, including the COLR obligation to provide service to any consumer in the service territory.[9]

Under this regulatory compact, the Commission authorized increases to rates to allow each ILEC, including AT&T California, to earn a reasonable overall return on investment in exchange for agreeing to serve all customers within its geographic footprint.[10] The Commission allowed above-cost rates for certain customers (*e.g.*, those in high-density urban areas) and for certain services (*e.g.*, business lines and exchange access) to support basic service rates for customers in rural and other high-cost areas that were radically below the provider's costs.[11] In the absence of competition, this system of implicit cross-subsidies generally assured each ILEC a reasonable return on its network investments as well as the ubiquitous availability of service.[12]

Incumbents lost their local monopoly status in 1996 when the federal Telecommunications Act opened local markets for competition.[13] The universal service regime subsequently broke down as competition surged, first from other providers of landline telephone services and then from rapidly escalating entry of intermodal cable and wireless providers. New entrants focused on the most-profitable customers who had once subsidized the ILECs' costs of serving unprofitable customers. As a result, ILECs were increasingly left serving the higher-cost

[9] *See* Declaration of Mark A. Israel on Behalf of AT&T ¶ 48 (Sept. 30, 2024) (appended as Attachment B) ("Israel Decl.").
[10] *See id*.
[11] *1996 CPUC Decision*, 1996 Cal. PUC LEXIS 1046, at *24 ("Prior to the opening of the local exchange and toll markets to competition, the incumbent LECs were able to offset the increased cost of doing business in high cost areas by several mechanisms. They were able to have averaged rates throughout their service territory, which enabled the LECs to set a rate which reflected an average of the higher cost exchanges with the more profitable exchanges. The LECs were also able to price certain services above costs so as to subsidize basic local exchange service, which was generally priced below cost.").
[12] Israel Decl. ¶ 48.
[13] *Id*. ¶ 48.

customers, but without the implicit cross-subsidies needed to keep those customers' rates below cost.[14]

The Commission adopted California's current COLR regime as part of a more general universal service overhaul in the 1990s, when competition for local telecommunications services was only beginning to emerge but already spelled the end of internal ILEC cross-subsidies to keep basic service rates low. To ensure a COLR was available to all Californians during this transition to local competition and to the new direct-support mechanism, the Commission initially assigned each ILEC as the COLR for its service area, while inviting other providers to opt into the COLR regime as well.[15] The Commission expected that these initial COLR classifications would be temporary: "As the marketplace for local telephone exchange service moves from a monopoly provider to multiple providers, the universal service program needs to be readjusted to meet the challenges of increasing competition."[16] Indeed, the Commission intended to select a new COLR for an area every three years.[17] The Commission further emphasized that the COLR obligation should be "[c]ompetitive[ly] neutral[]," and "regulation of the telecommunications industry should be structured in such a way that it neither favors nor impedes one telecommunications carrier or group of telecommunications carriers, over any other carrier or group of carriers," including incumbents.[18]

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[14] *1996 CPUC Decision*, 1996 Cal. PUC LEXIS 1046, at *24 ("With the introduction of competition, multiple carriers will be competing for the same customers. The implicit subsidies of averaged rates, and services priced above cost to support services priced below cost, will no longer be sustainable in a competitive market."); *see* Israel Decl. ¶ 49.
[15] *1996 CPUC Decision*, 1996 Cal. PUC LEXIS 1046, at *468–69 (Rule 6.D.1).
[16] *See id.* at *369 (Finding of Fact 16).
[17] *See id.* at *329 (explaining that the auction mechanism that was to be created pursuant to the COLR rules would commence "in about three years" following the adoption of the *1996 CPUC Decision*, implying that the initial COLR term was to be approximately three years).
[18] *Id.* at *455 (Rule 1.J).

The Commission recognized the need to replace its legacy internal cross-subsidy system with an external direct-support mechanism, among other revisions.[19] The Commission thus created the California High Cost Fund-B ("CHCF-B Fund"), funded by fees assessed on the end-user customers of all telecommunications providers, to provide direct support to any provider serving a high-cost customer.[20] To qualify for this support, a carrier must be a COLR, which requires it to offer tariffed, basic voice telephone service to any requesting customer in the carrier's service area.[21]

### B. The 1996 COLR Rules Do Not Reflect the Broadband Era.

Fast forward to the present, and much of California enjoys plentiful alternatives to an ILEC's POTS service delivered over a legacy time-division multiplexing ("TDM") network composed of copper lines and antiquated circuit switches.[22] Indeed, consumers now have access to—and overwhelmingly prefer—broadband services over cable, including from national providers like Charter and Comcast; fiber from providers like AT&T, Sonic, and Consolidated; fixed wireless from T-Mobile, Verizon, AT&T Mobility, and numerous smaller providers; and ubiquitous mobile wireless from the three national providers, and DISH, which is deploying

[19] *Id.* at *2 ("As we enter this competitive environment, yesterday's policies supporting universal service will no longer be sustainable."); *see also* S. Rep. No. 104-23, at 28 (1995) ("In a monopoly environment this requirement took the form of an obligation to provide service throughout an entire area; in the competitive environment of the future it may not be necessary or desirable to meet the requirement to provide universal service by imposing on all telecommunications providers the obligation to provide service throughout an entire area. Instead, the public interest may be better served by having carriers contribute to a fund or other support mechanisms which would be used to provide support payments to one or more telecommunications carriers that agree to undertake the service obligation that might otherwise be imposed on all providers.").
[20] *See 1996 CPUC Decision*, 1996 Cal. PUC LEXIS 1046, at *3–4.
[21] *Id.* at *293, *300–09.
[22] *2022 Commc'ns Marketplace Rep.*, 37 FCC Rcd. 15514, 15634 ¶ 168 (2022) ("*2022 Commc'ns Marketplace Rep.*") ("Although the public switched telephone network used to be the only means to connect, there now exist many other voice service options for consumers in the United States.").

aggressively to meet its buildout requirements.[23] Technological developments will lead to additional alternatives. In this environment, it is counterproductive to continue the COLR requirement for the vast majority of Californians for whom several providers compete to offer broadband service.

*First*, the COLR obligation, where it is unnecessary, harms residents and businesses by diverting resources from investment in broadband to maintenance of TDM networks and related services, which fewer and fewer customers even want. As the FCC has explained, removing legacy universal service obligations "at least incrementally is likely to free up service provider funds for broadband investment."[24] Each dollar ILECs spend on legacy networks and services in areas with broadband is a dollar they do not have to invest in broadband deployment elsewhere in California.[25] Preserving the COLR obligation will delay unserved and underserved Californians' enjoyment of broadband's myriad benefits.

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[23] *See Applications of T-Mobile US, Inc., & Sprint Corp., for Consent To Transfer Control of Licenses & Authorizations,* et al., Order, 34 FCC Rcd. 10578, 10830–31 app. H (2019) (setting forth DISH commitments to deploy 5G service to at least 70% of the U.S. population by June 2023 and 5G broadband service to at least 75% of the population in each Partial Economic Area no later than June 2025); Letter from Joel Taubenblatt, Chief, Wireless Telecomms. Bureau, FCC, to Jeffrey Blum, Exec. Vice President, External & Legis. Affs., DISH (Sept. 29, 2023) ("Taubenblatt Letter"), https://docs.fcc.gov/public/attachments/DOC-397375A1.pdf (explaining that, as of July 2023, DISH had met its band-specific 5G deployment commitments and nationwide 5G commitments); Letter from Jeffrey Blum, Exec. Vice President, External & Legis. Affs., DISH, to Joel Taubenblatt, Chief, Wireless Telecomms. Bureau, FCC (Sept. 17, 2024) ("Blum Letter"), https://www.fcc.gov/ecfs/document/1091867842711/1 (requesting an extension of the construction milestones associated with certain licenses contingent on DISH complying with new commitments, including covering over 80% of the U.S. population with 5G broadband service by the end of 2024, acceleration and expansion of the 5G broadband coverage to 85% in certain license areas by the end of 2024, and deploying 9,000 towers more than the 2023 tower commitment); *FCC Grants EchoStar's 5G Buildout Framework for the Boost Mobile Network*, EchoStar (Sept. 20, 2024), https://ir.echostar.com/news-releases/news-release-details/fcc-grants-echostars-5g-buildout-framework-boost-mobile-network ("*EchoStar Extension Approval*") (announcing that the FCC had granted EchoStar's Sept. 17, 2024 extension request with conditions).

[24] *Lifeline & Link Up Reform & Modernization*, Third Report and Order, 31 FCC Rcd. 3962, 4084 ¶ 337 (2016) ("*2016 Lifeline Order*").

[25] *See* Israel Decl. ¶¶ 53, 55.

*Second*, as Dr. Israel explains, consumers suffer because the COLR obligation reduces competitive intensity for modern communications services by arbitrarily constraining ILECs alone. Where there is competition, regulating only one provider is inherently distortionary.[26] Ending this distortion should spur greater investment by competing providers. In the end, all "[c]onsumers in California would benefit from such enhanced competitive pressure and the associated improvement in allocation of investment dollars."[27]

For this reason, federal and California universal service policies have correctly emphasized competitive neutrality. Section 254 of the federal Communications Act requires states to distribute the burdens of ensuring universal service "on an equitable and nondiscriminatory basis."[28] In implementing this statute, the FCC explained that "competitive neutrality" must be a guiding principle for "the preservation and advancement of universal service."[29] According to the Commission, Section 254's "requirements to apply universal service on an equitable, nondiscriminatory, and competitively neutral basis are echoed in enabling statutes for implementing California's universal service mandate."[30] Indeed, when it created the COLR regime in 1996, the Commission intended it to be competitively neutral.[31] After three decades of profound changes, requiring ILECs alone to bear the cost of providing basic service

[26] *See id*. ¶¶ 55, 58.
[27] *Id*. ¶ 58.
[28] 47 U.S.C. § 254(f) ("Every telecommunications carrier that provides intrastate telecommunications services shall contribute, on an equitable and nondiscriminatory basis, in a manner determined by the State to the preservation and advancement of universal service in that State."); *id.* § 254(b)(4) ("All providers of telecommunications services should make an equitable and nondiscriminatory contribution to the preservation and advancement of universal service.").
[29] *Fed.-State Joint Bd. on Universal Serv.*, 12 FCC Rcd. at 8801 ¶ 46 (relying on 47 U.S.C. § 254(b)(7)). It thus held that "universal service support mechanisms and rules [must] neither unfairly advantage nor disadvantage one provider over another." *Id.* at 8801 ¶ 47.
[30] *Ord. Instituting Rulemaking To Consider Whether Text Messaging Servs. Are Subject to Pub. Purpose Program Surcharges*, D.19-01-029, 2019 Cal. PUC LEXIS 59, at *4 (Feb. 9, 2019) (citing Cal. Pub. Util. Code § 871.5).
[31] *See supra* page 9.

throughout their respective territories is not equitable, nondiscriminatory, or competitively neutral.

*Third*, copper networks consume massive amounts of electricity. Because fiber networks use unpowered (passive) optical splitters and generate less heat overall (thereby requiring less cooling), replacing copper with fiber improves energy efficiency by over two thirds.[32] Modern IP switches are very efficient and can be housed in much smaller facilities with correspondingly smaller energy needs than the huge facilities that legacy TDM switches require.[33] As this Commission knows all too well, California needs all the load reduction that can be accomplished.[34] Moreover, fiber networks also require less maintenance than older copper networks.[35] Less maintenance means fewer truck rolls to repair sites and thus less consumption

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[32] *See ABI Research Identifies 30 Sustainability Action Items for Telco Operators*, ABI Rsch. (Apr. 21, 2022), https://www.abiresearch.com/press/purchasing-renewable-energy-removes-co2-emissions-equal-to-20-million-barrels-of-oil-a-year-for-leading-telco-operators/ ("replace copper with fiber (85% improved efficiency)"); Javier Gil Gómez et al., *The Growing Imperative of Energy Optimization for Telco Networks*, McKinsey & Co. (Feb. 23, 2024), https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/the-growing-imperative-of-energy-optimization-for-telco-networks; Karim Taga et al., Arthur D. Little, *Copper Switch Off: Opportunity To Drive Infrastructure Coverage?* 7 (2021), https://www.adlittle.com/sites/default/files/reports/ADL_Copper_SwitchOff.pdf.

[33] Tom Wheeler, Chairman, FCC, Prepared Remarks of FCC Chairman Tom Wheeler, The Brookings Institution (June 26, 2015), https://docs.fcc.gov/public/attachments/DOC-334141A1.pdf (noting that software defined networks "can save up to 60 percent on energy costs").

[34] *See*, *e.g.*, *Ord. Instituting Rulemaking To Establish Pol'ys, Processes, & Rules To Ensure Reliable Elec. Serv. in Cal. in the Event of an Extreme Weather Event in 2021*, D.21-03-056, 2021 WL 1240280, at *1, *5 (Cal. P.U.C. Mar. 25, 2021) (addressing the imbalance between electricity peak supply and demand).

[35] *See* Melanie Weir, *A Guide to Fiber Optics, and How Fiber-Optic Networks Are Improving Data Transfer*, Bus. Insider (Mar. 17, 2021, 2:41 PM), https://www.businessinsider.com/guides/tech/fiber-optic (explaining that fiber strands take "much longer to break down than a natural substance like copper," so "they need much less maintenance, which means fewer service interruptions and less construction in general"); Kara Mullaley, *When To Transition from Copper to Fiber*, Broadband Cmtys., Aug.–Sept. 2019, at 55, https://bbcmag.com/when-to-transition-from-copper-to-fiber-2/ (explaining that "[m]aintaining a copper network is inherently more expensive" than maintaining a fiber network because "[f]iber is not nearly as susceptible to water, salt and other external factors that impact copper networks, often leading to service degradation and associated trouble reports" and noting that "[h]eavy rain often leads to a spike in trouble tickets and truck rolls—or even multiple truck rolls" for copper networks); Jim Hayes, *Fiber Optic Network Operation, Maintenance, and Restoration*, NETA World (Nov. 1, 2019), https://netaworldjournal.org/fiber-optic-network-operation-maintenance-and-restoration/ (explaining that "fiber optic cable plants are very reliable and need no routine maintenance").

of fossil fuels.[36] Similarly, software-defined broadband networks generally do not require new construction or technician visits to increase the capacity delivered to subscribers,[37] further reducing energy demand over the long run.

Ultimately, California's residents lose from prolonging the COLR obligation where it is unnecessary for the communications safety net. Removing it would promote competition, further investment in new broadband technologies, job creation, and better environmental outcomes. There are ways to remove the COLR obligation generally while preserving basic service availability to those who have no alternative. The Commission should strive to achieve this balance through this rulemaking.

### C. The Vast Majority of California Consumers Use and Demand Broadband Service, Not POTS.

The overwhelming majority of consumers have voted with their wallets, cutting the cord to the landline TDM network and opting instead for the many mobile and fixed broadband services available to them.[38] Eight and one-half percent of U.S. households subscribed to POTS

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[36] *See* Barry Walton, *Cost Calculations of Fiber and Copper*, Corning, https://www.corning.com/fiber-to-the-premise/worldwide/en/home/knowledge-center/cost-calculations-of-fiber-and-copper.html (last visited Sept. 27, 2024) ("*Corning Cost Calculations*") ("[C]opper-based broadband service can be less reliable and often requires several repeat truck rolls with technicians of various skill sets to carry out the frequent repairs needed to maintain service speeds."); Yanitsa Boyadzhieva, *TalkTalk Finds Fibre Networks Will Cost the Planet Much Less Than Copper*, TelecomTV (Apr. 8, 2022), https://www.telecomtv.com/content/sustainability/talktalk-finds-fibre-networks-will-cost-the-planet-much-less-than-copper-44136/ (reasoning that fiber is more resilient than copper, and this results in "fewer faults and 'dramatically' less need for engineers to be sent to fix the networks" and in "lower carbon footprint through reduced transportation costs").

[37] *See*, *e.g.*, Linda Hardesty, *AT&T Upgrades Its Fiber Network To Offer 2-Gig, 5-Gig Speeds*, Fierce Telecom (Jan. 24, 2022), https://www.fiercetelecom.com/broadband/att-upgrades-its-fiber-network-offer-2-gig-5-gig-speeds.

[38] *See generally 2012 CPUC Decision*, 2012 Cal. PUC LEXIS 597, at *74–75 (Finding of Fact 5) ("Although basic service has traditionally been provided by carriers using local exchange wireline network architecture, other forms of telecommunications services offered by wireless, cable, and VoIP have been growing in popularity, particularly over the past decade."). According to federal estimates as of 2022, only 2.2% of California adults were "landline-only" (*i.e.*, POTS or broadband VoIP), and only 2.2% were "landline-mostly"; the remainder relied equally (5.9%), mostly (15.4%), or exclusively (73%) on their wireless phones. *National Health Interview Survey Early Release Program*, Nat'l Ctr. for Health

in 2022, as compared to 96 percent in 2005—an "enormous" 87.5-percentage-point decline over 17 years.[39] AT&T California's POTS penetration is even lower at 4.8 percent in December 2023,[40] and AT&T California lost 93 percent of its POTS lines from 2000 to 2023,[41] even as California's population grew by almost 15 percent[42] and housing units by 19 percent during that same period.[43] Nor does the decline in POTS subscribership show any sign of slowing.[44]

Voice services over fixed and mobile broadband services are not only reasonable alternatives to POTS for the vast majority of Californians with broadband access; they are in fact technologically superior and available at comparable or lower prices. Comcast and Cox, for example, offer standalone voice over internet protocol ("VoIP") services that cost less than AT&T California's POTS service and include unlimited local and long-distance calling.[45]

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Stat. (2024), https://www.cdc.gov/nchs/data/nhis/earlyrelease/Wireless_state_202406.pdf ("*National Health Interview Survey*"). The wireless substitution trend has been steady even on the national level. As of December 2023, preliminary federal estimates indicate that 76% of U.S. adults lived in "wireless-only" households and only about 1.3% of U.S. adults lived in "landline-only" households. Stephen J. Blumberg, Ph.D., & Julian V. Luke, Nat'l Ctr. for Health Stat., *Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, July-December 2023* 1–5 (2024), https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless202406.pdf.

[39] Israel Decl. ¶ 18.

[40] *Id.*

[41] *Id.* ¶ 20.

[42] *Compare DP1: Profile of General Demographic Characteristics: 2000*, U.S. Census Bureau, https://data.census.gov/table/DECENNIALDPAIAN2000.DP1?q=california%20population%202000 (last visited Sept. 27, 2024) (noting that California's population in 2000 was around 34 million) *with DP05: ACS Demographic and Housing Estimates*, U.S. Census Bureau, https://data.census.gov/table?q=california%20population%202023 (last visited Sept. 27, 2024) (noting that California's population in 2023 was around 39 million).

[43] *Compare* U.S. Census Bureau, *2000 Census of Population and Housing, Summary Population and Housing Characteristics, PHC-1-6, California* 174 tbl. 7 (2002) (showing that California's household total in 2000 was around 12 million), https://www2.census.gov/library/publications/2002/dec/phc-1-6.pdf *with DP02: Selected Social Characteristics in the United States*, U.S. Census Bureau, https://data.census.gov/table/ACSDP1Y2023.DP02?q=california%20household%202023 (last visited Sept. 27, 2024) (noting that California's household total in 2023 was around 14 million).

[44] *See generally 2022 Commc'ns Marketplace Rep.*, 37 FCC Rcd. at 15635 ¶ 170 (noting that "[t]he number of fixed retail switched-access lines declined [nationwide from December 2018 to December 2021] at a compound annual rate of 12.3" percent "while interconnected VoIP services continue[d] to increase").

[45] Israel Decl. ¶ 35 & n.32, tbl. 3 (Comcast and Cox offer unbundled VoIP service at $30/month and $20/month, as opposed to AT&T California POTS at $37.50/month).

Likewise, T-Mobile, Verizon Wireless, and AT&T Mobility all offer plans that include nationwide calling at prices less than or comparable to AT&T California's POTS service.[46] Resellers offer mobile wireless service that is less costly still.[47] More than a dozen mobile wireless providers—both facilities-based and resellers—offer Lifeline services throughout the state.[48] Indeed, the overwhelming majority of California Lifeline subscribers choose mobile over POTS.[49]

Mobile wireless services also come with technological advantages over POTS that increase their value to consumers. Most obviously, they are *mobile*: a customer can make and receive calls outside the home. Likewise, when customers move, they do not have to cancel and initiate new service, nor do they have to change phone numbers. Mobile wireless is also almost always bundled with features like long distance service, voicemail, caller ID, three-way calling,

[46] *Id*. ¶ 36 & tbl. 4 (AT&T California POTS costs $37.50/month; T-Mobile service starts at $40/month, Verizon Wireless at $35/month, and AT&T Mobility at $33/month).
[47] *Id.* ¶¶ 36–38.
[48] For example, Assurance Wireless (with approximately 120,000 LifeLine subscribers) and TracFone (with approximately 212,000) are brands of facilities-based providers T-Mobile and Verizon Wireless, respectively. *See California LifeLine Related Forms and Notices for Carriers*, Cal. Pub. Utils. Comm'n, https://www.cpuc.ca.gov/consumer-support/financial-assistance-savings-and-discounts/lifeline/lifeline-related-forms-and-notices-for-service-providers (last visited Sept. 13, 2024) ("Maximus Lifeline Data") (choose "2024" under "THIRD PARTY ADMINISTRATOR LIFELINE CUSTOMER COUNTS" to access data in Excel file) (listing carriers' LifeLine subscribers by month). Other large mobile wireless LifeLine providers are TruConnect (with approximately 520,000) and Infiniti Mobile (with approximately 143,000). *See id.* All four have Eligible Telecommunications Carrier ("ETC") designations, *see* Cal. Pub. Utils. Comm'n Resol. T-17388 (Feb. 28, 2013); Cal. Pub. Utils. Comm'n Resol. T-17467 (Aug. 13, 2015); Cal. Pub. Utils. Comm'n Resol. T-17587 (Mar. 1, 2018); Cal. Pub. Utils. Comm'n Resol. T-17729 (June 3, 2021), meaning they must provide Lifeline service, *see* 47 C.F.R. § 54.405(a); *see also What Is the Lifeline Assistance Program?*, Assurance Wireless, https://www.assurancewireless.com (last visited Sept. 13, 2024); *Government Discount Programs Can Cut Big Dollars Off Your Cellular Plan*, Tracfone, https://www.tracfone.com/gdp (last visited Sept. 13, 2024); *About the Lifeline Program*, TruConnect, https://www.truconnect.com/program/about-lifeline (last visited Sept. 13, 2024); *Why Choose Infiniti Mobile?*, Infiniti Mobile, https://infinitimobile.com (last visited Sept. 27, 2024).
[49] *See* Maximus Lifeline Data (indicating that, as of July 2024, there were more than 1.4 million mobile LifeLine customers and fewer than 130,000 wireline LifeLine customers).

and text messaging that are not included with basic telephone service.[50] In the vast majority of mobile wireless plans, voice service is simply an add-on to the primary broadband data service.[51]

Mobile wireless service is also highly reliable. Current wireless voice technology offers substantially better sound and other quality dimensions than earlier versions.[52] Georgetown Professor John Mayo explains:

> In the past 20 years, the number of cell sites deployed has tripled, increasing by more than 300,000 cell sites, with substantial improvements to cellphone coverage areas and reduction of dropped calls. Service that was limited to cities and major roadways twenty years ago now extends to the vast geographic regions of the country. This expansion has substantially enhanced the quality of mobile wireless service.[53]

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[50] Israel Decl. ¶ 21.

[51] *Id.* ¶ 36 & tbl. 4 (the lowest cost T-Mobile and AT&T plans include a data allowance).

[52] *See* Dongwook Kim, 3GPP MCC, *Communication Services (VoLTE/VoNR)*, 3GPP (Jan. 5, 2024), https://www.3gpp.org/technologies/volte-vonr (noting that VoLTE/VoNR "provid[e] much clearer and more natural voice experience during calls" than legacy services); *UK Operators Continue To Improve the End-User Mobile Call Experience*, RootMetrics (May 24, 2022), https://rootmetrics.com/en-GB/content/UK-mobile-call-trends-2022 (explaining that VoLTE provides "[c]rystal-clear voice quality" and "VoNR should result in even faster call setup times, improved voice quality, and better call reliability"); *VoLTE: How To Use It and Why You Should Care*, Android Central, https://www.androidcentral.com/volte (June 24, 2024) (stating that VoLTE can "use more bandwidth to make phone calls with higher-quality audio that can easily travel both ways"); *Let's Talk Voice*, Ericsson, https://www.ericsson.com/en/volte/lets-talk-voice (last visited Sept. 13, 2024) ("The audio quality in mobile voice calls has evolved since the introduction of 2G mobile networks, with improvements in voice coding technologies in mobile networks and mobile phones. In 2G and 3G networks, first there was narrowband voice quality (NB, usually 13.2 kbps). Then HD voice (AMR-WB, usually 13.2 kbps) was introduced, mainly in 3G networks. With 4G, HD voice became the default … ."); *Five Benefits of VoLTE over Traditional CS Voice Calls*, GSMA (June 14, 2022), https://www.gsma.com/membership/resources/five-benefits-of-volte-over-traditional-cs-voice-calls/ ("VoLTE offers higher voice quality than legacy circuit switched voice. … VoLTE provides voice in wider range of frequency and enhances the voice quality significantly.").

[53] John W. Mayo, *The Evolution of Welfare in the Mobile Wireless Service Industry* 2 (2024), https://api.ctia.org/wp-content/uploads/2024/01/Mayo-Paper_Final.pdf (citing *Mobile LTE Coverage Map*, Fed. Commc'ns Comm'n, https://www.fcc.gov/BroadbandData/MobileMaps/mobile-map (last visited Sept. 30, 2024)).

Even over the past decade, a marked improvement in mobile wireless network quality has occurred.[54] Surveys confirm that consumers have recognized the difference.[55] While some might contend that POTS still offers better call quality, consumers resoundingly have reached the opposite view: as noted, the overwhelming majority primarily use mobile wireless service for voice calls.[56]

VoIP and mobile voice services are more reliable and safer than traditional POTS. Because of its inherent efficiencies, VoIP offers higher service quality.[57] Fiber-based VoIP is even more reliable than services delivered over copper last-mile connections,[58] providing still greater security in emergencies. Moreover, interconnected VoIP services must meet the FCC's Enhanced 911 ("E911") requirements, providing the caller's callback number and, in most cases,

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[54] *See* Bryan Keating, Compass Lexecon, *An Economic Analysis of Mobile Wireless Competition in the United States* 2 (2023), https://www.ctia.org/news/compass-lexecon-competition-report ("Capital investment in cell site densification and coverage increases network capacity and improves network quality. This led to a 64 percent increase in the number of active cell sites over the past decade. Each of the three main facilities-based carriers offers wireless coverage accounting for at least 98 percent of the population.").

[55] *See*, *e.g.*, Am. Customer Satisfaction Index, *ACSI Wireless Phone Service and Cell Phone Study 2023-2024* (2024), https://theacsi.org/wp-content/uploads/2024/05/24may-cell-wireless-study-FINAL.pdf (reflects improving call quality and network capability between 2023 and 2024); *Press Release Wireless Service and Cellular Telephones 2018-2019*, ACSI (June 4, 2019), https://theacsi.org/news-and-resources/press-releases/2019/06/04/press-release-wireless-service-and-cellular-telephones-2018-2019/ (noting that customer satisfaction with the wireless telephone industry increased from the previous year); *Press Release Wireless Phone Service and Cell Phones 2020-2021*, ACSI (May 18, 2021), https://theacsi.org/news-and-resources/press-releases/2021/05/18/press-release-wireless-phone-service-and-cell-phones-2020-2021/ (noting that customer satisfaction with wireless service and network quality remains steady).

[56] *See National Health Interview Survey*.

[57] *See* Kiely Kuligowski, *Is a VoIP or Landline System Better for Your Business?*, Bus. News Daily (Sept. 6, 2024), https://www.businessnewsdaily.com/15323-voip-vs-landline.html ("Sound is usually clearer with VoIP than with analog phone lines, but this too depends on your internet connection. A slow connection can negatively affect the quality of your call, but a strong connection typically results in clear, consistent sound quality.").

[58] *See Corning Cost Calculations* ("[C]opper-based broadband service can be less reliable and often requires several repeat truck rolls with technicians of various skill sets to carry out the frequent repairs needed to maintain service speeds.").

location information to emergency service personnel.[59] Looking to the future, California is migrating to a Next Generation 9-1-1 ("NG911") System, which will enhance emergency number services to create a faster, more resilient system. NG911 features an all-IP platform that can receive voice, text, data, photo, or video information. According to the California Office of Emergency Services, this upgrade is a significant benefit to first responders and the communities they serve.[60] The FCC, likewise, has found: "[T]he NG911 transition will improve the reliability of the 911 system, and thus improve public safety. Accelerating the implementation of NG911 will reduce the likelihood of 911 service outages because it will facilitate deployment of new facilities to replace the aging and failure-prone infrastructure used to operate the legacy 911 system."[61] Legacy POTS networks, however, cannot support NG911.

Mobile wireless has safety advantages over POTS too. Like interconnected VoIP providers, mobile wireless carriers are also subject to the FCC's 911 regulations, including location-accuracy requirements,[62] and mobile wireless networks will support NG911.[63] Access to a mobile phone outside the home as well as inside increases safety, ensuring consumers can call for help whenever they encounter an emergency, and when fleeing one. In addition, mobile wireless phones remain functional when home power goes out, whereas many subscribers to landline POTS service rely on cordless phones that stop functioning immediately. According to

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[59] *See generally Making 911 Emergency Calls*, AT&T, https://www.att.com/support/article/u-verse-voice/KM1002114/ (last visited Sept. 15, 2024).
[60] *What Is Next Generation 9-1-1?*, Governor's Off. of Emergency Servs., https://caloes-next-gen-9-1-1-calema.hub.arcgis.com/pages/background (last visited Sept. 16, 2024).
[61] *Facilitating Implementation of Next Generation 911 Services (NG911);* et al., PS Docket Nos. 21-479 et al., Report and Order, 2024 FCC LEXIS 1998, at *285–86 ¶ 185 (rel. July 19, 2024) ("*2024 NG911 Order*"); *see id.* at *287 ¶ 186 ("Today's rules will accelerate the full retirement of the legacy TDM-based 911 system and facilitate use of an NG911 architecture that uses newer and less failure-prone facilities.").
[62] 47 C.F.R. § 9.10.
[63] *2024 NG911 Order*, 2024 FCC LEXIS 1998, at *1–2 ¶ 2 (requiring interconnected VoIP and mobile wireless providers "to take actions to start or continue the transition to NG911 in coordination with 911 Authorities").

the AARP, "you now can switch from your copper-wire landline to wireless in relative safety."[64] Additionally, "911 support for cellphones and online calls has improved because of advancements in phones, GPS technology, carrier services and dispatching equipment."[65] Mobile devices also offer emergency alerts, providing time to get out of danger.

Consumers with disabilities also have their needs met by mobile wireless and VoIP services. The FCC has adopted accessibility regulations for mobile wireless and interconnected VoIP services, including rules requiring mobile wireless device manufacturers and providers to offer a minimum number of devices compatible with hearing aids.[66] AT&T Mobility offers many such devices,[67] as do the other mobile wireless carriers.[68] Some of these devices can directly connect a smartphone to a hearing aid, and some newer hearing aids are specifically designed to connect directly to a smartphone using Bluetooth.[69] AT&T's interconnected VoIP service is compatible with TTY, and the interconnected VoIP industry has developed standards and implemented technology interoperable with TTY devices. Moreover, the FCC's rules include

[64] John R. Quain, *Is It Safe To Get Rid of Your Landline?*, AARP, https://www.aarp.org/home-family/personal-technology/info-2020/get-rid-of-landline.html (Jan. 2, 2024).
[65] *Id.*
[66] *See* 47 C.F.R. § 20.19; *Hearing Aid Compatible Mobile Handsets*, Fed. Commc'ns Comm'n, https://www.fcc.gov/hearing-aid-compatibility-wireless-telephones (last visited Sept. 15, 2024).
[67] *See Find Wireless Phones for Hearing Aids*, AT&T, https://www.att.com/support/article/wireless/KM1207494/ (last visited Sept. 15, 2024).
[68] *See*, *e.g.*, *Hearing Aid Compatible Products*, Verizon, https://myverizonid.verizon.com/aboutus/accessibility/products.html (last visited Sept. 15, 2024); *T-Mobile Accessibility*, T-Mobile, https://www.t-mobile.com/responsibility/consumer-info/accessibility-policy (last visited Sept. 15, 2024); *Accessibility & Hearing Aid Compatibility*, U.S. Cellular, https://www.uscellular.com/support/accessibility-hearing-aid (last visited Sept. 15, 2024); *Hearing Aid Compatible Phones*, DISH, https://www.boostmobile.com/content/dam/boost/web/en/docs/bm_legaldocs_2024/HearingAidCompatiblePhones.pdf (Aug. 13, 2024).
[69] *See Using Your Mobile or Smartphone*, RNID, https://rnid.org.uk/information-and-support/technology-and-products/using-your-mobile-or-smartphone/ (last visited Sept. 15, 2024).

accessibility requirements for both mobile and interconnected VoIP service providers, including 711 dialing for access to relay services.[70]

Beyond these voice-service benefits, mobile wireless and fixed VoIP come with broadband service, which enables real-time spoken communications at no or little cost from applications such as highly popular platforms like Zoom, WhatsApp, Skype, Microsoft Teams, FaceTime, Vonage, and Google Voice.[71] Consumers also demand broadband service because, in addition to enabling voice communications, it is vital for participation in modern society. As this Commission put it, "[b]roadband access enables individuals, including in rural communities and Tribal communities, to work, study, communicate, apply for government services, operate homebased businesses, receive emergency information, and access health care."[72] Millions of

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[70] *See* 47 C.F.R. §§ 6.1–6.16, 7.1–7.16, 64.601(b); *see generally Dial 7-1-1 for Relay Services*, AT&T, https://www.att.com/support/article/u-verse-voice/KM1010572/ (last visited Sept. 15, 2024).

[71] *See Individuals & Business*, Zoom, https://zoom.us/pricing (last visited Sept. 16, 2024) (free for individuals and paid plans start at $13.32); *About WhatsApp*, WhatsApp, https://www.whatsapp.com/about (last visited Sept. 16, 2024) (free for individual users); *How Much Does It Cost To Call Mobiles and Landlines from Skype?*, Microsoft, https://support.microsoft.com/en-au/skype/how-much-does-it-cost-to-call-mobiles-and-landlines-from-skype-e0750859-8e92-4c86-acc4-5e464db939bb#:~:text=Skype%20to%20Skype%20calls%20are,country%20you're%20calling%20from%20 (last visited Sept. 16, 2024) (Skype-to-Skype calls are free, and international calling rates start at 2.3 cents/minute); *Find the Right Microsoft Teams for Your Needs*, Microsoft, https://www.microsoft.com/en-us/microsoft-teams/compare-microsoft-teams-home-options (last visited Sept. 16, 2024) (free for individuals, and business plans start at $4 per user per month); *FaceTime*, App Store Preview, https://apps.apple.com/us/app/facetime/id1110145091 (last visited Sept. 16, 2024) (available for free for Apple devices); *Nationwide & International Calling Plans*, Vonage for Home, https://www.vonageforhome.com/plans/ (last visited Sept. 16, 2024) (home plans start at $9.99 per month); *Simple, Reliable, Effective Business Communications*, Vonage, https://www.vonage.com/unified-communications/pricing/ (last visited Sept. 16, 2024) (business plans start at $13.99 per line per month); *Set Up Google Voice*, Google Voice Help, https://support.google.com/voice/answer/115061?hl=en&co=GENIE.Platform%3DDesktop (last visited Sept. 16, 2024) (basic features free for individuals); *Google Voice: Business Phone System & Plans*, Google Workspace, https://workspace.google.com/products/voice/#pricing-plans (last visited Sept. 16, 2024) (business plans start at $10 per user per month).

[72] Cal. Pub. Utils. Comm'n, *State of California Five-Year Action Plan Broadband Equity, Access, and Deployment (BEAD) Program* 6 (2023), https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M513/K977/513977116.PDF; *see also Ord. Instituting Rulemaking Regarding Broadband Infrastructure Deployment & To Support Serv. Providers in the State of Cal.*, R.20-09-001, 2020 Cal. PUC LEXIS 886, at *7–8 (Sept. 10, 2020) ("The COVID-19 pandemic has highlighted the extent to which broadband access is essential for public safety, public health

people now work from home,[73] and some jobs require remote work.[74] Education increasingly has moved online—from research tools[75] to instructional websites[76] to homework platforms[77] to tutoring services[78] to entire courses and degree programs.[79] Broadband also plays an ever-more-important role in access to important services like enrolling for government benefits,[80] renewing

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and welfare, education, and economic resilience. … More Californians are telecommuting from their places of residence and millions of children are attending classes remotely.").

[73] *Remote Work Statistics and Trends in 2024*, USA Today (Apr. 3, 2024), https://www.usatoday.com/money/blueprint/business/hr-payroll/remote-work-statistics/#sources (stating that "22 million employed adults (aged 18 and over) in the U.S. work from home all the time, equal to roughly 14% of all employed adults," and even more work part-time remote on a hybrid setup).

[74] *Remote Work Statistics and Trends in 2024*, Forbes Advisor (June 12, 2023), https://www.forbes.com/advisor/business/remote-work-statistics/ (noting that "[a]bout 16% of companies are already fully remote, operating without a physical office").

[75] *See* Rachel Bartee, *22 Online Research Tools Every College Student Should Know About*, CollegeRaptor (Dec. 22, 2022), https://www.collegeraptor.com/find-colleges/articles/tips-tools-advice/22-online-research-tools-every-college-student-know/ (discussing various online research tools that aid students in the research and information collection process, including iSeek, Academia, World Digital Library, and ResearchGate).

[76] *See*, *e.g.*, Coursera, https://about.coursera.org/ (last visited Sept. 15, 2024) (providing "flexible, affordable, job-relevant online learning to individuals and organizations worldwide"); *Fueling the World's Ambition*, edX, https://www.edx.org/about-us (last visited Sept. 15, 2024) (online learning platform that "delivers real professional progress across nearly every career discipline, from artificial intelligence and robotics to sustainability and public health").

[77] *See*, *e.g.*, *Built by Teachers*, DeltaMath, https://www.deltamath.com/about/ (last visited Sept. 15, 2024) (allowing teachers to create assignments and track student learning); *Create an Assignment*, Google Classroom, https://support.google.com/edu/classroom/answer/6020265?hl=en&co=GENIE.Platform%3DDesktop (last visited Sept. 16, 2024).

[78] *See*, *e.g.*, *A Personalized Learning Resource for All Ages*, Khan Academy, https://www.khanacademy.org/about (last visited Sept. 16, 2024) (providing "practice exercises, instructional videos, and a personalized learning dashboard" on a wide variety of subjects); *Our Company*, Tutor.com, https://www.tutor.com/about-us (last visited Sept. 16, 2024) (platform that provides online personal tutoring).

[79] *Online Academic Programs*, Univ. at Buffalo, https://www.buffalo.edu/studentaccounts/tuition-and-fees/tuition-for-online-academic-programs.html (last visited Sept. 16, 2024); *Online Degree/Program*, The Cal. State Univ., https://online.calstate.edu/Programs (last visited Sept. 16, 2024); *Power Your Career with Knowledge, Resources and Community*, USC Online, https://online.usc.edu/programs/ (last visited Sept. 16, 2024).

[80] *See*, *e.g.*, *Get Money for Food*, GetCalFresh.org, https://www.getcalfresh.org/?source=dssfood (last visited Sept. 16, 2024) (online application for California's SNAP program); *Filing an Unemployment Claim*, Cal. Emp. Dev. Dep't, https://edd.ca.gov/en/unemployment/filing_a_claim (last visited Sept. 16, 2024) (online application for California's unemployment benefits); *Special Enrollment*, Covered Cal., https://www.coveredca.com/ (last visited Sept. 16, 2024) (online application for California's Medicaid program).

a driver's license or car registration,[81] banking and paying bills,[82] and telehealth.[83]

### D. Numerous Providers Compete Intensely To Provide Broadband Service Across Much of California.

Led by private capital investment and supplemented by public funds for deployment in hard-to-serve areas, broadband deployment has been proceeding in California for over two decades and now covers the vast majority of the population. While policymakers appropriately focus on populated areas that remain without broadband access, the vast majority of Californians already have broadband service available to them. And broadband providers continue to enhance and expand their networks in the state. This widespread deployment of broadband networks means that nearly all locations in AT&T California's service territory can receive broadband service according to the latest FCC Broadband Data Collection ("BDC") data. Almost as many locations offer the choice of multiple providers. Analyzing over seven million locations in AT&T California's service territory, Dr. Israel found that more than 99 percent of those locations have three or more facilities-based broadband providers.[84] The latest data from the Commission likewise show that 99.2 percent of the population in AT&T California's service territory has access to at least three facilities-based broadband providers.[85]

Dr. Israel's analyses conservatively understate the availability of broadband service. In particular, he does not consider satellite-based broadband, which is available from HughesNet,

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[81] *See*, *e.g.*, *Driver's License and ID Application*, Cal. Dep't of Motor Vehicles, https://www.edl.dmv.ca.gov/apply/choose-language (last visited Sept. 16, 2024) (online application for California driver's license and ID); *Online Registration Renewal*, Cal. Dep't of Motor Vehicles, https://www.dmv.ca.gov/wasapp/vrir/start.do?localeName=en (last visited Sept. 16, 2024) (online renewal of vehicle registration).
[82] *See*, *e.g.*, *Log in to Online Banking*, Bank of Am., https://secure.bankofamerica.com/login/sign-in/signOnV2Screen.go (last visited Sept. 16, 2024).
[83] *See*, *e.g.*, *Telehealth Specialty Provider List*, Cal. Telehealth Res. Ctr., https://caltrc.org/featured/telehealth-specialty-provider-list/ (last visited Sept. 16, 2024).
[84] Israel Decl. ¶ 31 & tbl. 2 (describing in detail how to replicate his analysis of the FCC BDC data).
[85] *Id.* at ¶ 30 & tbl. 1.

Viasat, and Starlink across nearly all of AT&T California's service territory.[86] Competition will only accelerate with the increased deployment of broadband networks and new satellite-based services, given the unprecedented levels of public and private capital available for reaching unserved and underserved areas.[87]

With the high-speed broadband "market … on the cusp of generational change,"[88] the story told by these data will only get better and better. As carriers continue to expand their broadband networks and technology continues to improve, there will be more broadband options in more places. For instance, the impressive broadband coverage shown by the Commission's maps are based on December 2021 data, which do not reflect network expansion since then,[89] including, among other things, AT&T's own fiber and wireless network infrastructure investment,[90] T-Mobile's commitment to cover 99 percent of California's population with download speeds of at least 100 Mbps and 94 percent of California's rural population with

[86] *See id*. ¶¶ 24–33 & tbls. 1–2 (discussing methodology for determining whether competing alternatives, which do not include satellite providers, are available in AT&T's service territory); *Hughesnet® Is Available in California*, Hughesnet, https://www.hughesnet.com/availability/ca (last visited Sept. 26, 2024); *Viasat Satellite Internet*, Viasat, https://www.viasat.com/satellite-internet/ (last visited Sept. 29, 2024) ("Viasat Internet is available to most of the U.S. population, including in remote and rural areas where other internet companies offer slower service, or no service at all."); Starlink, https://www.starlink.com/map (showing availability throughout California); *see also 2022 Commc'ns Marketplace Rep.*, 37 FCC Rcd. at 15649 ¶ 200 (explaining that planned launches of next-generation satellites should improve the quality of satellite broadband services).

[87] *See 2022 Commc'ns Marketplace Rep.*, 37 FCC Rcd. at 15517–18 ¶¶ 4–6.

[88] *Id.* at 15517 ¶ 4.

[89] Israel Decl. ¶ 27 & n.22.

[90] *AT&T Fiber Now Accessible to More Than 3.1 Million Customer Locations in California*, AT&T (Feb. 21, 2024), https://about.att.com/story/2024/fiber-expansion-california.html (describing investment of nearly $8.6 billion in wireless and wireline network infrastructure from 2020–2022 and expanding fiber to nearly 170,000 customer locations in the state in 2023 alone); *AT&T To Deliver Fiber to 7,500 Locations in Riverside, San Bernardino and San Mateo Counties in Public-Private Project*, AT&T (Aug. 22, 2024), https://www.labs.att.com/story/2024/california-fiber-expansion.html ("AT&T invested nearly $14.4 billion in California wireless and wireline network infrastructure from 2019–2023. Today, more than 3.23 million residential and business locations have access to AT&T Fiber in urban and rural communities across California and we are continuing to expand in other parts of California through our own investments and in public-private projects." (emphases omitted)).

download speeds of at least 50 Mbps by the end of 2026,[91] expansion of fixed wireless services,[92] or DISH's buildout commitments to offer 5G wireless across most of AT&T California's service territory by 2025.[93] On top of these private investments, policymakers are increasingly directing public funds to high-speed broadband deployments through programs such as the California Advanced Services Fund,[94] the Federal Funding Account,[95] the Rural Digital

[91] *Joint Application of Sprint Commc'ns Co. (U5112) & T-Mobile USA, Inc., a Del. Corp., for Approval of Transfer of Control of Sprint Commc'ns Co. Pursuant to Cal. Pub. Utils. Code Section 854(a)* et al., 2020 Cal. PUC LEXIS 529, at *59 (Apr 16, 2020) (Ordering Paragraph 4).

[92] Fixed wireless now reaches more households (84.9 percent) nationwide than cable broadband. *2022 Commc'ns Marketplace Rep.*, 37 FCC Rcd. at 15523 fig. II.A.1. For instance, in 2022, the FCC reported that T-Mobile alone covers about 60 percent of the U.S. population with speeds between 25 and 100 Mbps. *Id.* at 15529–30 ¶ 27 & fig. II.A.7, 15554 fig. II.A.27. Fixed wireless has continued to grow dramatically in the United States, "absorbing all broadband subscriber growth in the market since mid-2022." Robert Wyrzykowski, *5G Fixed Wireless Access (FWA) Success in the US: A Roadmap for Broadband Success Elsewhere?*, Opensignal (June 6, 2024), https://www.opensignal.com/2024/06/06/5g-fixed-wireless-access-fwa-success-in-the-us-a-roadmap-for-broadband-success-elsewhere.

[93] Israel Decl. ¶ 41; *see* Taubenblatt Letter at 2 (finding that DISH met its commitment to offer 5G Broadband Service to at least 70% of the U.S. population); Blum Letter 2–8 (committing to expanded and accelerated deployment milestones nationwide in exchange for an extension to construction deadlines associated with certain licenses); *EchoStar Extension Approval*; DISH Network Corp., Quarterly Report (Form 10-Q) at 28, 30 (Aug. 13, 2024) (estimating capital expenditures for its 5G network deployment to be approximately $10 billion).

[94] *See*, *e.g.*, 2017 Cal. Stat. ch. 851 § 3(b)(1) (A.B. 1665) (goal of California Advanced Services Fund program "is, no later than December 31, 2022, to approve funding for infrastructure projects that will provide broadband access to no less than 98 percent of California households in each consortia region").

[95] *See Last Mile Federal Funding Account*, Cal. Pub. Utils. Comm'n, https://www.cpuc.ca.gov/industries-and-topics/internet-and-phone/broadband-implementation-for-california/last-mile-federal-funding-account (last visited Sept. 24, 2024) ("a $2 billion grant program for last-mile broadband infrastructure projects to connect unserved Californians").

Opportunity Fund,[96] American Rescue Plan funds,[97] the BEAD Program,[98] and the 5G Fund for Rural America.[99] The bottom line is that substantial portions of California have reliable high-speed broadband service available, and more areas will soon. Our shared objectives should lead the Commission and participating parties to embrace these facts while addressing the specialized circumstances of particular communities and forging a path that welcomes future developments.

## III. AT&T CALIFORNIA'S INITIAL PROPOSALS TO REFORM THE COLR OBLIGATION.

As detailed above, dramatic changes in technology, competition, and consumer preferences since 1996 have undermined the foundations of the COLR rules. Data show that the vast majority of Californians enjoy the availability of broadband services from at least a few facilities-based providers. These developments call for a thorough reexamination of the legacy COLR obligation. Based on these new realities, AT&T California offers its proposals for (i) areas that are well-served with broadband today; (ii) areas where there are no population, no current COLR basic telephone service customers, and no serviceable locations according to the

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[96] *See Rural Digit. Opportunity Fund*, Report and Order, 35 FCC Rcd. 686, 687 ¶ 2 (2020) ("The Rural Digital Opportunity Fund represents the [FCC's] single biggest step to close the digital divide by providing up to $20.4 billion to connect millions more rural homes and small businesses to high-speed broadband networks.").

[97] *State Fiscal Recovery Fund*, State of Cal. Dep't of Fin., https://dof.ca.gov/budget/state-fiscal-recovery-fund/ (July 30, 2024) (noting that California has received "$27 billion in state fiscal recovery funds" that can be used for, among other items, broadband infrastructure); *Local Fiscal Recovery Fund Allocations*, State of Cal. Dep't of Fin., https://dof.ca.gov/budget/local-fiscal-recovery-fund-allocations/ (June 23, 2023) (explaining that the local fiscal recovery fund can be used to invest in broadband infrastructure); *Capital Projects Fund*, State of Cal. Dep't of Fin., https://dof.ca.gov/budget/capital-projects-fund/ (noting that California received $540.2 million from the Capital Projects Fund that would be used on the CPUC's Last Mile Broadband Expansion program).

[98] *See Broadband Equity, Access, and Deployment Program*, BroadbandUSA, Nat'l Telecomms. & Info. Admin., https://broadbandusa.ntia.doc.gov/broadband-equity-access-and-deployment-bead-program#:~:text=The%20Broadband%20Equity%2C%20Access%2C%20and,and%20the%20Commonwealth%20of%20the (last visited Sept. 15, 2024) (providing $42.45 billion to expand high-speed internet access).

[99] *Establishing a 5G Fund for Rural America*, GN Docket No. 20-32, Second Report and Order, Order on Reconsideration, and Second Further Notice of Proposed Rulemaking, 2024 FCC LEXIS 2416 (rel. Aug. 29, 2024).

National Broadband Map; and (iii) populated areas without broadband service today and, thus, no provider of voice service other than the existing COLR.

### A. A COLR Is Not Needed in Areas That Are Well-Served with Broadband, and the Commission Should Instead Focus on Local Communities That Continue To Rely on Legacy Safety-Net Voice Services.

The COLR requirement was a means to provide all consumers with voice service. For areas that are well-served with broadband, voice service is ubiquitously available, and no COLR providing basic service is needed, at least as a general rule. In well-served areas, the marginal cost of serving additional customers is relatively low compared to the high fixed costs of building and maintaining telecommunications networks, so additional customers tend to be profitable.[100] As a result, providers have a strong incentive to increase their customer bases to spread these fixed costs more widely.[101] These competitive dynamics drive providers to market their services aggressively to attract new, and maintain existing, subscribers.[102]

Moreover, the definition of "basic service," which was designed for narrowband voice services—POTS above all, makes little sense for areas that are well-served with broadband. Now a dozen years old, that definition has become outdated due to changes to technology and consumer preferences. In one example, it requires "[d]irectory services," such as "access to directory assistance within the customer's local community; options for listed or unlisted directory listings; and options for free white pages telephone directory."[103] Mobile wireless and

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[100] *See* Israel Decl. ¶ 42; Doug Brake & Robert D. Atkinson, *A Policymaker's Guide to Broadband Competition*, Info. Tech. & Innovation Found. (Sept. 3, 2019), https://itif.org/publications/2019/09/03/policymakers-guide-broadband-competition/ ("*Policymaker's Guide*") (explaining circumstances in which providers can serve a large number of customers at low costs).

[101] *See* Israel Decl. ¶ 42; *Policymaker's Guide.*

[102] *See* Israel Decl. ¶ 42; *Policymaker's Guide* ("Firms in high-fixed-cost industries such as broadband provision will fight vigorously for customers, even in markets with few competitors, because they cannot easily reduce costs when revenue is reduced.").

[103] *2012 CPUC Decision*, 2012 Cal. PUC LEXIS 597, at *28.

VoIP providers do not offer such directory services, and customers no longer need them when an internet connection puts all this information just a few clicks away.

Leaving behind the notion of basic service in areas that are well-served with broadband would be consistent with the FCC's approach to the technology transition from POTS to broadband. In adopting its "adequate replacement test" for discontinuance of legacy TDM-based voice services, the FCC made clear that it does not want "to stifle the new and innovative ways that a replacement service could benefit customers" and thus "recogniz[ed] that a shift from a TDM network to a new technology will never be a purely apples-to-apples comparison."[104] The FCC accordingly took a "straightforward, streamlined approach" that enables the FCC "to focus on the issues most important to consumers":[105] "(i) substantially similar levels of network infrastructure and service quality as the applicant service; (ii) compliance with existing federal and/or industry standards required to ensure that critical applications such as 911, network security, and applications for individuals with disabilities remain available; and (iii) interoperability and compatibility with an enumerated list of applications and functionalities determined to be key to consumers and competitors."[106] The Commission should take a similar approach here and recognize that voice services provided over fixed and mobile broadband offer these features. For instance, under the FCC's rules, a consumer with any fixed or mobile broadband service has access to voice services that interconnect with the public switched telephone network and support 911 calls.[107]

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[104] *Tech. Transitions*, Declaratory Ruling, Second Report and Order, and Order on Reconsideration, 31 FCC Rcd. 8283, 8307 ¶ 70 (2016).
[105] *Id.* at 8305–06 ¶¶ 66, 68.
[106] *Id.* at 8305 ¶ 65; *see* 47 C.F.R. § 63.602. These "enumerated" applications and functionalities are fax machines, home security alarms, medical monitoring devices, analog-only caption telephone sets, and point-of-sale terminals. *Tech. Transitions*, 31 FCC Rcd. at 8342 ¶ 159.
[107] 47 C.F.R. § 9.10.

Consumers overwhelmingly choose voice services over fixed or mobile broadband networks when they can because these services are functionally equivalent to POTS on the dimensions that matter to today's customers. Almost all the population in AT&T California's service territory lives in areas with options for voice service. The National Broadband Map, based on data from December 2023, shows there are at least three facilities-based fixed or mobile broadband providers in more than 99 percent of the locations in AT&T California's service territory.[108] Based on data from two years earlier (December 2021), the Commission's most recently released broadband maps also depict widely available coverage of AT&T California's service territory: at least three facilities-based fixed or mobile broadband providers serve census blocks covering over 99 percent of the population.[109] In such well-served areas, the COLR obligation generally is unnecessary and should be removed now.

However, despite being well-served by broadband, there may be a small number of local communities that—because of their distinctive factors—continue to have a compelling need for a safety-net voice service for emergencies. Through the workshop process proposed below, this proceeding should explore these needs and identify the best solution for any such community. Apart from these potential exceptions, the Commission should lift the COLR obligation in well-served areas.

As discussed later, in areas that are not yet well-served with broadband service, AT&T California recognizes the importance of a COLR providing basic service. With broadband service reaching more and more Californians, though, that construct should apply to fewer and fewer places and soon should be retired everywhere.[110]

[108] Israel Decl. ¶¶ 31–32 & tbl. 2.
[109] *Id.* ¶ 30 & tbl. 1.
[110] Although the 2012 definition of "basic service" is outdated, AT&T California does not believe the Commission and parties should expend resources to revise the definition for the limited areas where

### B. A COLR Is No Longer Necessary in Areas Without People.

At the other end of the spectrum from well-served areas are the undeveloped places without any people. Where there are no people, there is no demand for communications services. In those areas, there is no need for a COLR. If an area becomes populated but does not attract a broadband provider, appropriately funded government programs can ensure deployment of broadband service.

The U.S. Census Bureau reports some census blocks as unpopulated. To ensure that a census block actually is uninhabited,[111] it should be counted as such only if (a) the census reports that it has no population, (b) the applicable COLR does not serve any customer address with basic telephone service in that census block, *and* (c) the National Broadband Map does not report any serviceable locations. As an illustrative matter, approximately 17 percent of the census blocks in AT&T California's service territory have no population according to the U.S. Census Bureau, no current basic telephone service (*i.e.*, POTS) subscribers, *and* no FCC-reported serviceable locations.[112] Removing the COLR obligation in such areas would harm no one.

If people subsequently move into unpopulated areas, either a provider will deploy broadband service to the new development on its own, or the government should provide funds to support the deployment. New housing developments typically have the critical mass of customers to attract a provider because the provider can earn an adequate return on its

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AT&T California would remain the COLR if its proposals are adopted—especially as new broadband deployments would progressively reduce the scope of those areas.

[111] For instance, a census block might contain only vacation homes. Because the Census Bureau requests participants to associate their households with their primary residences, such a census block would have no residents according to the census. As another example, some census blocks contain only commercial property and, thus, have no residents.

[112] Israel Decl. ¶ 12.

investment for extending its network.[113] In those cases, broadband providers compete—often aggressively—for housing developers to give them the opportunity to serve such greenfield deployments.[114] Government programs to support broadband deployment should fill the gap where a development fails to attract an interested broadband provider. The answer for these developments lies in those programs rather than imposing an obligation on an unwilling carrier, whether the COLR or otherwise.

### C. The Commission Should Develop a Modern Solution for Populated Areas Not Well-Served with Broadband.

While only a tiny fraction of the population lives in areas of the state without good broadband service, the significant variations across California may make it challenging to find a one-size-fits-all rule. Some areas qualify as high-cost—meaning that they qualify under historic rules related to the cost to deploy and maintain networks—and, thus, are eligible for CHCF-B Fund support.[115] Tribal lands, at least in some cases, present different challenges. And the state's varied geography and topography—mountain areas, desert regions, coastal communities, and

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[113] *See* Doug Brake, Info. Tech. & Innovation Found., *A Policymaker's Guide to Rural Broadband Infrastructure* 5 (2017), https://www2.itif.org/2017-rural-broadband-infrastructure.pdf ("Economies of scale … measures how the costs of providing a network go down with additional users. Broadband networks have tremendous up-front costs that cannot be transferred to other uses—the actual deployment of infrastructure. But once the network is built and the wires strung, the marginal costs of adding new customers are relatively low.").

[114] *See Customized Telecom Solutions for New Communities*, Broadband Agreement Specialists, Inc., https://www.broadbandagr.com/developers.html (last visited Sept. 24, 2024) (explaining that "your new construction property is important to the cable and telco providers, and they … want to earn your business"). Broadband providers, including AT&T, have dedicated channels and processes for bulk internet service designed to serve new and existing multi-family or mixed-use developments, reflecting the desirability of these developments to broadband providers. *See Bring Superfast Internet to Your Properties with AT&T Fiber*, AT&T, https://www.att.com/att/multifamily-property/ (last visited Sept. 25, 2024); *Discover the Future of Advanced Connectivity*, Xfinity, https://www.xfinity.com/multifamily/products (last visited Sept. 25, 2024); *Fiber Internet for Multifamily Communities*, Quantum Fiber, https://www.quantumfiber.com/connected-communities.html (last visited Sept. 25, 2024); *Verizon Enhanced Communities*, Verizon, https://www.verizon.com/home/communities/ (last visited Sept. 25, 2024).

[115] *See* Cal. Pub. Util. Code § 276.5.

offshore islands—may demand varied solutions. Policymakers should concentrate on providing those particularized solutions while avoiding the broad brushstrokes of the COLR obligation, which is unnecessary for the vast majority of Californians.

To the extent possible, the solutions focused on areas without broadband should create incentives to attract willing service providers. Congress, in establishing the Universal Service Fund, and the Commission, in establishing the CHCF-B Fund, recognized the need to support carriers charged with universal service through explicit funding, instead of the traditional implicit subsidies. Congress, in particular, emphasized the need for adequate funding to induce voluntary delivery of service instead of imposing the obligation on carriers. In working on what became the Telecommunications Act of 1996, the Senate committee explained:

> In … the competitive environment of the future … , the public interest may be better served by having carriers contribute to a fund or other support mechanisms which would be used to provide support payments to one or more telecommunications carriers that *agree* to undertake the service obligation that might otherwise be imposed on all providers.[116]

Similarly, the FCC has instructed that universal service should be fulfilled by willing participants.[117]

However, in its current form, the CHCF-B Fund is inadequate to attract these willing participants. CHCF-B Fund support is only available to the COLR in high-cost areas, and only for residential lines.[118] Moreover, the fund has declined in size substantially over the years, from

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[116] S. Rep. No. 104-23, at 28 (emphasis added).

[117] *Protecting Against Nat'l Sec. Threats to the Commc'ns Supply Chain Through FCC Programs*, Second Report and Order, 35 FCC Rcd. 14284, 14305 ¶ 43 (2020) ("Designation as an ETC, and the opportunity therefore to participate in USF programs, or acceptance of USF funds through those programs, is likewise voluntary, and providers that are currently designated as ETCs or that accept universal service funding may decline to participate in USF programs."); *see also id.*, Third Report and Order, 36 FCC Rcd. 11958, 14305 ¶ 43 (2021).

[118] Cal. Pub. Util. Code § 276.5 (establishing the CHCF-B Fund to support "telephone corporations serving areas where the cost of providing services exceeds rates charged by providers"); *California High Cost Fund B Fact Sheet*, Cal. Pub. Utils. Comm'n (2024), https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/communications-division/documents/high-cost-support-and-surcharges/chcf-b/chcf-b-

$352 million per year in 1996 ($668 million in today's dollars) to $22 million in the 2020–21 budget.[119] In short, it offers too little support for the areas that require it. Recent experience proves this point: When the Commission sought other carriers to volunteer to replace AT&T California as the COLR,[120] not a single carrier came forward—not even with the prospect of CHCF-B support determined by an auction.[121] Guided by that outcome, AT&T California recommends that the Commission consider reforming the CHCF-B Fund requirements to attract service providers through an auction or otherwise. In the end, though, legislative action may be needed to lift the statutory restriction of B Fund support to high-cost areas.[122]

### D. The Commission Should Create a Forward-Looking Process To Account for New Broadband Deployments in Areas That Currently Are Not Well-Served.

Unless a voluntary replacement COLR can be attracted through incentives, AT&T California remains committed, as part of its proposals, to serving as the COLR for its customers that lack a voice option because they live in an area that is not well-served by broadband. However, the COLR obligation should end as broadband availability expands to such areas, and this rulemaking should produce an efficient process for this transition. Broadband providers continue to bring their networks to additional parts of the state through massive private and public investments. As the state works toward its broadband goals, unserved customers will gain access to broadband and new sources of voice service.

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fact-sheet.pdf (explaining that where the cost to providers of providing service is $36 or more per telephone line, the CHCF-B fund gives providers an average of $12.79 per month per line).

[119] *OIR*, 2024 Cal. PUC LEXIS 359, at *6 n.13.

[120] *Application of Pac. Bell Tel. Co. d/b/a/ AT&T Cal. (U1001C) for Targeted Relief from Its Carrier of Last Resort Obligation & Certain Associated Tariff Obligations*, A.23-03-003, Administrative Law Judge's Ruling on Noticing Potential Carriers of Last Resort (Feb. 28, 2024).

[121] *Decision Dismissing with Prejudice the Application of AT&T Cal. To Withdraw as a Carrier of Last Resort*, D.24-06-024, 2024 Cal. PUC LEXIS 331, at *15 (June 25, 2024) ("[N]o carrier eligible to replace AT&T as a COLR volunteered to do so.").

[122] *See* Cal. Pub. Util. Code § 276.5.

Commission policy should recognize this ongoing process and develop forward-looking rules that account for new coverage as it is introduced. Once an area becomes well-served, AT&T California proposes that this proceeding should adopt rules to remove the COLR obligation there.

### E. The Commission Should Convene Workshops Structured To Resolve Important Open Issues.

Resolving the issues addressed above calls for a collaborative investigation that will be difficult to achieve through formal pleadings and evidentiary hearings. Accordingly, AT&T California respectfully suggests that the Commission convene workshops structured to try to forge a consensus on certain topics. Possible issues for resolution in workshops include:

- What qualifies an area as well-served with broadband?
- What data source(s) should be used to determine if an area is well-served?
- How should the Commission identify local communities that continue to rely on legacy safety-net voice services despite being well-served with broadband? What is the appropriate competitively neutral solution for each specific community?
- What should be the forward-looking process for identifying areas as newly well-served?
- How should the Commission accommodate developments in broadband technology as they are deployed?
- Recognizing the importance of an appropriate customer transition process for the end of the COLR obligation in a populated area—one that accounts for the particularized needs of vulnerable populations—what should that process be?[123] Should this process be different in areas that already are well-served with broadband than in areas that subsequently become well-served? What is needed to ensure customers have all the relevant information without causing confusion?

## IV. CONCLUSION

For the reasons shown above, the Commission should adopt AT&T California's initial proposals (i) to end the COLR obligation for areas that are well-served with broadband; (ii) to

[123] No transition process is necessary in unpopulated areas as defined with the three-part test above.

end the COLR obligation for areas where (a) the census reports that there is no population, (b) the applicable COLR does not serve any customer address with basic telephone service in that census block, *and* (c) the National Broadband Map does not report any serviceable locations; (iii) to consider reforms to the CHCF-B Fund; (iv) to develop a straightforward mechanism to remove the COLR obligation in an area that becomes well-served with broadband, absent a compelling need; and (v) to convene workshops structured to refine these proposals collaboratively.

Dated: September 30, 2024.

Respectfully submitted,

AT&T California

*/s/ Meredith B. Osborn*

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# ATTACHMENT A

**ATTACHMENT A**
**DISCUSSIONS OF SCOPING ISSUES**

| Issue | Section of These Comments |
|---|---|
| a. Is it still necessary for the Commission to maintain its COLR rules? Here, the Commission adopts a rebuttable presumption that the COLR construct remains necessary, at least for certain individuals or communities in California. | II.B–D, III.A–B, III.D |
| b. Should the Commission revise the definition of a COLR, and if yes, how should the Commission revise that definition? What should be the responsibilities of a COLR? | N/A |
| c. Should the Commission revise how it defines a COLR's service territory? | II.B–D, III.A–B, III.D–E |
| d. Are there regions or territories in California that may no longer require a COLR? Are there regions that require COLR service? If yes, how should the Commission distinguish between the two? What criteria should be met for a region or territory to no longer require COLR designation? | II.B–D, III.A–B, III.D–E |
| e. Can the Commission require Voice over Internet Protocol (VoIP) providers to be COLRs? If yes, should the Commission designate VoIP providers as COLRs? | N/A |
| f. Can COLR service be provisioned using wireless voice service? Can the Commission direct wireless voice providers to serve as COLRs? If yes to both, should the Commission designate wireless voice providers as COLRs? | N/A |
| g. If the Commission does not have the authority to require a wireless voice provider to offer COLR service, is a wireless voice provider eligible to volunteer to be a COLR? If yes, should the Commission grant such an application? Should the requirements of a potential wireless COLR be different than a COLR offering Plain Old Telephone Service (POTS) or VoIP service? | N/A |
| h. Should the Commission revise the requirements of basic service? If yes, which requirements or elements should be revised, and what should be those revisions? | III.A |
| i. Should the Commission revise the subsidy amount offered for participation in the California High Cost Fund-B? What is an appropriate subsidy amount and how should it be calculated? | III.C |

| Issue | Section of These Comments |
|---|---|
| j. Should the Commission revise its rules for how and when a COLR is allowed to withdraw from its designated service territory? If so, how should the Commission revise its rules? Should the Commission require that the service of a potential replacement COLR be functionally similar to that of the current COLR? If yes, what similar functionality requirements should the Commission adopt? | III.A–B, III.D–E |
| k. When should a COLR seeking to withdraw be required to notify residents in the COLR territory of its request to withdraw? What should be included in the contents of that notification? What method(s) should be used for notification? | III.E |
| l. If a COLR applies to withdraw, and a new COLR is designated, is there a need for a customer transition period? If yes, how long should that transition period last? What customer service protections, if any, should the Commission impose as part of a customer transition period? What other elements or processes, other than customer protections, should be provided in a customer transition period? How long should a customer transition period last? | III.E |

# ATTACHMENT B

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

| | |
|---|---|
| Order Instituting Rulemaking Proceeding to Consider Changes to the Commission's Carrier of Last Resort Rules | Rulemaking 24-06-012<br><br>(Filed June 20, 2024) |

# DECLARATION OF MARK A. ISRAEL

# ON BEHALF OF AT&T

## CONTENTS

# I. QUALIFICATIONS, ASSIGNMENT, AND SUMMARY OF CONCLUSIONS

## A. QUALIFICATIONS

1. I am a Senior Managing Director at Compass Lexecon, an economic consulting firm where I have worked since 2006. From 2000 to 2006, I served as a full-time member of the faculty at Kellogg School of Management at Northwestern University in Illinois.

2. I am an economist by training and by profession. I have Bachelor's, Master's and Doctoral degrees in economics. I received my B.A. from Illinois Wesleyan University in 1991, graduating summa cum laude. I received my M.S. from the University of Wisconsin-Madison in 1992. I received my Ph.D. from Stanford University in 2001.

3. I specialize in the economics of industrial organization—which is the study of competition in imperfectly competitive markets, including the study of antitrust and regulatory issues—as well as applied econometrics. At Kellogg and Stanford, I taught graduate-level courses covering topics including business strategy, industrial organization economics, and econometrics. My research on these topics has been published in leading peer-reviewed economics journals, including the American Economic Review, the Rand Journal of Economics, the Review of Industrial Organization, Information Economics and Policy, and the Journal of Competition Law and Economics.

4. My work at Compass Lexecon has focused on the application of economic theory and econometric methods to competitive analysis of the impact of mergers, antitrust and pricing issues including a wide variety of single-firm and multi-firm conduct, class certification, and damages estimation. I have analyzed these competition issues on behalf of a wide range of clients, including private companies and government entities.

5. I have particular interest, experience, and expertise in applying economic analysis to issues involving competition and regulation in telecommunications. I have been involved in the telecommunications industry throughout my career, have been among the lead economists on nearly all of the recent wireless telecommunications transactions of significance in North America, including the recent Sprint-T-Mobile and Verizon-Tracfone transactions in the United States and the recent Rogers-Shaw transaction in Canada. As part of this work, I have submitted

testimony related to the telecommunications industry before courts, tribunals, and regulatory bodies on many occasions.

6. I have testified in federal courts and multiple state courts in the United States, and in many regulatory and arbitration proceedings in the United States and around the world, including Canada. I have testified repeatedly before the U.S. Federal Communications Commission ("FCC"), which regulates international and interstate communications in the United States by, among other things, radio. In addition, I have testified before the Public Utilities Commission of the State of California ("CPUC") during my work on Verizon-TracFone, Sprint-T-Mobile, Comcast-Time Warner Cable transactions, and AT&T California's application to relinquish its Eligible Telecommunications Carrier designation. I have also presented my findings to the Department of Justice and the Federal Trade Commission on dozens of occasions. In addition, I have submitted expert reports, declarations, and affidavits to government agencies and federal and state/provincial courts on numerous occasions over the years.

7. My *curriculum vitae*, attached as Attachment A to this declaration, includes a list of my publications and a list of my engagements in which I testified at trial or by deposition.

### B. BACKGROUND AND ASSIGNMENT

8. AT&T's subsidiary Pacific Bell Telephone Company, d/b/a AT&T California, is an Incumbent Local Exchange Carrier ("ILEC") providing Plain Old Telephone Service ("POTS") in its service territory in the state of California. In this declaration, I will refer to Pacific Bell as AT&T for simplicity, but all my analysis concerns AT&T's subsidiary Pacific Bell and its service territory in California.

9. As an ILEC, AT&T is subject to regulations, one of which is a Carrier of Last Resort ("COLR") designation, which requires it to provide basic voice service upon request to customers within its designated service territory.[1] I understand that the CPUC has begun a

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1. See, *e.g.*, COLR definition in CPUC General Order 133-D (available at https://www.cpuc.ca.gov/-/media/cpuc-website/files/uploadedfiles/cpuc_public_website/content/proceedings/proceedings_rules/go133d.pdf). AT&T provides POTS over its Time-Division Multiplexing ("TDM") network to satisfy its COLR obligation.

rulemaking proceeding to examine the COLR regime in California.[2] I have been asked by counsel for AT&T to use my expertise in economics to evaluate the costs and benefits of the COLR obligation to consumers and other market participants. The OIR contains a list of questions the CPUC is particularly interested in. I note in my analysis which questions my opinions are relevant to.

10. The materials I have relied upon are listed in Attachment B. I have been assisted in my work by staff at Compass Lexecon working under my direction.

### C. SUMMARY OF CONCLUSIONS

11. Applying the teachings of economics to the relevant facts and data yields the following principal conclusion: Universal access to voice services is an important policy goal, but, even as that goal is pursued, it is important to recognize that regulation comes with both benefits and costs. And policymakers should be prepared to adjust regulations as circumstances change. In particular, there are at least two types of geographic areas where the COLR obligation does not make economic sense. The first of these types is areas that are well-served by broadband today.[3] Evidence from the marketplace clearly indicates consumers overwhelmingly prefer available fixed and mobile alternatives to legacy POTS, and where there is broadband availability, competition also ensures that voice services will be available. The second of these types is areas that are uninhabited, lack POTS customers, and lack serviceable locations and thus pose no concern regarding universal access.

12. My principal conclusion is supported by the following more detailed findings. For each finding, I note the section that discusses the finding, and which questions noted in the OIR the finding is relevant to.

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2. CPUC, Order Instituting Rulemaking Proceeding to Consider Changes to the Commission's Carrier of Last Resort Rules, Rulemaking 24-06-012, June 28, 2024 ("OIR").

3. Throughout this declaration I use the term *broadband* to describe both fixed broadband and mobile broadband consistent with CPUC and FCC nomenclature. Fixed broadband includes both landline services and fixed wireless services. Mobile broadband includes mobile wireless services.

- The economics of telecommunications today are fundamentally different from those that held when the COLR regime was introduced. POTS—the technology around which AT&T's COLR service is currently based—has been superseded by alternative superior technologies. Nearly three quarters of adults in California are "wireless only," *i.e.*, they do not have *any* landline service let alone a legacy POTS service. And the number of landlines relying on newer alternative technologies such as Voice Over Internet Protocol ("VOIP") greatly exceeds the number of POTS landlines in California. (See Section II.A.1. This discussion is relevant to OIR question b.)
- These alternative technologies are widely available. More than 99% of the population within AT&T's service territory in California has access to at least three facilities-based providers using these alternative technologies. (See Section II.A.2. This discussion is relevant to OIR questions a, c, and d.)
- These alternatives are affordable. For example, there are many mobile and VOIP plans at price points similar to or lower than the price for POTS offered by AT&T under its COLR obligation. (See Section II.A.3. This discussion is relevant to OIR questions a, b, and d.)
- When areas are well-served by alternatives, the economic justification for the COLR obligation—ensuring that consumers have access to voice services in the face of a monopoly provider—no longer exists. Competition has resulted in service availability, the ideal economic outcome, and an outcome in which regulation is no longer warranted and is likely harmful. (See Section II.A.4. This discussion is relevant to OIR questions a and d.)
- There are other areas within AT&T's service territory that lack current or potential customers. For example, there are many census blocks within AT&T's service territory that have zero population according to the census. Similarly, there are many census blocks that lack any current AT&T POTS subscribers. Finally, many areas lack even any locations for which customers might purchase service (*i.e.*, no FCC serviceable locations per the FCC's Fabric data). About 17

percent of census blocks within AT&T's service territory have zero population according to the census *and* have no current AT&T POTS subscribers *and* lack any FCC serviceable locations. In such areas, there is clearly no need for a COLR obligation. (See Section II.A.5. This discussion is relevant to OIR questions a and d.)

- Regulations have significant costs (along with their benefits). The economic costs of a COLR obligation are significant—in particular, the distortion of competitive outcomes in areas where there is competition—and those costs should be considered when evaluating whether the obligation should be continued in all areas. As a matter of economics, a policy that forces just one competitor among many to devote scarce resources to a declining legacy technology distorts competition, inefficiently allocates scarce resources, and harms consumers. Unlike its competitors not subject to the COLR obligation, AT&T must maintain an entire legacy network and set of services throughout its service territory to serve a small and rapidly declining fraction of customers. And it must do so while also maintaining and investing in the newer technologies that consumers demand and that will enable it to compete going forward. Regulation bolstering an otherwise declining technology harms consumers in the long run, including current POTS customers, because over time it results in inefficiently allocated resources and slowed technological advancement. (See Section II.B. This discussion is relevant to OIR questions a, b and d.)

- The points above lead to the following conclusion: At least in areas that are well-served by existing competition and in areas with no current or potential customers, the COLR obligation is not economically justified, and AT&T and other ILECs should be relieved of it. Precisely how to define "well-served" or "unpopulated" areas can be determined by the CPUC in this proceeding. In addition, I understand that AT&T is proposing workshops to identify specific communities that due to unique factors may have a continued need for a COLR service. To assist in the effort to determine where the COLR obligation should be ended, I present evidence that most people within AT&T's California service

territory have multiple facilities-based broadband options (and hence many voice options). And I also show that there are large swathes of AT&T's service territory that lack population, AT&T POTS customers, and serviceable locations.

## II. THE ECONOMICS OF TELECOMMUNICATIONS HAVE CHANGED GREATLY SINCE THE CREATION OF COLR

13. The telecommunications industry has greatly changed since the creation of COLR. Such changes were anticipated at the time,[4] and it is economically appropriate for the CPUC to revisit the COLR regime in light of those changes, as it is doing in this proceeding.

### A. THE MARKET HAS SPOKEN: POTS HAS BEEN SUPERSEDED BY ALTERNATIVE SUPERIOR TECHNOLOGIES

14. The days when telephone service was available only over a single company's twisted copper wiring are long gone. Today consumers can use—and overwhelmingly do use—alternatives including Internet Protocol ("IP")-based fixed and mobile services. These other technologies have many advantages relative to traditional POTS and are available at affordable prices.

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4. See, *e.g.*, Rulemaking on the Commission's Own Motion into Universal Service and Compliance with the Mandates of Assembly Bill 3643, 1996 Cal. PUC LEXIS 1046; 68 CPUC 2d 524, October 25, 1996, at *396, Findings of Fact, Finding 16 ("16. As the marketplace for local telephone exchange service moves from a monopoly provider to multiple providers, the universal service program needs to be readjusted to meet the challenges of increasing competition."). See also Report of the Committee on Commerce, Science, and Transportation, on S. 652, March 30, 1995, p. 28 ("In a monopoly environment this requirement took the form of an obligation to provide service throughout an entire area; in the competitive environment of the future it may not be necessary or desirable to meet the requirement to provide universal service by imposing on all telecommunications providers the obligation to provide service throughout an entire area. Instead, the public interest may be better served by having carriers contribute to a fund or other support mechanisms which would be used to provide support payments to one or more telecommunications carriers that agree to undertake the service obligation that might otherwise be imposed on all providers.").

### 1. Alternative superior technologies are growing while POTS is declining

15. The CPUC asks about the definition of a COLR (*e.g.*, OIR question b). When evaluating such questions, it is important to look at how consumer choices among different technologies have changed over time, as those choices are the best available information on what options best meet consumers' needs.

16. POTS is declining because the technology has been surpassed and thus the market has moved on. The economic inefficiencies and competitive distortions from the COLR obligation (discussed in Section II.B) arise due to the investments required to maintain a legacy network, which has been surpassed technologically, and which fewer and fewer customers actually use. The FCC, for example, has noted in the context of broadband provision, that "providers' freedom to make network investments is optimized when they need not divert capital to outdated network equipment and services while seeking discontinuance approval." The FCC has also stated that carriers should be able to "invest and innovate without being 'locked in' to maintaining those investments [in outdated network equipment and services] as circumstances and technology evolve."[5]

17. Consumers have overwhelmingly moved away from POTS and to newer and superior technologies, as have all competing voice providers. A requirement to universally maintain POTS service under these conditions inefficiently prevents investment dollars from following consumer demand, as would happen in an efficient marketplace. Figure 1 below demonstrates these trends based on FCC Voice Telephone Services Reports data.[6] The figure shows that the number of switched access lines (which the FCC defines as "the basis of plain old telephone service (POTS)"), denoted by the blue line, in California has declined by more than *83 percent*, from more than 18.7 million in 2008 to less than 3.2 million in 2022. In contrast, VOIP lines in service, denoted by the orange line, increased by about *260 percent*, from about 2.2

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5. Federal Communications Commission, FCC 24-52, In the Matter of Safeguarding and Securing the Open Internet, Restoring Internet Freedom, Declaratory Ruling, Order, Report and Order, and Order on Reconsideration, adopted April 25, 2024, ¶ 345.

6. FCC Voice Telephone Services: Status as of June 30, 2022 (available at https://www.fcc.gov/voice-telephone-services-report).

million in 2008 to more than 8 million in 2022. The number of mobile connections, denoted by the red line, was already greater than the number of switched access lines and VOIP lines combined as of 2008 and has only grown further since then, increasing by another 43 percent from about 32 million to about 46 million.

18. The POTS penetration percentage (meaning POTS lines per household) has declined even faster. In 2005, residential POTS penetration in the United States was 96 percent (108.3 million POTS lines divided by 113.3 million households).[7] In 2022, POTS penetration fell to 8.5 percent (11.2 million POTS lines divided by 131.2 million households).[8] This is an enormous decline of 87.5 percentage points over 17 years. AT&T estimates indicate that the penetration within its service territory in California (*i.e.*, number of residential POTS lines relative to households residing within its service territory) was even lower in December 2023 at 4.8 percent.[9]

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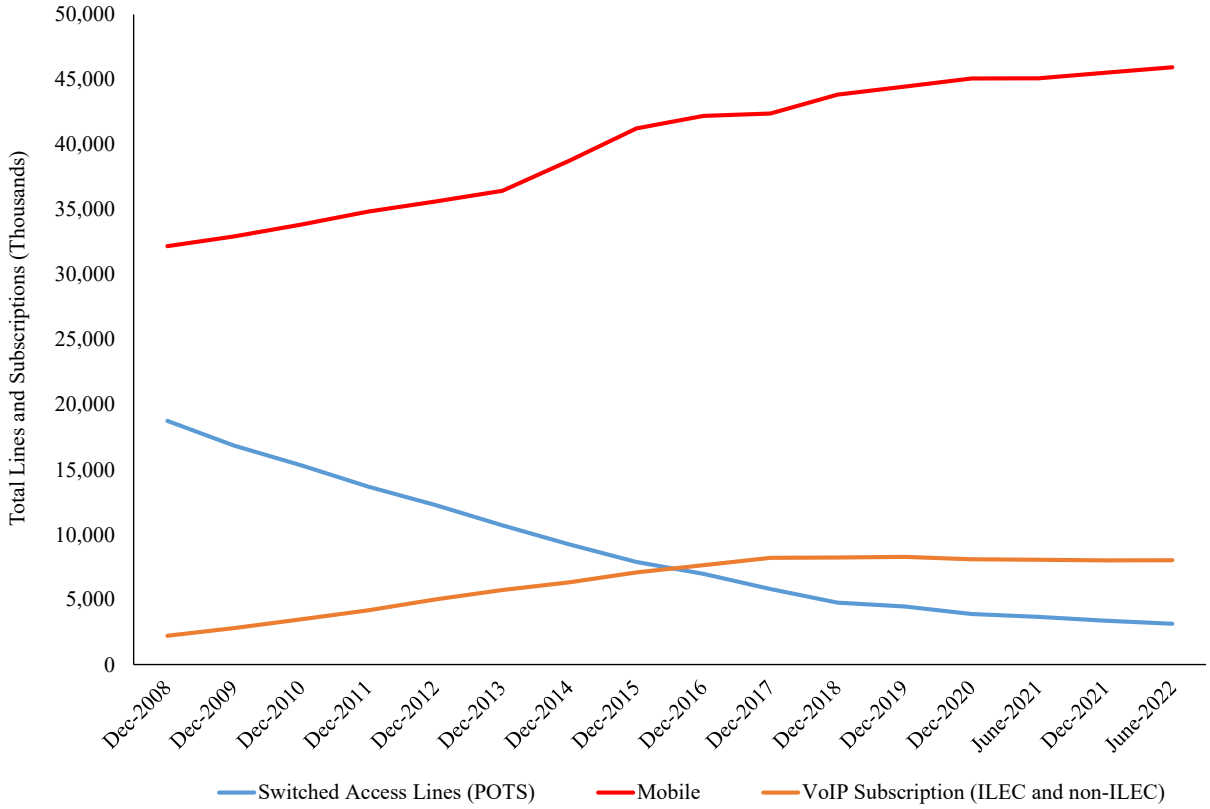
7. POTS lines based on data from FCC Local Telephone Competition: Status as of December 31, 2005 (available at https://docs.fcc.gov/public/attachments/DOC-266595A1.pdf). Residential lines are obtained by multiplying ILEC and CLEC total lines by their respective percentage of residential lines. Household estimates are from Census Historical Households Tables, November 2023 (available at https://www.census.gov/data/tables/time-series/demo/families/households.html).

8. POTS lines based on data from FCC Voice Telephone Services: Status as of June 30, 2022 (available at https://docs.fcc.gov/public/attachments/DOC-396138A1.pdf). Household estimates are from Census Historical Households Tables, November 2023 (available at https://www.census.gov/data/tables/time-series/demo/families/households.html).

9. AT&T analysis.

**Figure 1: Switched Access (POTS), VoIP, and Mobile Lines in California (December 2008 – June 2022)**




Source: "Voice Telephone Services Report – Nationwide and State-level Data," Federal Communications Commission, Updated: Friday, August 18, 2023, distributed by the Federal Communications Commission, https://www.fcc.gov/voice-telephone-services-report (biannual, for all telephony lines & subscribers).

19. Strikingly, the majority of households do not have landline voice service *of any type*. For example, the National Health Interview Survey Early Release Program found that as of 2022—two years ago—73 percent of California adults were already living in "wireless-only" households, *i.e.*, households without a landline.[10] A further 15.4 percent of California adults were "wireless mostly" users, *i.e.*, users who have both wireless and landline connections but who answer all or almost all calls on wireless phones.[11] Nationally, the Centers for Disease Control and Prevention ("CDC") estimates that 76 percent of adults lived in a wireless-only

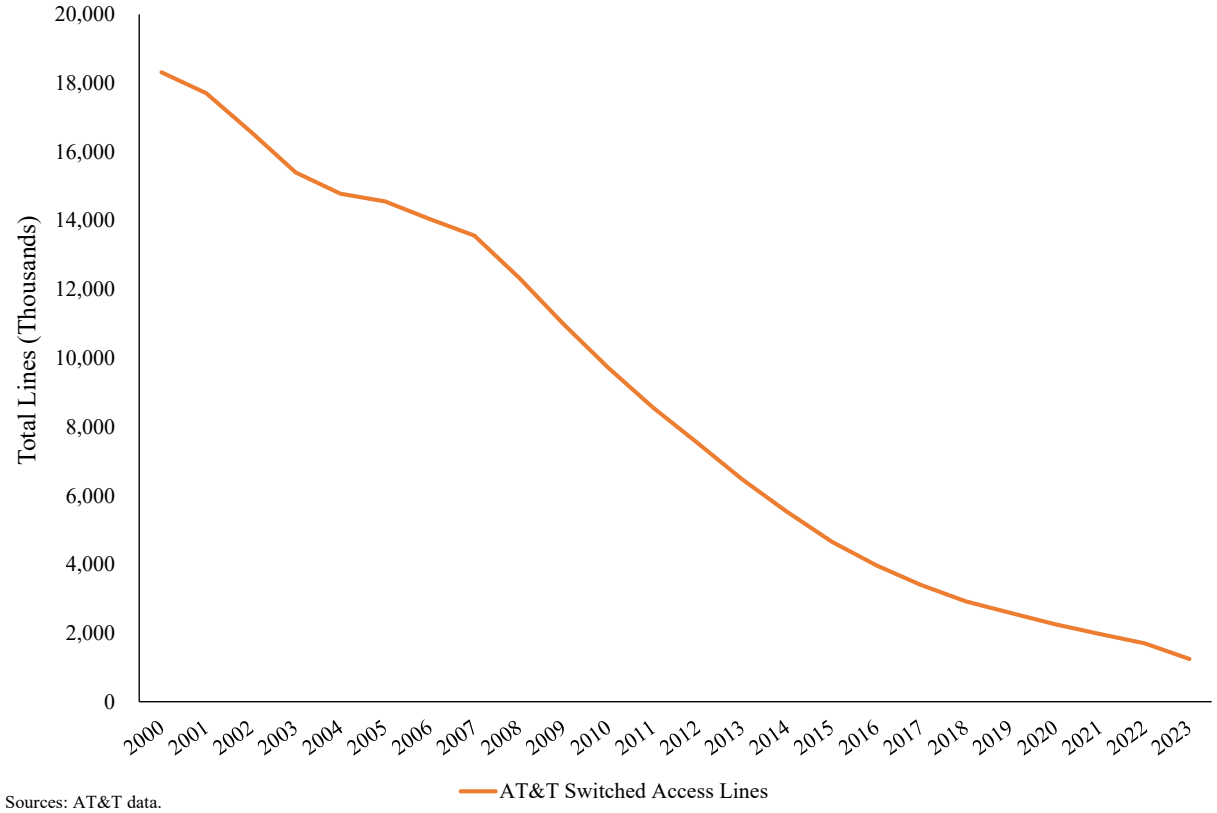
10. National Health Interview Survey Early Release Program, 2022 (available at https://www.cdc.gov/nchs/data/nhis/earlyrelease/Wireless_state_202406.pdf).

11. *Id*.

household in July-December 2023.[12] In general, the percentages of wireless-only adults are higher among younger generations, which indicates that the observed trends are likely to continue going forward.

20. AT&T's own data indicate that its POTS lines have been declining in California since at least 2000 (Figure 2 below). AT&T had 18.32 million residential and business POTS lines in 2000. In 2023, that number had fallen all the way to 1.24 million, *a decline of 93 percent*.

**Figure 2: AT&T Switched Access Lines (POTS) in California, 2000 – 2023**




Sources: AT&T data.

21. The VOIP and mobile technologies that are replacing POTS offer high-quality voice service with a range of features not offered with POTS. (To clarify, VOIP is a technology

12. National Health Interview Survey Early Release Program, July-December 2023, Table 1 (available at https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless202406.pdf).

and mobile is a mode of delivery of voice services. However, modern mobile plans also rely on a similar IP packet-switched technology—Voice Over LTE ("VOLTE") and Voice over New Radio ("VONR")—and thus have similar technological advantages.) For example, the distinction between long distance and local calls is effectively eliminated with VOIP and mobile plans.[13] In addition, VOIP and mobile providers typically include many other standard features such as three-way calling, caller ID, voicemail, and various call and voice mail management tools accessible either via phone or via Internet.[14] These new features are available with the new technologies in part because scaling of networks and integration of new features is more straightforward using modern technologies than using legacy POTS networks.

22. Mobile wireless technology—the voice service used by the vast majority of consumers today—has another obvious advantage over landline voice service: the ability to have a phone connection (with the same phone number) both at home and away from home. This advantage contributed to a substantial growth of mobile lines in service (Figure 1 above) in recent years. And while older mobile wireless technologies such as 2G or 3G suffered from some quality issues, modern mobile voice communications that rely on IP packet-switched networks have largely eliminated the issues that existed with older generations of mobile service.[15]

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13. See, *e.g.*, Guffey, Mary Ellen and Dana Loewy (2014), Essentials of Business Communication, 10th Ed., Cengage Learning, p. 8.

14. See, *e.g.*, "Difference between VoIP and POTS, Geeks for Geeks, Last Updated May 16, 2022, (available at https://www.geeksforgeeks.org/difference-between-voip-and-and-pots/).

15. See, *e.g.*, Kim, Dongwook "Communication services (VoLTE/VoNR)," 3GPP, January 5, 2024 (available at https://www.3gpp.org/technologies/volte-vonr). *See*, also, Andersen, Dave, "UK operators continue to improve the end-user mobile call experience," May 24, 2022 (available at https://rootmetrics.com/en-GB/content/UK-mobile-call-trends-2022). *See*, also, Contreras, Samuel, "VoLTE: How to use it and why you should care," December 19, 2022 Last Updated June 24, 2024 (available at https://www.androidcentral.com/volte). *See*, also, "Five benefits of VoLTE over traditional CS voice calls," GSMA Member Press Release, June 14, 2022 (available at https://www.gsma.com/membership/resources/five-benefits-of-volte-over-traditional-cs-voice-calls/). *See*, also, "Voice and communication services in 4G and 5G networks,"

23. The quality of the mobile and VOIP services is shown by the actual market experience. Mobile and VOIP are not bleeding-edge technologies used by a handful of risk-loving early adopters: Instead, the overwhelming majority of people use these technologies. VOIP and especially mobile have long since overtaken POTS. That is, POTS has been declining precisely because the technology has been surpassed by superior options. And there is no need to debate this in the abstract, as the data reveal the answer: The products in the marketplace—those shown to be superior—are those selected by the vast majority of consumers. There are few POTS lines still in service; that number is shrinking, and the vast majority of voice service is obtained through mobile wireless and VOIP. Indeed, for most people the only telephones they have are their mobile phones. Landline telephones have largely disappeared.

### 2. The great majority of people in California have access to multiple competing alternatives

24. The CPUC asks various questions related to whether there are areas where a COLR obligation may no longer be necessary, and how to identify such areas (*e.g.*, OIR questions a, c, and d). When analyzing those questions, it is useful to look at the current evidence as to which services and providers are available where. In this section, I show (using the current CPUC and FCC data) that AT&T's service territory is almost entirely covered by overlapping footprints of other voice service providers using both fixed and mobile technologies. For example, I find that more than 99 of the population within AT&T's service territory resides within census blocks with at least three alternative facilities-based providers of voice services.

25. I perform my analysis at the Census Block ("CB") level.[16] When summarizing my results, I present calculations based on both (i) the current population residing in CBs within AT&T's service territory,[17] which reflects the pool of potential customers whom AT&T would

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Ericsson White Paper, GFMC-284 23-3163 Uen Rev D, July 2022 (available at https://www.ericsson.com/en/reports-and-papers/white-papers/voice-and-communication-services-in-4g-and-5g-networks).

16. I use 2020 CB boundaries.

17. I rely on U.S. Census Bureau's ("Census") 2020 population estimates (available at https://www2.census.gov/geo/tiger/TIGER2020/TABBLOCK20/).

be required to serve if requested, and (ii) the number of actual AT&T POTS lines as of July 2024.

26. To define AT&T's service area, I first obtained AT&T's POTS service territory map from the FCC ("FCC Study Areas"), which depicts the service areas for all ILECs throughout the United States.[18] I then converted the FCC Study Areas data into CBs.[19] To do this, I first overlaid the map of AT&T's POTS areas with boundaries of CBs. I then classified CBs as either within AT&T's POTS service territory or outside of it. I consider CBs that even partially overlap with AT&T's service territory to be entirely within the service territory, even if less than the entire CB area is covered by AT&T's POTS service.[20]

27. I then compare the CB-level AT&T POTS service territory with footprints of other voice providers, based on maps of fixed broadband[21] and mobile coverage from the

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18. See, FCC Study Areas data (available at https://www.fcc.gov/economics-analytics/industry-analysis-division/study-area-boundary-data). As noted above, I use data specific to AT&T's subsidiary "Pacific Bell."

19. Available at https://www.fcc.gov/file/18873/download. Shapefiles define an area by specifying coordinates on map of a collection of geometric shapes (polygons). Such polygons may be overlaid with polygons representing other boundaries, such as CB boundaries or service maps of other providers.

20. More specifically, I calculate the percentage of the total area of each CB covered by AT&T's POTS service territory. Because some of the shapes (polygons) are cut imprecisely in the underlying data, and, additionally, because calculations of the areas of complex shapes involve approximations, the resulting calculated percentage overlap between AT&T's service territory and the CB boundaries sometimes includes a small amount of rounding error. To minimize the effect that the rounding error has on my analysis, I assume that any CB that does not have at least 0.1 percent of the area overlapping is not a part of AT&T's POTS service territory. Imposing this condition excludes only 0.2 percent of the total number of CBs.

21. Voice services can be provided over broadband, and broadband providers frequently provide stand-alone voice service as well; "broadband" is simply availability of data service of at least 200 kbps in at least one direction. *See*, California Broadband Data Processing and Validation, data as of December 31, 2020 (available at https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/communications-division/documents/broadband-mapping/california-broadband-data-processing-and-validation--2021-v22.pdf).

CPUC.[22] The CPUC fixed broadband map data list facilities-based broadband providers separately for each 2020 CB served and each technology type.[23] For each CB within AT&T's service territory, I count the number of providers offering fixed broadband services (which implies that they also have the ability to offer voice service). I count each provider only once per CB, even if that provider offers multiple technologies in a given CB. In my count of providers offering services within each CB, I exclude DSL service provided by AT&T, which relies on the same copper network as POTS. But I count service provided by AT&T using its fiber-optic network, as well as its fixed wireless services,[24] which represent alternatives to AT&T's POTS network. Such alternative AT&T networks are appropriately included in the analysis of voice alternatives available to customers within AT&T's service territory, as they would be service options even in the absence of POTS. Notably, while a customer with access to a broadband connection can obtain voice services from many providers, including, for example, multiple VOIP providers (as well as multiple mobile resellers), I conservatively count each connecting network as a *single* option for obtaining voice service (so, for example, I do not separately count multiple resellers of the same underlying network).

28. The CPUC mobile broadband data consist of maps showing mobile coverage boundaries of four facilities-based wireless service providers: AT&T Mobility, T-Mobile, U.S. Cellular, and Verizon Wireless.[25] I overlay each mobile provider's coverage map with the 2020

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22. Both fixed broadband service area maps and mobile broadband service area maps are available at CPUC Annual Collected Broadband Data (https://www.cpuc.ca.gov/industries-and-topics/internet-and-phone/broadband-mapping-program/cpuc-annual-collected-broadband-data). The data are as of December 31, 2021.

23. The CPUC provides fixed broadband data aggregated to the 2020 CB level. Technology codes follow FCC nomenclature. *See*, FCC Technology Codes Used in Fixed Broadband Deployment Data, Updated December 7, 2015 (available at https://www.fcc.gov/general/technology-codes-used-fixed-broadband-deployment-data).

24. The fiber-optic network is identified by technology code "50," and fixed wireless service is identified by technology code "70."

25. On May 28, 2024, U.S. Cellular announced that T-Mobile will acquire its mobile wireless operations, including customers, some of the cell towers and some of the spectrum assets. *See*, "US Cellular and TDS Announce Sale of Wireless Operations and Select Spectrum

CB boundaries and count how many mobile providers offer services in each CB within AT&T's service territory. I define CBs for which the mobile provider covers at least 90 percent of the area of the CB as within the mobile footprint of the given carrier.[26] Consistent with the discussion above, I include AT&T Mobility in my analysis as its services constitute an alternative option available to customers residing within AT&T's service footprint, which would be available even in the absence of POTS service.

29. Finally, AT&T has provided me addresses and geographic coordinates for all its POTS customer locations as of July 2024,[27] and I have mapped them to 2020 CBs.[28] As a result, I can quantify the alternatives available in CBs with AT&T POTS lines.

30. As Table 1 below demonstrates, 99.9 percent of the people within AT&T's POTS service territory have at least one alternative facilities-based broadband (and hence voice) option, 99.7 percent have at least two alternative facilities-based options, and 99.2 percent have at least three alternative facilities-based options. Similarly, 98.9 percent of AT&T residential and 99.6 percent of AT&T business POTS lines have at least one alternative facilities-based broadband option, 97.5 percent and 99.2 percent have at least two, and 95.2 percent and 98.3 percent have three or more.

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Assets to T-Mobile for Approximately $4.4 Billion in Cash and Assumed Debt," US Cellular Press Release, May 28, 2024 (available at https://investors.uscellular.com/news/news-details/2024/UScellular-and-TDS-Announce-Sale-of-Wireless-Operations-and-Select-Spectrum-Assets-to-T-Mobile-for-Approximately-4.4-Billion-in-Cash-and-Assumed-Debt/default.aspx). My results are not sensitive to inclusion of U.S. Cellular as an independent entity. In particular, 99.2 percent of the population within AT&T's POTS service territory have three or more alternative facilities-based options for voice service excluding U.S. Cellular.

26. The FCC uses a lower 50 percent threshold when aggregating various area characteristics not lining up perfectly with Census maps from smaller CBs to Census Block Groups or Census Block Tracts. See, *e.g.*, FCC 2018 Broadband Deployment Report at Appendix C, p. 57 (available at https://docs.fcc.gov/public/attachments/FCC-18-10A1.pdf).

27. The geographic coordinates were missing for some customers. I geocoded addresses for those customers.

28. Most likely due to address matching issues, such as issues caused by differences between billing and service addresses for customers, a small number of customer addresses map into CBs outside of AT&T's POTS service territory.

**Table 1: Facilities-Based Fixed and Mobile Broadband Coverage of AT&T's POTS Service Territory (Based on CPUC Broadband Data)**

| | Population | | AT&T POTS Residential Customer Lines | | AT&T POTS Business Customer Lines | |
|---|---|---|---|---|---|---|
| | # | % | # | % | # | % |
| **Total AT&T Service Territory** | **29,603,944** | **100.0%** | **460,041** | **100.0%** | **346,930** | **100.0%** |
| **Fixed or Mobile Broadband Carriers Other than AT&T POTS** | | | | | | |
| 1+ | 29,568,225 | 99.9% | 455,155 | 98.9% | 345,447 | 99.6% |
| 2+ | 29,511,126 | 99.7% | 448,469 | 97.5% | 343,995 | 99.2% |
| 3+ | 29,360,517 | 99.2% | 438,027 | 95.2% | 341,072 | 98.3% |

Sources: Census maps and population estimates 2020, FCC Study Areas maps, CPUC fixed and mobile broadband maps, AT&T POTS customer data as of July 2024.

Notes: An alternative provider is considered to be serving a Census Block if its service area covers at least 90% of the area of that Census Block. Excludes satellite providers and AT&T DSL. A provider is only counted once if it offers service of multiple different technologies to a given census block.

31. As an alternative data source, I analyzed the availability of alternative providers of voice services (as measured by broadband availability) based on the FCC Broadband Data Collection ("BDC") data as of December 2023.[29] The FCC BDC data are based on the location-level map called the Fabric.[30] As a result, these data are more granular in that individual "serviceable locations" are identified. The FCC BDC data report fixed broadband directly for each serviceable location by provider, including the details on the technology type and maximum speeds. Similarly to my analysis of the CPUC broadband data, I consider all providers and technologies except for AT&T's DSL service which is provided using the same infrastructure as POTS.[31] The FCC BDC reports its mobile broadband data in the form of maps. I overlaid these FCC maps with the FCC serviceable locations and flagged all locations that are served by each mobile wireless provider. Similarly to my analysis of the CPUC broadband data, I consider AT&T Mobility as an alternative to AT&T POTS.

29. *See*, FCC National Broadband Map (https://broadbandmap.fcc.gov/home).

30. *Id*.

31. I also exclude satellite broadband service from my analysis.

32. I analyze all FCC serviceable locations that fall within the CBs within AT&T's service territory. Table 2 below shows that 99.9 percent of the FCC serviceable locations within AT&T's service territory have at least one alternative provider, 99.7 percent have at least two alternative providers, and 99.2 percent have at least three alternative providers.

**Table 2: Facilities-Based Fixed and Mobile Broadband Coverage of AT&T's POTS Service Territory (Based on FCC BDC Data)**

| | Fabric Serviceable Locations | |
|---|---|---|
| | # | % |
| **AT&T's POTS Service Territory** | **7,443,569** | **100.00%** |
| **Fixed or Mobile Broadband Carriers Other than AT&T POTS** | | |
| 1+ | 7,434,268 | 99.9% |
| 2+ | 7,417,710 | 99.7% |
| 3+ | 7,380,674 | 99.2% |

Sources: FCC BDC data V4, CostQuest data, Census maps 2020, FCC Study Areas maps.
Notes: Excludes satellite providers and AT&T DSL. A provider is only counted once if it offers service of multiple different technologies to a given location.

33. As the data presented above demonstrate, the vast majorities of the population, of current AT&T POTS customer lines, and of individual serviceable locations within AT&T's service territory have multiple options for broadband (and hence voice services) from facilities-based providers. To the extent these data continue to be updated, such updates are likely to show still more complete coverage with competitive options, and, in any case, the CPUC may rely on the most current data available at the time when it makes a decision. Similarly, the precise criteria used to define "well-served" for the purposes of this proceeding can be determined by the CPUC.

### 3. These alternatives are affordable

34. In addition to availability, as discussed in the last section, it is also relevant to confirm that the alternative technologies are affordable. In this section I show that the high-quality alternatives to POTS are available at prices that are comparable to or lower than that for AT&T's POTS service.

35. Table 3 below shows prices of competing VOIP plans in areas where AT&T offers its POTS service.[32] It shows that there are both bundled and non-bundled voice alternatives costing a similar amount or less than the current $37.50 price of AT&T's residential POTS service in California.[33] Many of the alternatives also include long distance calling as part of the price, while AT&T's POTS plan does not, making them that much more affordable than POTS.[34]

**Table 3: Prices of VOIP Services Competing with AT&T POTS**

| Provider | Plan | Price | Bundled |
|---|---|---|---|
| **AT&T** | **POTS** | **$37.50/mo** | **No** |
| Comcast | Xfinity Voice Premier | $30/mo | No |
| Cox | Cox Voice Preferred | $20/mo | No |
| Astound | Home Phone | $10/mo | Yes |
| Spectrum | Spectrum Voice | $15/mo | Yes |
| Fidium Fiber | Home Phone Plan | $20/mo | Yes |
| Google Fiber | Home Phone Plan | $10/mo | Yes |

Sources: Carriers' websites accessed on September 16, 2024.

36. Similarly, major facilities-based mobile providers—AT&T Mobility, Verizon Wireless, T-Mobile, and DISH (Boost Mobile)—as well as mobile resellers offer a variety of

32. Some VOIP providers require address information before disclosing whether a service is available and at what price. An address with zip code 94124 was used for Comcast, an address with zip code 94105 was used for Astound, and an address with zip code 95834 was used for Fidium Fiber.

33. The current residential POTS monthly price is $37.50 in most AT&T California's exchanges. *See*, AT&T California tariff (available at https://cpr.att.com/pdf/ca/a005.pdf).

34. VOIP services generally require additional equipment, such as a modem, which is not required for POTS. Some providers give customers the option of either providing their own equipment or renting it from the provider. For example, Comcast allows customers to use their own equipment or offers to rent a Xfinity Gateway for $15 a month. Xfinity Gateway provides additional functionality in addition to handling voice traffic—it also serves as a broadband modem and wireless router. *See*, "Everything You Need to Always Stay in Touch," Xfinity (available at https://www.xfinity.com/learn/home-phone-services/equipment).

prepaid and postpaid mobile wireless plans at price points below those for AT&T's POTS service. Mobile wireless plans also generally include many features not available on POTS, such as bundled data allowances, device discounts, ability to tether other devices by using hotspot features of smartphones, free or discounted video streaming services, and free or discounted cloud storage. Prepaid plans typically have fewer additional features, but even the most basic prepaid plans typically include at least some bundled data service, making them superior to POTS on that dimension. However, because they usually have fewer additional features (including less data, which drives the cost and price of most postpaid mobile wireless plans), prepaid plans are more comparable to POTS, making them the natural basis for comparing mobile pricing to POTS pricing.

37. Following this logic, Table 4 below shows prices of basic prepaid plans offered by several mobile carriers in the United States, including prepaid plans from AT&T Mobility, Verizon Wireless, T-Mobile, and DISH (Boost Mobile) as well as prepaid plans from several resellers. As demonstrated by the table, prepaid plans are readily available from many carriers at price points comparable to or lower than AT&T's POTS service.

**Table 4: Prices of Prepaid Mobile Wireless Services Competing with AT&T POTS**

| Provider | Plan | Price | Hotspot | Multi-Month Plan |
|---|---|---|---|---|
| **AT&T** | **POTS** | **$37.50/mo** | **No** | **No** |
| AT&T Prepaid | 5GB | $30/mo | Yes | No |
| AT&T Prepaid | 8GB | $33/mo | Yes | Yes |
| AT&T Prepaid | 15GB | $40/mo | Yes | No |
| T-Mobile Prepaid | 10GB | $40/mo | Yes | No |
| Verizon Prepaid | Talk & Text | $35/mo | No | No |
| Verizon Prepaid | 15GB | $45/mo | Yes | No |
| Cricket Wireless | 5GB | $30/mo | No | No |
| Cricket Wireless | 10GB | $40/mo | No | No |
| Straight Talk | 10GB | $35/mo | Yes | No |
| Boost Mobile | 30GB | $25/mo | No | No |
| Metro by T-Mobile | Talk & Text | $25/mo | No | No |
| Metro by T-Mobile | 2GB | $30/mo | Yes | No |
| Metro by T-Mobile | 10GB | $40/mo | No | No |
| Mint Mobile | 5GB | $15-$20/mo | Yes | Yes |
| Mint Mobile | 15GB | $20-$25/mo | Yes | Yes |
| Mint Mobile | 20GB | $25-$35/mo | Yes | Yes |
| Mint Mobile | Unlimited | $30-$35/mo | Yes | Yes |

Sources: Carriers' websites accessed on September 16, 2024.

38. I include resellers in Table 4 above because they are relevant options available to consumers and, to the extent their prices are low this creates an affordable alternative. For example, Mint's plan costs substantially less than AT&T POTS at $15-$20 (depending on how many months are prepaid), while also providing the customer 5GB data allowance, which is a benefit not available with AT&T's POTS.

39. Some of AT&T's POTS customers qualify for a LifeLine discount.[35] However, there are several mobile service providers designated ETCs in California that are also offering

35. In California, wireline LifeLine customers may qualify for a discount of up to $19. See, *e.g.*, CPUC California LifeLine Eligibility (available at https://www.cpuc.ca.gov/consumer-support/financial-assistance-savings-and-discounts/lifeline/california-lifeline-eligibility).

LifeLine services that qualify for the same discount.[36] These mobile service providers collectively have more than 10 times the number of LifeLine subscribers as do all wireline providers collectively (1.42 million vs 126 thousand as of July 2024).[37] Six of these mobile service providers individually have more LifeLine subscribers than AT&T in California: TruConnect with more than 519,000, TracFone with more than 211,000, Infiniti Mobile with more than 143,000, Assurance Wireless with more than 119,000, Boomerang with more than 93,000, and Global Connection with more than 93,000, all compared to fewer than 83,000 LifeLine customers served by AT&T.

#### 4. The fact that competition has produced alternatives without a regulatory mandate means the economic justification for the COLR obligation no longer exists in many areas

40. The CPUC asks whether there are areas where the COLR obligation today no longer makes sense (*e.g.*, OIR questions a and d). I believe the evidence above indicates there are such areas. Today, there are many areas with multiple competitors for voice and data services (with voice in effect being a subset of data service today), each seeking customers, buying spectrum (if in the mobile space), and expanding capacity on their networks. The CPUC can determine precisely where it wishes to draw the line as to what constitutes a well-served area, but as a matter of economics, it seems clear that the COLR obligation today no longer makes sense in many such areas.

41. In terms of the scope of those areas, I provided data on the current situation above. It is equally important to note that the number and quality of alternatives continues to increase and improve. For example,

- Major mobile wireless providers T-Mobile and Verizon greatly expanded and improved their networks to accommodate a new type of broadband service—fixed

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36. The monthly discount is the same for mobile service—it is up to $19. See, *e.g.*, CPUC California LifeLine Eligibility (available at https://www.cpuc.ca.gov/consumer-support/financial-assistance-savings-and-discounts/lifeline/california-lifeline-eligibility).

37. https://www.cpuc.ca.gov/consumer-support/financial-assistance-savings-and-discounts/lifeline/lifeline-related-forms-and-notices-for-service-providers. The data are as of July 2024.

wireless. Combined, T-Mobile and Verizon had more than 9 million fixed wireless subscribers in the U.S. in the second quarter of 2024—a 23-fold increase from just three years ago (fewer than 400 thousand in the second quarter of 2021).[38]

- In just the past three years, a new mobile wireless provider, DISH (Boost Mobile), has deployed a modern 5G mobile wireless network to reach more than 240 million U.S. residents.[39]

- Providers are continuing to build and expand their high-speed fiber networks. For example, T-Mobile recently announced its intent to purchase a regional provider of fiber-based services, MetroNet. In their filing to the FCC, the parties noted that the proposed transaction will "aid in the deployment of broadband to underserved communities who do not have access to fiber today."[40]

42. Moreover, broadband providers have strong incentives to market their services aggressively to acquire new subscribers (and retain existing subscribers) in areas where they have facilities. These incentives exist because marginal costs of serving additional customers are

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38. T-Mobile and Verizon quarterly earnings reports. *See*, also, "Verizon has 150,000 fixed wireless access subs," LightReading, October 20, 2021 (available at https://www.lightreading.com/5g/verizon-has-150-000-fixed-wireless-access-subs).

39. *See*, Savldi, Aldo, "Dish Wireless just built a brand new cellular network. Now it needs customers — lots of them," Silicon Valley Business, August 9, 2023 (available at https://www.siliconvalley.com/2023/08/09/englewood-dish-wireless-new-cellular-network/) ("Dish Network, based in Englewood, pulled off what some observers thought it could never achieve. It built a state-of-the-art 5G cellular network reaching more than 240 million U.S. residents in three years for a fraction of what legacy wireless carriers have spent."). *See*, also, Hill, Kelly, "FCC confirms that Dish is meeting 5G deployment commitments," RCR Wireless News, October 3, 2023 (available at https://www.rcrwireless.com/20231003/test-and-measurement/fcc-confirms-that-dish-is-meeting-5g-deployment-commitments).

40. FCC, In the Matter of Metronet Holdings, LLC, Assignor and Transferor, MetroNet Systems Holdings, LLC, Assignee and Transferee, Joint Application for Consent to (1) Assign International Authority and (2) Transfer Control of International and Domestic Authority Pursuant to Section 214 of the Communications Act of 1934, as Amended August 8, 2024, p. 9 (available at https://www.fcc.gov/ecfs/document/1080843338601/1).

relatively low compared to the substantial fixed costs associated with building and maintaining a broadband network, meaning that incremental customers tend to generate profits for the provider.

43. Given the range of competitive options now in place, it is broadband competition that ensures access to high-quality voice service, and regulation limits and distorts that competition, instead of helping it. (See the discussion in Section II.B.) The fact that the vast majority of consumers have left POTS in favor of alternatives demonstrates that the market has produced voice alternatives that are competitively stronger than POTS.

44. Claims that a carrier's COLR obligation should only be relieved if another COLR is introduced are in tension with the deregulatory efforts to introduce competition over the past decades, efforts that seek to rely on market forces rather than regulation. The market and consumers have spoken with respect to the adequacy of competing voice services: Competition produced better quality products which are overwhelmingly preferred by consumers. Maintaining the COLR obligation in areas where there are many broadband (and hence voice) alternatives distorts competition and investment. Facilities are in place, providers compete for business, and even if a firm goes bankrupt, those facilities do not disappear. Allowing firms to relinquish COLR obligations with respect to legacy POTS where there are many broadband alternatives would reduce regulatory distortions, allow for efficient reallocation of scarce resources, incentivize investment by competitors, and thus enhance competition, benefit consumers, and serve the public interest.

#### 5. Many areas lack population, POTS customers, *and* serviceable locations

45. The second group of areas where it does not make economic sense to maintain a COLR obligation is where there is no demand for POTS service. Again, the CPUC can decide precisely how it wishes to define such areas, but as a matter of economics, it does not make sense to maintain outdated networks in areas where there is no reasonable prospect of those networks being used.

46. Three possible metrics that might be considered in that regard are: 1) whether the census records any population in a census block; *and* 2) whether there are any current POTS subscribers in a census block; *and* 3) whether the FCC has reported any serviceable locations in a census block. Table 5 below demonstrates that 16.8 percent of all census blocks within AT&T's

service territory satisfy all three criteria—they have no census-reported population, no current AT&T POTS customers, *and* no FCC-reported locations where service may be provided.

**Table 5: Census Blocks within AT&T's Service Territory Without Population, AT&T POTS Customers, and Serviceable Locations**

| | Census Block | |
|---|---|---|
| **Category** | **#** | **%** |
| **Total AT&T Service Territory** | **353,222** | **100%** |
| No Population And No AT&T POTS Customers And No Fabric Serviceable Locations | 59,457 | 16.8% |

Sources: FCC BDC data V4, CostQuest data, Census maps and population estimates 2020, FCC Study Areas maps, AT&T POTS customer data as of July 2024.

### B. THE HISTORICAL COLR OBLIGATION, AS APPLIED TODAY, CREATES REGULATORY DISPARITY, DISTORTS COMPETITION, AND LEADS TO INEFFICIENT INVESTMENT, ALL TO THE DETRIMENT OF CONSUMERS

47. With respect to the CPUC's questions about whether and where the COLR obligation still makes sense, it is critical to consider costs imposed by the regulation—costs that are of particular importance in areas where there is substantial competition. (This discussion is relevant to OIR questions a, b, and d.) The COLR obligation has its economic roots in a time when there was only one carrier and only one voice technology in any given area. But circumstances have changed dramatically: Competition is now intense, and there are superior alternative voice technologies available in almost all areas.[41] The obligation now creates significant economic distortions, given the ubiquity of superior alternative voice technologies and the strength of the associated competition.

41. *See*, FCC 2022 Communications Marketplace Report, FCC 22-103, December 30, 2022, ¶ 168 ("Although the public switched telephone network used to be the only means to connect, there now exist many other voice service options for consumers in the United States.").

48. COLR regulation traces its roots to English common law and the concepts of "common carrier" and "franchise."[42] Common carriers in many industries, including telecommunications, were essentially local monopolists who had exclusive access to customers within their franchise territories. Existence of such local monopolies was often justified by the relatively high fixed costs required to build and maintain the networks required for service. In the presence of a monopoly provider, a COLR obligation could ensure that no consumer could be denied service by that monopolist. Prices could be regulated so that: (i) consumers could obtain a reasonably priced service while (ii) the local monopolist could obtain a reasonable rate of return on investment. In this way, regulated monopolies are a kind of *quid pro quo*, in which a firm is granted the right to run the local monopoly, but in exchange it agrees to a variety of requirements on service and pricing, including the COLR obligation to provide service to any consumer in the service territory.

49. This set of circumstances obviously does not describe telecom today: Incumbents lost their local monopoly status in 1996 when the Telecommunications Act opened local markets for competition. Since then, superior telecom technologies have emerged and continued to evolve, *e.g.*, mobile and VOIP technologies. But regulations have failed to keep pace with these changes. Incumbent COLR providers have remained subject to obligations that the new competitors are not subject to, creating an unjustified and competitively harmful disparity, which distorts competition, leads to inefficient deployment of investment dollars, and harms consumers.

50. More specifically, the disparity imposes costs on incumbent COLR providers that the new competitors do not face. This has two economic effects. First, it constrains the incumbents and distorts competition. Second, it mandates an inefficient allocation of resources among different technologies. Both effects work to the overall detriment of consumers.

51. The classic economic example of buggy whips, used with horses and carriages, which faded away after the introduction of the internal combustion engine and automobiles, is relevant here. While consumers adopted automobiles at different times, and some might have

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42. See, *e.g.*, Lichtenberg, Sherry, "Carrier of Last Resort: Anachronism or Necessity?" National Regulatory Research Institute, Report No. 16-06, July 2016, pp. 5-7 (available at https://pubs.naruc.org/pub/FA85B978-00A3-862C-5E8D-9E10816FA7DB).

benefited from forced maintenance of buggy whip production for some period of time, a regulatory requirement to maintain buggy whip production once the automobile industry was established would have been inefficient and harmful to consumers, due to the dynamic nature of changing technologies. When older technologies become eclipsed by newer technologies, there are often transition periods when both exist at the same time, with market forces determining when and where each technology is offered, on what terms, and how the old technology is phased out. During that process, a core tenet of market economics is that investment will be efficiently allocated by market forces. Eventually, older technologies are retired completely when any remaining demand for them no longer justifies the investments required to provide them. During the transition process from one technology to the next, there may still be people who would like to use the older technology if they could get it at the price charged when it was widely available. But as demand for the product evaporates, and economies of scale in producing the product likewise disappear, it can become uneconomic for the product to be produced at all—and certainly uneconomic for it to be provided at historical prices—and thus the product fades away in favor of newer, more popular technologies.

52. This process of Schumpeterian "creative destruction" is the essence of competition and the engine of technological progress. But it can be distorted—to the detriment of consumers—by regulation. If companies are forced to provide a legacy technology when market forces would otherwise have resulted in that technology being retired, that is, by definition, a market distortion. In such a case, investment is being made based on regulatory requirements, not market forces, and investment cannot follow demand as efficiency dictates it should. If a buggy whip manufacturer that started to make automobiles were required by regulation to maintain its legacy buggy whip manufacturing facilities in their entirety, year after year, in addition to the company's new automobile manufacturing facilities, it is readily apparent that (i) economic resources that market forces would otherwise efficiently allocate to newer technologies would be wasted, and (ii) the company would be at a clear disadvantage relative to automobile manufacturers that do not have to also maintain buggy whip manufacturing facilities. Because resources inefficiently devoted to maintaining the dying technology are resources diverted from more efficient uses, such as advancing the newer technologies, this slowing of the Schumpeterian process ultimately harms everyone.

53. In the present context, there are two primary economic distortions of concern. First, carriers subject to historical COLR requirements are inefficiently investing in legacy networks that market forces would otherwise be retiring (the TDM networks that underlie POTS) in favor of the newer networks and technologies. This reduces investment in the new networks and technologies and slows overall technological progress, to the detriment of all in the long-run.

54. Second, the requirement applies only to a single firm in an area (*e.g.*, AT&T, the legacy ILEC), not to its competitors. This inhibits competition by impeding the regulated firm and thus both prevents the regulated firm from allocating resources optimally, and it also discourages investment by unregulated firms, as they do not need to compete as vigorously as they would have to if the regulated firm were not operating under the regulatory constraint. More vigorous competition benefits consumers.

55. This regulatory impediment can manifest in a variety of ways. Even putting aside the clear effects on invested capital, scarce managerial and engineering time must go to the dying legacy product—scarce resources that otherwise would go to products that are actually competitively relevant going forward. As a result, the firm with the regulatory requirement will struggle under an inefficient allocation of human and financial resources, which will cause it to lag behind where it otherwise would be with respect to the new technologies. Moreover, the mandated inefficiency in investment and operations can also make it more difficult for the firm to attract investment dollars. All else equal, outside investors will prefer to invest in firms that are not subject to regulatorily-mandated inefficiency. Similarly, new recruits generally prefer to work at a company where their career paths are not at risk from being assigned to work on dying technology. When it comes to financial and human resources—which are both critical to compete effectively—a firm that must divert resources to a dying legacy technology is at an inherent competitive disadvantage to firms that do not need to do so. And placing one firm at an asymmetric competitive disadvantage is bad for consumers because it negatively affects the overall competitive process by reducing competitive pressure on other firms.

56. Reallocation of investment dollars to newer technologies would also accelerate technological advancement. Newer fixed broadband and mobile technologies offer significant technological advantages over legacy POTS on the network side, including more efficient use of bandwidth and integration of additional functionality. When a call is initiated over a traditional

circuit-switched network, a circuit is established between the parties of the call, and the entire bandwidth of the circuit is reserved for the call. In contrast, modern voice technologies rely on IP to transmit digitized signals in the form of "packets," which does not require the dedication of an entire circuit to one call, but rather consumes only the bandwidth required for movement of IP packets related to the call.[43, 44] Due to advances in IP networking over the past decades, transmission of data over the Internet has significant cost and flexibility advantages over relying on a dedicated network that is used only for (or primarily for) voice communications. In addition, managing VOIP connections is cheaper because it relies heavily on software as opposed to (more expensive) hardware.

57. Modern fiber networks are also more future-proof relative to legacy TDM networks. End-to-end fiber networks can be scaled up relatively quickly and inexpensively by replacing equipment attached to both ends of optical fibers, without the need to lay new fiber.[45] The shift to the so-called Software-Defined Networking ("SDN") architecture, which relies on software as opposed to hardware for network control, also improves upgradability and allows network operators to roll out new services quickly and efficiently.[46]

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43. See, *e.g.*, Almeida, Fernando, and José Cruz (2014), "Mitigation of Security Concerns of VoIP in the Corporate Environment." In Organizational, Legal, and Technological Dimensions of Information System Administration, (Portela, Irene Maria, and Fernando Almeida, Eds.), IGI Global, p. 258. *See*, also, "Difference between VoIP and POTS," Geeks for Geeks, Last Updated May 16, 2022, (available at https://www.geeksforgeeks.org/difference-between-voip-and-and-pots/).

44. See, *e.g.*, Kumar, Anuj (2011), Security and Risk Challenges of Voice over IP Telephony." *International Journal of Electronics Engineering*, 3(1):85-87, pp. 85-86.

45. National Telecommunications and Information Administration (NTIA), U.S. Department of Commerce, Notice of Funding Opportunity, NTIA-BEAD-2022, May 3, 2022, pp. 14, 42 (available at https://broadbandusa.ntia.doc.gov/sites/default/files/2022-05/BEAD%20NOFO.pdf). See, also, Hardesty, Linda, "AT&T upgrades its fiber network to offer 2-Gig, 5-Gig speeds," Fierce Telecom, January 24, 2022 (available at https://www.fiercetelecom.com/broadband/att-upgrades-its-fiber-network-offer-2-gig-5-gig-speeds).

46. *See*, Heynen, Jeff, "Telcos' Tipping Point: 10G Fiber and Software-Defined Access," Dell'Oro Group, December 11, 2020, (available at https://www.delloro.com/knowledge-

58. In any given area, one entity is the COLR, and the other entities, including competing mobile, cable, and satellite providers of voice service, do not have to spend significant resources maintaining legacy networks. If the COLRs were able to operate in a more market-driven fashion, without regulatory distortion to investment, that would not only enable them to allocate investment dollars more efficiently—based on market forces rather than regulatory mandate—but it would also put increased pressure on their competitors to invest more themselves in response to stronger competition from the COLR. Consumers in California would benefit from such enhanced competitive pressure and the associated improvement in allocation of investment dollars.

59. Claims that it is costless today to be under a COLR obligation, or even beneficial, are contradicted by the real-world behavior of carriers. When AT&T recently sought to have its COLR obligation removed, no carrier volunteered to become a replacement COLR.[47] This is consistent with the costs of a COLR obligation today exceeding the potential benefits.

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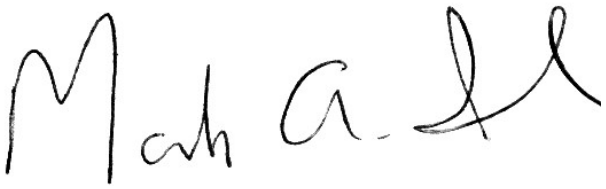
center/white-papers/telcos-tipping-point-10g-fiber-and-software-defined-access-2/). *See*, also, Zhao, Yongli, Yuqiao Wang, Wei Wang & Xiaosong Yu, "Software-Defined Optical Networks (SDON): Principles and Applications," *Optical Fiber and Wireless Communications*, June 21, 2017 (available at https://www.intechopen.com/chapters/54939).

47. The CPUC noted in its decision to deny AT&T's application to withdraw as a COLR that no potential COLR responded to the notification distributed by the CPUC. *See*, CPUC's Decision Dismissing with Prejudice the Application of AT&T California to Withdraw as a Carrier of Last Resort, Application 23-03-003, June 20, 2024, p. 5.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.



9/30/2024

Mark A. Israel

Date

**ATTACHMENT A: CURRICULUM VITAE**

# Mark A. Israel

**September 2024**

## President, Compass Lexecon

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## AREAS OF ECONOMIC EXPERTISE

- Antitrust and competition economics; industrial organization economics
- Applied econometrics
- Economic and econometric analysis of horizontal and vertical mergers
- Economic and econometric analysis of antitrust litigation topics, including: Class certification, damages, and liability issues in cases involving price fixing, exclusive dealing, monopolization, bundling, price discrimination, and exclusionary practices

## INDUSTRIES OF PARTICULAR EXPERTISE AND CASE HIGHLIGHTS

- Particular expertise in industries including: Wireline and wireless telecommunications, media, advertising, sports, airlines, railroads, and other transportation services.
- Additional extensive experience in industries including: Internet, software, and other high technology markets; financial markets; credit cards; insurance markets; healthcare; biotech; distribution services; energy markets; metals; hotels; rental cars, and consumer retail.
- Selected case highlights: CCB v. Rogers/Shaw; NFL Sunday Ticket Antitrust Litigation; DOJ v. Google Search Litigation; DOJ v. AA/JetBlue JV; PGA Tour v. LIV Golf; Viamedia v. Comcast; Capacitors Price Fixing Jury Trial; Rail Fuel Surcharge Litigation; Verizon-Tracfone Hearings; Sprint-T-Mobile Hearings; DOJ v. AT&T/Time Warner; AA-US Airways Merger; Comcast-NBCU Merger; DOJ Oneworld Airline Alliance Investigation.
- Research published in leading scholarly and applied journals including *The American Economic Review*, *The Rand Journal of Economics*, A*ntirust Law Journal, The Journal of Competition Law and Economics, and The Review of Network Economics.*
- Co-author of the chapter on Econometrics and Regression Analysis in the ABA Treatise, *Proving Economic Damages: Legal and Economic Issues,* 2017.

## EDUCATION

- Ph.D., Economics, STANFORD UNIVERSITY, June 2001.
- M.S., Economics, UNIVERSITY OF WISCONSIN-MADISON, August 1992.
- B.A., Economics, ILLINOIS WESLEYAN UNIVERSITY, Summa Cum Laude, May 1991.

## EMPLOYMENT HISTORY

Compass Lexecon: *President and Member of Three-Person Global Executive Committee,* December 2023 – Present.

Previously: *Senior Managing Director and Head of Compass Lexecon North American Antitrust Practice*, January 2016 – December 2023; *Executive Vice President*, April 2013 – December 2015; *Senior Vice President*, January 2009 – March 2013; *Vice President*, January 2008 – December 2008; *Economist*, January 2006 – December 2007.

Kellogg School of Management, Northwestern University: *Associate Professor of Management and Strategy*, 2007 – 2008; *Assistant Professor of Management and Strategy*, 2000 – 2006.

State Farm Insurance: *Research Administrator*, August 1992 – August 1995.

## RECENT PROFESSIONAL RECOGNITIONS

Global Competition Review, Economist of the Year, 2023.

Who's Who Legal, Global Elite Thought Leader: 2022, 2023, 2024.

Who's Who Legal, Thought Leader in USA Competition, 2024.

Who's Who Legal, Thought Leader in Competition: 2019, 2020, 2022, 2023.

Who's Who Legal, Expert Witness in Arbitration: 2024.

## LIVE TESTIMONIAL EXPERIENCE

Testimony as Economic Expert on behalf of Google LLC, In the Matter of *United States of America et al. v. Google, LLC*, In the United States District Court for the Eastern District of Virginia Alexandria Division, Case No. 1:23-cv-00108-LMB-JFA, Deposition: March 14, 2024; Live Testimony: September 26, 2024.

Testimony as Economic Expert on behalf of The Kroger Company and Albertsons Companies, Inc., In the Matter of *FTC et al. v. Kroger and Albertsons*, In the United States District Court District of Oregon Portland Division, Case No. 3:24-cv-00347-AN, Deposition: July 22, 2024; Economic Expert Tutorial: July 26, 2024; Live Testimony: September 11, 2024.

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Testimony as Economic Expert on behalf of AT&T, Application of Pacific Bell Telephone Company d/b/a AT&T California (U1001) To Relinquish Its Eligible Telecommunications Carrier Designation, Before the Public Utilities Commission of the State of California, A.23-03-002, Rebuttal Testimony: January 19, 2024; Live Testimony at Evidentiary Hearing: April 9, 2024.

Testimony as Economic Expert on behalf of Trinity, In the Matter of *Commonwealth of Virginia, Ex. rel. and Joshua Harman v. Trinity Industries, Inc. et al. and Trinity Highway Products, LLC*, In the Circuit Court for the City of Richmond, Case No. CL 13-698, Deposition: January 30, 2024.

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Testimony as Economic Expert on behalf of AT&T, Application of Pacific Bell Telephone Company d/b/a AT&T California (U 1001 C) for Targeted Relief from Its Carrier of Last Resort Obligation and Certain Associated Tariff Obligations, Before the Public Utilities Commission of the State of California, A.23-03-003, Opening Testimony: December 19, 2023.

Testimony as Economic Expert on behalf of Express Scripts, Inc., In the Matter of *Series 17-03-615, a designated series of MSP Recovery Claims, Series LLC et al. v. Express Scripts, Inc. et al.*, In the United States District Court for the Northern District of Illinois Western Division, Case No. 3:20-cv-50056, Deposition: December 7, 2023.

Testimony as Economic Expert on behalf of IQVIA Holdings Inc. and Propel Media, Inc., In the Matter of *Federal Trade Commission v. IQVIA Holdings Inc. and Propel Media, Inc.*, In the United States District Court for the Southern District of New York, Case No. 1:23-cv-06188-ER, Deposition: November 9, 2023; Live Trial Testimony: November 30, 2023.

Testimony of as Economic Expert on behalf of Light & Wonder, Inc., In the Matter of an Arbitration between *Mohawk Gaming Enterprises, LLC, d/b/a Akwesasne Mohawk Casino Resort, on Behalf of Itself and All Others Similarly Situated and Light & Wonder, Inc., a Nevada Company, Formerly a Delaware Corporation, and LNW Gaming Inc., a Nevada Corporation*, American Arbitration Association, Case No. 01-20-0015-6196, and *In Re Automatic Card Shufflers Litigation*, In the United States District Court Northern District of Illinois Eastern Division, Case No. 1:21-cv-1798, Deposition: November 13, 2023.

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Testimony as Economic Expert on behalf of Nippon Chemi-Con and United Chemi-Con, *In Re Capacitors Antitrust Litigation,* No. C 14-3264-JD, and *In Re Capacitors Antitrust Litigation (No. III)*, No. MD 17-2801 JD, United States District Court for the Northern District of California Division, No. C 14-3264-JD, Deposition: March 14, 2020; Live Jury Trial Testimony: December 8, 2021.

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Testimony as Economic Expert on behalf of the Joint Defense Group, In the Matter between *Cygnus Electronics Corporation and Sean Allott and Panasonic Corporation et al.*, In the Ontario Superior Court of Justice, Court File No. 3795-14 CP, Deposition: September 29, 2021.

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Testimony as Economic Expert on behalf of Joint Applicants, In the Proposed Merger of T-Mobile US, Inc. and Sprint Communications, Inc., Public Utilities Commission, State of California, San Francisco, California, Docket Nos. A.18-07-011 and A.18-07-012, Direct Rebuttal Testimony: January 29, 2019; Live Testimony: February 7, 2019; Direct Supplemental Testimony: November 7, 2019.

Testimony as Economic Expert on behalf of Turner Network Sales, Inc., In the Matter of *DISH Network L.L.C. v. Turner Network Sales, Inc.*, JAMS Arbitration No. 1100103066, Deposition: August 9, 2019; Live Trial Testimony: August 29, 2019.

Testimony of Economic Expert on behalf of Marriott Vacations Worldwide Corporation et al., In the Matter of *RCHFU, LLC et al. v. Marriott Vacations Worldwide Corporation et al.*, In the United States District Court for the Eastern District of Colorado, Civil Action No. 1:16-cv-01301-PAB-GPG, Deposition: July 12, 2019.

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Testimony as Economic Expert on behalf of Energy Solutions, Inc., In the Matter of the *United States of America v. Energy Solutions, Inc., Rockwell Holdco, Inc., Andrews County Holdings, Inc., and Waste Control Specialists, LLC*, In the United States District Court for the District of Delaware, Civil Action No. 16-cv-01056-SLR, Deposition: April 17, 2017; Live Trial Testimony: May 2, 2017; May 3, 2017.

Testimony as Economic Expert on behalf of Facebook, Inc., In the Matter of *Social Ranger, LLC v. Facebook, Inc.*, In the District Court of Delaware, C.A. No. 14-1525-LPS, Deposition: March 6, 2017.

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Testimony of Dr. Mark A. Israel, In the Matter of *Distribution of Cable Royalty Funds*, Before the Copyright Royalty Judges, Washington, D.C., No. 14-CRB-0010-CD, September 15, 2017; Written Direct Testimony: December 22, 2016.

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Testimony as Economic Expert on behalf of Federal Trade Commission, In the Matter of *Federal Trade Commission et al. v. Sysco Corporation and USF Holding Corp.*, Civil Action No. 15-cv-00256 (APM), Deposition: April 28, 2015; Live Trial Testimony: May 7, 2015; May 8, 2015; May 14, 2015.

Appearances in Federal Communications Commission, Economists Panels:

- Comcast/Time Warner, January 2015
- AT&T/T-Mobile, July 2011
- Comcast/NBCUniversal, August 2010

Appearance before California Public Utility Commission, Public Hearings on Comcast/Time Warner Merger, Los Angeles, April 2015.

Appearance as Economic Expert in front of Department of Justice, Federal Trade Commission, Federal Communications Commission, and State Regulatory Agencies in many additional transactions, including: Danaher/NetScout, AT&T/Leap Wireless, T-Mobile/MetroPCS, American Airlines/US Airways, SpectrumCo/Cox/Verizon Wireless, oneworld antitrust immunity application, PepsiCo/bottlers, Houghton Mifflin/Harcourt, Chicago Mercantile Exchange/Chicago Board of Trade.

## EXPERT REPORTS, AFFIDAVITS, AND DECLARATIONS

Expert Report of Mark A. Israel, Ph.D., In the Matter of *10X Genomics, Inc. and President and Fellows of Harvard College v. Vizgen, Inc.; Vizgen, Inc. v. 10X Genomics, Inc. and President and Fellows of Harvard College (Counterclaim)*, In the United States District Court for the District of Delaware, Civil Action No. 22-595-MFK, September 25, 2024.

Expert Report of Dr. Mark A. Israel, In the Matter of *State of Washington v. The Kroger Co. et al.*, In the State of Washington King County Superior Court, Case No. 24-2-00977-9 SEA, July 12, 2024.

Expert Report of Dr. Mark A. Israel, In the Matter of *State of Colorado ex rel. Philip J. Weiser, Attorney General v. The Kroger Co.; Albertsons Companies, Inc.; and C&S Wholesale Groceries, LLC*, In the District Court, City and County of Denver, Colorado, Case No. 24CV30459, July 8, 2024.

Expert Report of Dr. Mark A. Israel, In the Matter of *The Kroger Company and Albertsons Companies, Inc.*, In the United States of America Federal Trade Commission Office of Administrative Law Judges, Docket No. 9428, July 5, 2024.

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Expert Reports of Mark A. Israel, Ph.D., *In Re Dealer Management Systems Antitrust Litigation*, United States District Court for the Northern District of Illinois Eastern Division, MDL 2817, No. 1:18-CV-864, Initial Report: August 26, 2019; Reply Report: December 19, 2019; Supplemental Report: November 21, 2023; Supplemental Reply Report: April 11, 2024; Supplemental Sur-Reply Expert Report: June 10, 2024.

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Expert Report of Mark A. Israel, In the Matter of *United States of America et al. v. Google LLC*, In the United States District Court for the Eastern District of Virginia, Case No. 1:23-cv-00108 (LMB/JFA), January 23, 2024.

Declaration of Mark Israel, Bryan Keating, and Allan Shampine, In the Matter of *Safeguarding and Securing the Open Internet*, Before the Federal Communications Commission, WC Docket No. 23-320, December 14, 2023.

Expert Report(s) of Mark A. Israel, Ph.D., *In Re Rail Freight Fuel Surcharge Antitrust Litigation (No. II)*, In the United States District Court for the District of Columbia, MDL Docket No. 2925, Misc. No. 20-8 (BAH), Initial Report: August 15, 2023; Supplemental Report: December 13, 2023.

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Expert Report of Mark A. Israel, In the Matter of *Series 17-03-615, a designated series of MSP Recovery Claims, Series LLC et al. v. Express Scripts, Inc. et al.*, In the United States District Court for the Northern District of Illinois Western Division, Case No. 3:20-cv-50056-IDJ-LAJ, November 13, 2023.

Submission of Mark A. Israel and Bryan G. M. Keating, "An Economic Analysis of TTC Wireless Access," In the Matter of *Conditions of License relating to the Provision of Services within the Toronto Transit Commission (TTC) Subway System* and In the Matter of *Arbitration Rules and Procedures for Provision of Service within the Toronto Transit Commission (TTC) Subway System*, Between Telus Communications Inc. and Bell Mobility Inc. and Rogers Communications Inc., November 10, 2023.

Verified Statement of Mark A. Israel, Ph.D., "Reciprocal Switching for Inadequate Rail Service," Surface Transportation Board, Docket No. EP 711 (Sub-No. 2), November 6, 2023.

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Expert Report of Mark A. Israel, Ph.D., In the Matter of *Pluspass, Inc. v. Verra Mobility Corp. et al.*, In the United States District Court Central District of California – Western Division, No. 2:20-cv-10078-FWS-SK, May 10, 2023.

Declarations of Mark A. Israel on behalf of AT&T, Application of Pacific Bell Telephone Company d/b/a AT&T California (U 1001 C) for Targeted Relief from Its Carrier of Last Resort Obligation and Certain Associated Tariff Obligations, Before the Public Utilities Commission of the State of California, A.23-03-003, Declaration: March 3, 2023; Reply Declaration: April 17, 2023; Amended Declaration: May 17, 2023.

Expert Report of Mark A. Israel, Ph.D., In the Matter of *TCS John Huxley America, Inc.; TCS John Huxley Europe Limited; TCS John Huxley Asia Limited; and Taiwan Fulgent Enterprise Co., Ltd. Vs. Scientific Games Corporation; Bally Technologies, Inc., d/b/a SHFL Entertainment or Shuffle Master; and Bally Gaming, Inc., d/b/a Bally Technologies, f/k/a Bally Gaming and Systems, f/k/aa SHFL Entertainment, Inc., f/k/a Shuffle Master, Inc.,* In the United States District Court for the Northern District of Illinois Eastern Division, Case No. 1:19-CV-01846, April 14, 2023.

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Expert Reports of Mark A. Israel, In the Matters of *United States of America et al. v. Google LLC* (Case No. 1:20-cv-03010-APM), and *State of Colorado et al. v. Google LLC* (Case No. 1-20-cv-03715-APM), In the United States District Court for the District of Columbia, Initial Report: June 4, 2022; Rebuttal Report: August 5, 2022; Reply Report: September 23, 2022.

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Verified Statement of Mark A. Israel, Ph.D., "Reciprocal Switching," Surface Transportation Board, Docket No. EP 711 (Sub-No. 1), February 14, 2022.

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Expert Report of Mark A. Israel, In the Matter of *B & R Supermarket, Inc., d/b/a Milam's Market, Grove Liquors LLC, Strouk Group LLC, d/b/a Monsieur Marcel, and Palero Food Corp. and Cagueyes Food Corp., d/b/a Fine Fare Supermarket v. Mastercard International Inc., Visa Inc., Visa U.S.A., Inc., Discover Financial Services, and American Express Company*, In the United States District Court for the Eastern District of New York, Case No. 17-CV-02738 (MKB) (JO), March 22, 2021.

Expert Report of Dr. Mark A. Israel, In the Matter of *Joshua M. Harman Qui Tam v. Trinity Industries, Inc. et al.,* In the Commonwealth of Massachusetts, Superior Court Department, Civil Action No. 2014-02364-D, February 26, 2021.

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Expert Report of Mark A. Israel, Ph.D., *In Re Comtech/Gilat Merger Litigation*, Court of Chancery of the State of Delaware, Consolidated C.A. No. 2020-0605-JRS, September 24, 2020.

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Submission of Philip Haile and Mark Israel, "Alternative Approaches to Airport Slot Allocation: Objectives and Challenges," Department for Transport, United Kingdom, June 20, 2019.

Submission of Mark A. Israel, Maya Meidan, and Robert J. Calzaretta, Jr., "The Atlantic Joint Business Has Not Harmed Competition on Nonstop Overlap Routes, Including Focus Routes," Competition and Markets Authority, United Kingdom, June 14, 2019.

Expert Reports of Mark A. Israel, In the Matter of *RCHFU, LLC et al. v. Marriott Vacations Worldwide Corporation et al.,* In the United States District Court for the District of Colorado, Civil Action No. 16-01301-PAB-GPG, Initial Report: December 28, 2018; Supplemental Rebuttal Report, June 14, 2019.

Submission of Mark Israel, "The Fidelity/Stewart Merger Does Not Raise Competitive Concerns in the New York Title Insurance Industry," Revised Section 1506 Application Regarding the Proposed Acquisition of Stewart Title Insurance Company by Fidelity National Financial, Inc., New York State Department of Financial Services, April 12, 2019.

Second Report of Dr. Mark A. Israel, Between *UK Trucks Claim Limited and (1) – (5) Fiat Chrysler Automobiles NV and (1) – (4) MAN Truck & Bus AG & ORS*, In the Competition Appeal Tribunal, Case No. 1282/7/7/18, April 11, 2019.

Expert Report of Mark A. Israel, In the Matter between *Ryan Kett, Erik Oun and Jim Wong and Kobe Steel, Ltd., Shinko Metal Products Co., Ltd., Shinko Aluminum Wire Co., Ltd., Shinko Wire Stainless Company, Ltd., Kobelco & Materials Copper Tube Co., and Nippon Koshuha Steel Co., Ltd.*, In the Supreme Court of British Columbia, Case No. S-1710805, March 28, 2019.

Expert Report of Dr. Mark A. Israel, Between *Road Haulage Association and (1) – (10) MAN SE and Others and (1) Daimler AG, (2) Volvo Lastvagnar Aktiebolag*, In the Competition Appeal Tribunal, Case No. 1289/7/7/18, March 22, 2019.

Submission of Robert J. Calzaretta, Jr., Mark A. Israel, and Maya Meidan, "Assessing the Effects of ATI and JV Overlaps on Nonstop Fares: An Event Study Approach," submitted as part of a Supplement to Joint Motion to Amend Order 2010-7-8 for Approval of and Antitrust Immunity for Amended Joint Business Agreement, In the Application of American Airlines, Inc., British Airways PLC, OpenSkies SAS, Iberia Líneas Aéreas de España, S.A., Finnair OYJ, Aer Lingus Group DAC, Before the U.S. Department of Transportation, Washington, DC, Docket DOT-OST-2008-0252-, January 11, 2019.

Declarations of Mark A. Israel, In the Matter of *Oscar Insurance Company of Florida v. Blue Cross and Blue Shield of Florida, Inc., d/b/a Florida Blue; Health Options Inc., d/b/a Florida Blue HMO; and Florida Health Care Plan Inc., d/b/a Florida Health Care Plans,* In the United States District Court Middle District of Florida Orlando Division, Case No. 6:18-cv-01944, Declaration: November 19, 2018; Supplemental Declaration: December 21, 2018.

Reply Declaration of Mark Israel, Michael Katz, and Bryan Keating, In the Matter of Applications of T-Mobile US, Inc. and Sprint Corporation, Consolidated Applications for Consent to Transfer Control of Licenses and Authorizations, Federal Communications Commission, WT Docket No. 18-197, September 17, 2018.

Expert Report of Gustavo Bamberger, Robert Calzaretta, and Mark Israel, In the Joint Application of Hawaiian Airlines, Inc. and Japan Airlines, Co., Ltd., Appendix 6 to "Joint Application for Approval of and Antitrust Immunity for Alliance Agreements," Department of Transportation, Case No. DOT-OST-2018-0084, June 13, 2018.

Expert Reports of Mark A. Israel, In the Matter between *Cygnus Electronics Corporation and Sean Allott and Panasonic Corporation et al.,* In the Ontario Superior Court of Justice, Court File No. 3795/14CP, Initial Report: November 17, 2017; Reply Report: February 23, 2018; Supplemental Report: May 22, 2018.

Expert Report of Mark A. Israel, In the Matter of the *Federal Trade Commission v. Wilh. Wilhelmsen Holding ASA Wilhelmsen Maritime Services As Resolute Fund II, L.P. Drew Marine Intermediate II B.V. and Drew Marine Group, Inc.*, In the United States District Court for the District of Columbia, No. 1:18-cv-00414-TSC, May 11, 2018.

Declaration of Mark A. Israel, In the Matter between *Robert Foster and Murray Davenport and Sears Canada Inc. et al.*, In the Ontario Superior Court of Justice, Court File No. 766-2010 CP, November 1, 2017.

Expert Report of Mark Israel and Bryan Keating, "Economic Analysis of Dr. Evans' Claims as They Relate to *Restoring Internet Freedom*," Federal Communications Commission, WC Docket No. 17-108, October 31, 2017.

Declaration of Mark A. Israel, Allan L. Shampine, and Thomas A. Stemwedel, In the Matter of *Restoring Internet Freedom*, Federal Communications Commission, WC Docket No. 17-108, July 17, 2017.

Expert Report of Dr. Mark A. Israel, In the Matter of *St. Clair County, Illinois, and Macon County, Illinois, Individually and on behalf of all other counties in the State of Illinois, v. Trinity Industries, Inc. and Trinity Highway Products, LLC*, In the United States District Court for the Southern District of Illinois, Civil Action No.: 3:14-cv-1320, April 25, 2017.

Expert Reports of Mark A. Israel, In the Matter of the *United States of America v. Energy Solutions, Inc., Rockwell Holdco, Inc., Andrews County Holdings, Inc., and Waste Control Specialists, LLC*, In the United States District Court for the District of Delaware, Civil Action No. 16-cv-01056-SLR, Initial Report: March 27, 2017; Rebuttal Report: April 10, 2017.

Expert Report of Mark A. Israel, In the Matter of *Jackson County, Missouri, Individually and on behalf of a class of others similarly situated, v. Trinity Industries, Inc., and Trinity Highway Products, LLC*, In the Circuit Court of Jackson County, Missouri at Independence, Case No. 1516-CV23684, March 24, 2017.

Expert Report of Mark A. Israel, In the Matter of *Honeywell International Inc. v. iControl Networks, Inc. and Alarm.com Holdings, Inc.*, In the United States District Court for the District of New Jersey, No. 2:17-cv-01227, February 26, 2017.

Expert Report of Mark Israel, In the Matter of *Social Ranger, LLC v. Facebook, Inc.*, In the United States District Court for the District of Delaware, C.A. No. 14-1525-LPS, November 23, 2016.

Expert Report of Mark A. Israel, In the Matter between *Darren Ewert and DENSO Corporation et al.*, In the Supreme Court of British Columbia, Vancouver Registry, No. S-135610, November 15, 2016.

Expert Reports of Mark A. Israel, In the Matter of the *United States of America et al. v. Anthem Inc. and Cigna Corp.*, In the United States District Court, District of Columbia, No. 16-cv-01493 (ABJ), Initial Report: October 7, 2016; Supplemental and Rebuttal Report: October 28,2016.

Verified Statements of Mark Israel and Jonathan Orszag, "Review of Commodity, Boxcar, and TOFC/COFC Exemptions," Surface Transportation Board, Docket No. EP 704 (Sub-No. 1), Initial Verified Statement: July 26, 2016; Reply Verified Statement: August 26, 2016.

Declarations of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, "Analysis of the Regressions and Other Data Relied Upon in the Business Data Services FNPRM And a Proposed Competitive Market Test," Federal Communications Commission, WC Docket Nos. 16-143, 15-247, 05-25, RM-10593, Second Declaration: June 28, 2016; Third Declaration: August 9, 2016.

Expert Declaration of Mark A. Israel, In the Matter of *Liberman Broadcasting, Inc. and LBI Media, Inc. v. Comcast Corporation and Comcast Cable Communications, LLC*, Federal Communications Commission, MB Docket No. 16-121, June 7, 2016.

Expert Report of Mark A. Israel, In the Matter of *La Crosse County, Individually, and on behalf of all others similarly situated v. Trinity Industries, INC. and Trinity Highway Products, LLC*, In the United States District Court, Western District of Wisconsin, Case No. 3:15-cv-00117-scl, May 27, 2016.

Expert Report of Mark A. Israel, In the Matter between *Darren Ewert and Nippon Yusen Kabushiki Kaisha et al.*, In the Supreme Court of British Columbia, Vancouver Registry, No. S-134895, May 20, 2016.

Declarations of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, In the Matter of *Special Access Rates for Price Cap Local Exchange Carriers*, Federal Communications Commission, WC Docket No. 05-25, Declaration: February 19, 2016; Supplemental Declaration: March 24, 2016; Second Supplemental Declaration: April 20, 2016.

Declaration of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, "Competitive Analysis of the FCC's Special Access Data Collection," Federal Communications Commission, WC Docket No. 05-25, January 26, 2016.

Declaration of Dr. Mark Israel, In the Matter of *iPic – Gold Class Entertainment, LLC et al., v. Regal Entertainment Group, AMC Entertainment Holdings, Inc. et al.*, In the District Court of Harris County, Texas, 234th Judicial District, No. 2015-68745, January 18, 2016.

Declaration of Dennis Carlton, Mark Israel, Allan Shampine & Hal Sider, "Investigation of Certain Price Cap Local Exchange Carrier Business Data Services Tariff Pricing Plans," Federal Communications Commission, WC Docket No. 15-247, January 7, 2016.

Declaration of Mark A. Israel, Attached to "Response of AT&T Mobility LLC to Notice of Apparent Liability for Forfeiture," Federal Communications Commission, File No. EB-IHD-14-00017504, July 17, 2015.

Reports in the Matter of *Federal Trade Commission et al. v. Sysco Corporation and USF Holding Corp.*, In the United States District Court for the District of Columbia, Civil Action No. 1:15-cv-00256 (APM), Declaration: February 18, 2015; Report: April 14, 2015; Rebuttal Report: April 21, 2015.

Declaration of Mark A. Israel, Bryan G. M. Keating, and David Weiskopf, "Economic Analysis of the Effect of the Comcast-TWC Transaction on Voice and Broadband Services in California," December 3, 2014.

Expert Report of Mark A. Israel, "Economic Analysis of the Effect of the Comcast-TWC Transaction on Broadband: Reply to Commenters," Federal Communications Commission, MB Docket No. 14-57, September 22, 2014.

Supplemental Declaration of Mark Israel and Allan Shampine, In the Matter of *Amendment of the Commission's Rules Related to Retransmission Consent, Appendix A to "Reply Comments of the National Association of Broadcasters*," Federal Communications Commission, MB Docket No. 10-71, July 24, 2014.

Declaration of Mark Israel and Allan Shampine, In the Matter of *Amendment of the Commission's Rules Related to Retransmission Consent, Appendix B to "Comments of the National Association of Broadcasters*," Federal Communications Commission, MB Docket No. 10-71, June 26, 2014.

Expert Report of Mark A. Israel, "Implications of the Comcast/Time Warner Cable Transaction for Broadband Competition," Federal Communications Commission, MB Docket No. 14-57, April 8, 2014.

Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Sprint's Proposed Weighted Spectrum Screen Defies Economic Logic and Is Inconsistent with Established Facts," Federal Communications Commission, WT Docket No. 12-269, March 14, 2014.

Reply Declaration of Mark A. Israel, "Competitive Effects and Consumer Benefits from the Proposed Acquisition of Leap Wireless by AT&T: A Reply Declaration," Federal Communications Commission, WT Docket No. 13-193, October 23, 2013.

Declaration of Mark A. Israel, "An Economic Analysis of Competitive Effects and Consumer Benefits from the Proposed Acquisition of Leap Wireless by AT&T," Federal Communications Commission, WT Docket No. 13-193, August 1, 2013.

Supplemental Reply Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Comments on Appropriate Spectrum Aggregation Policy with Application to the Upcoming 600 MHz Auction," Federal Communications Commission, WT Docket No. 12-269, June 13, 2013.

Reply Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Comment on the Submission of the U.S. Department of Justice Regarding Auction Participation Restrictions," Federal Communications Commission, WT Docket No. 12-269, June 13, 2013.

Reply Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Spectrum Aggregation Policy, Spectrum-Holdings-Based Bidding Credits, and Unlicensed Spectrum," Federal Communications Commission, GN Docket No. 12-268, March 12, 2013.

Declaration of Igal Hendel and Mark A. Israel, "Econometric Principles That Should Guide the Commission's Analysis of Competition for Special Access Service," Federal Communications Commission, WC Docket No. 05-25, February 11, 2013.

Declarations of Mark A. Israel and Michael L. Katz, "Economic Analysis of Public Policy Regarding Mobile Spectrum Holdings," Federal Communications Commission, WT Docket No. 12-269, Declaration: November 28, 2012; Reply Declaration: January 7, 2013.

Declaration of Mark Israel, "An Economic Assessment of the Prohibition on Exclusive Contracts for Satellite-Delivered, Cable-Affiliated Networks," Federal Communications Commission, MB Docket Nos. 12-68, 07-18, & 05-192, September 6, 2012.

Expert Report of Mark Israel, "Implications of the Verizon Wireless & SpectrumCo/Cox Commercial Agreements for Backhaul and Wi-Fi Services Competition," Federal Communications Commission, WT Docket No. 12-4, August 1, 2012.

Expert Report of Mark A. Israel, Michael L. Katz, and Allan L. Shampine, "Promoting Interoperability in the 700 MHz Commercial Spectrum," Federal Communications Commission, WT Docket No. 12-69, July 16, 2012.

Affidavits of Dr. Mark A. Israel in the Matter of *Bloomberg L.P. v. Comcast Cable Communications, LLC*, Federal Communications Commission, MB Docket No. 11-104, Declaration: June 21, 2012; Declaration: June 8, 2012; Supplemental Declaration: September 27, 2011; Declaration: July 27, 2011.

Expert Report of Robert Willig, Mark Israel, Bryan Keating, and Jonathan Orszag, "Response to Supplementary Comments of Hubert Horan," Docket DOT-OST-2009-1055, October 22, 2010.

Expert Report of Robert Willig, Mark Israel, Bryan Keating, and Jonathan Orszag, "Measuring Consumer Benefits from Antitrust Immunity for Delta Air Lines and Virgin Blue Carriers," Docket DOT-OST-2009-1055, October 13, 2010.

Expert Report of Mark Israel and Michael L. Katz, "Economic Analysis of the Proposed Comcast-NBCU-GE Transaction," Federal Communications Commission, MB Docket No. 10-56, July 20, 2010.

Expert Report of Mark Israel and Michael L. Katz, "The Comcast/NBCU Transaction and Online Video Distribution," Federal Communications Commission, MB Docket No. 10-56, May 4, 2010.

Expert Report of Mark Israel and Michael L. Katz, "Application of the Commission Staff Model of Vertical Foreclosure to the Proposed Comcast-NBCU Transaction," Federal Communications Commission, MB Docket No. 10-56, February 26, 2010.

Expert Report of Robert Willig, Mark Israel, and Bryan Keating, "Competitive Effects of Airline Antitrust Immunity: Response of Robert Willig, Mark Israel, and Bryan Keating" in Docket DOT-OST-2008-0252, January 11, 2010.

Affidavit of Dr. Mark A. Israel on Class Certification in the Matter of Puerto Rican Cabotage Antitrust Litigation, in the United States District Court for the District of Puerto Rico, MDL Docket No. 3:08-md-1960 (DRD), December 10, 2009.

Expert Report of Robert Willig, Mark Israel, and Bryan Keating, "Competitive Effects of Airline Antitrust Immunity," Docket DOT-OST-2008-0252, September 8, 2009.

Expert Report and Supplemental Expert Report of Dennis W. Carlton and Mark Israel in the Matter of *Toys "R" Us-Delaware, Inc., and Geoffrey Inc. v. Chase Bank USA N.A.*, in American Arbitration Association New York, New York, Commercial Arbitrations No. 13-148-02432-08, Expert Report: February 27, 2009; Supplemental Expert Report: March 20, 2009.

Expert Reports of James Levinsohn and Mark Israel, In the Matter of *2006 NPM Adjustment Proceeding pursuant to Master Settlement Agreement*, October 6, 2008; January 16, 2009; March 10, 2009.

**SELECTED OTHER EXPERT WORK IN REVIEW OF MERGERS/TRANSACTIONS**

*Successful acquisition of NWEA by Houghton Mifflin Harcourt, 2023*. Served as lead economic expert for Veritas Capital, owner of Houghton Mifflin Harcourt. Provided analyses demonstrating no significant competitive overlaps, no significant vertical concerns, and substantial pro-competitive benefits via integration of curriculum materials and assessment tools. Deal cleared by DOJ without a second request.

*Successful merger of Sony's Cruncyhroll and AT&T's Funimation anime streaming platforms. 2021.* Served as lead economic expert for AT&T. Made multiple presentations to DOJ, demonstrating lack of significant competitive interaction between the parties, including extremely limited consumer switching between them, as well as extensive competition with a broader marketplace including Netflix, Amazon, and others. DOJ closed the investigation allowing the merger to proceed with no conditions.

*Successful acquisition of Innovative Industries, Inc. by Ex Libris. 2020*. Served as lead economist in interactions with FTC. Demonstrated that the acquisition would not harm competition due to the *de minimis* extent of head-to-head competition between Ex Libris and Innovative and the recent decline of Innovative' s business. FTC closed investigation allowing acquisition to proceed with no conditions.

*Successful acquisition of TD Ameritrade by Charles Schwab. 2020*. Served as lead economist in interactions with DOJ. Presented analyses demonstrating broad market for investor dollars rather than narrow market for RIA Custodian Services. DOJ closed investigation allowing acquisition to proceed with no conditions.

*Successful acquisition of Reinhart Foodservice by Performance Food Group Company. 2019.* Served as lead economic expert on behalf of the parties in the FTC's investigation of the

merger. Presented data analyses showing ample competition and lack of harm to competition in any geographic market. FTC closed the investigation with no conditions.

*Successful acquisition of SGA's Food Group of companies by US Foods. 2019.* Served as lead economic expert on behalf of the parties in the FTC's investigation of the merger. Presented detailed economics and econometric analyses showing ample competition and lack of harm to competition in any geographic market. FTC cleared the merger subject to divestitures in three geographic markets in the Fall of 2019.

*Successful acquisition of Time Warner by AT&T Inc. 2017-2019.* Lead economist throughout the DOJ investigation. Then director of all economic work during trial, serving as the central connection point between all experts and counsel and directing development of all aspects of the economic case. Defendants ultimately prevailed in trial and the merger closed in June 2018.

*Successful acquisition of Keystone Foods by Tyson Foods, Inc. 2018.* Served as lead economic expert for U.S. jurisdiction. Presented economic analyses demonstrating that competition would remain strong post-merger. Ultimately, antitrust agencies in the U.S., China, Japan, and Korea cleared the transaction.

*Successful acquisition of NEX Group PLC by CME Group Inc. 2018.* Co-lead economic expert with Thomas Stemwedel. Presented several econometric analyses demonstrating that Treasury futures contracts and cash Treasury securities were economic complements rather than substitutes. Based heavily on these Compass Lexecon submissions, the DOJ and CMA closed their investigations without requiring any divestitures.

*Successful acquisition of VCA Inc. by Mars, Inc.* 2017. Co-lead economic expert with Mary Coleman. Made multiple presentations to FTC demonstrating ample competition in general, emergency, and specialty veterinary services, including econometric analyses showing lack of direct competitive impact of Mars and VCA on one another. Transaction was ultimately cleared subject to a small number of divestitures.

*Successful acquisition of Mobileye by Intel.* 2017. Served as lead economic expert for Intel. Assisted counsel in preparing FTC presentations and materials demonstrating lack of significant head-to-head competition and lack of valid vertical foreclosure theories. Investigation was closed without Second Request.

*FTC litigation against DraftKings, Inc. and FanDuel Inc. (Civil Action No. 17-cv-1195 (KBJ)).* 2017. Served as economic expert for FTC and prepared to serve as FTC's testifying expert against the merger, prior to the parties' abandonment of the deal. Developed economic and econometric evidence that the merging parties were closest substitutes and thus likely would have increased prices as a result of their proposed merger.

*Successful merger of ASE Group and SPIL.* 2017. Lead economic expert on behalf of ASE Group. Submitted reports and testified to the Taiwan Fair Trade Commission, which ultimately cleared the transaction, then made multiple presentations to U.S. FTC, which also cleared the transaction. Economic analyses focused on implications of profit margins for market definition and competitive effects, ultimately demonstrating that the transaction was unlikely to cause significant harm to competition.

*Successful acquisition of Alarm.com of two business units (Connect and Piper) from iControl Networks.* 2017. Led team that demonstrated substantial and growing competition in home security and connected home marketplace and thus lack of competitive harm from acquisition. Work focused on importance of downstream market definition as well as empirical evidence of impact of competition on Alarm.com pricing and profitability.

*Successful acquisition of Samsung Electronics, Ltd.'s printer business by HP Inc.* 2016. Led team in evaluating the competitive effects of the acquisition, including assessing shares and competitive effects in overlap areas. Notably, the transaction gained regulatory approval in the U.S. during the initial review period without issuing a Second Request.

*Successful acquisition of Sun Products Corp. by Henkel AG.* 2016. Led team demonstrating lack of competitive impact despite overlaps in laundry detergent and related products.

*Successful acquisition of Starwood Hotels & Resorts by Marriott International*. 2016. Led team that performed detailed analysis of competitive conditions, extensive econometric analysis of pricing, and full review of Marriott's internal pricing models to demonstrate that Starwood and Marriott were not close competitors, combined ownership of the brands would not lead to upward pricing pressure, and competition would remain robust post-merger.

*Successful acquisition of PR Newswire by GTCR.* 2016. Lead economic expert for GTCR. Made presentations to DOJ showing lack of competitive harm from the transaction, based on detailed analysis of win/loss data, including calculations showing no possible upward pricing pressure (UPP) concerns regardless of the level of margins.

*Successful acquisition of Schurz Communications' Broadcast Stations by Gray Television*. 2015. Lead economic expert for Gray. Made presentations to DOJ demonstrating output expanding effects of proposed transaction in light of the scale economies in television production and advertising and the small size of the DMAs affected by the transaction.

*Successful acquisition of the Communications Business of Danaher Corporation by NetScout Systems*. 2015. Lead economic expert for NetScout. Made presentations to DOJ describing proper economic framework for analysis of competition and potential merger harms, and demonstrated that the presence of multiple viable competitors and numerous other credible threats to be used by powerful buyers in a dynamic industry made theories of anti-competitive harm from the merger implausible.

*Successful acquisition of Windmill Distribution Co. by Manhattan Beer Distributors.* 2015. Lead economic expert for Manhattan Beer Distributors. Submitted White Paper to DOJ demonstrating, based on margin data, that the merger would be highly unlikely to lead to anti-competitive effects. Transaction was granted early termination from the Hart Scott Rodino process by the DOJ.

*Proposed acquisition of Time Warner Cable by Comcast Corporation*. 2014-2015. Served as lead economic expert on broadband issues on behalf of Comcast Corporation. Submitted multiple Declarations and made multiple presentations to DOJ and FCC, explaining lack of horizontal, bargaining, or vertical/foreclosure concerns with regard to broadband competition as a result of the transaction.

*Successful acquisition of Leap Wireless by AT&T.* 2014. Lead economic expert for AT&T. Submitted multiple Declarations to FCC and made presentation to DOJ, demonstrating the transaction would generate substantial consumer benefits, while generating at most minimal upward pricing pressure in a properly defined mobile wireless services market and no issues related to spectrum concentration or other competitive concerns.

*Successful merger of American Airline and US Airways.* 2013. Lead consulting expert, managing Compass Lexecon team of over 25 economists supporting multiple experts. Made multiple presentations to DOJ, worked on expert reports in litigation, and assisted counsel with the analysis leading to settlement of litigation, permitting transaction to close.

*Successful merger of T-Mobile USA and MetroPCS*. 2013. Lead economic expert for T-Mobile USA. Conducted economic analyses of competitive effects and consumer benefits from the transaction, as well as consumer benefits from reduced costs and increased network quality. Presented analyses to both DOJ and FCC.

*FTC investigation of acquisition of Dollar Thrifty Automotive Group by* Hertz. 2012. Served as a lead economic expert for FTC and prepared to serve as FTC's testifying expert against the merger, prior to case settlement. Conducted empirical analyses based on previous rental car mergers demonstrating likely price increases from the transaction.

*Decision by Federal Communications Commission not to extend the ban on exclusive contracts for satellite-delivered, cable-affiliated networks*. 2012. Lead economic expert for National Cable and Telecommunications Association. Submitted economic analysis demonstrating that the ban on exclusive distribution of satellite-delivered, cable affiliated networks is no longer warranted given increased marketplace competition. FCC made decision to allow the ban to sunset.

*Successful sale of wireless spectrum by SpectrumCo and Cox ("Cable Companies") to Verizon Wireless and successful completion of related commercial agreements*. 2012. On behalf of the Cable Companies, performed economic analyses demonstrating lack of competitive harm from the transaction on markets for backhaul and Wi-Fi services. Presented analyses to FCC.

*Successful acquisition by LIN Media of broadcast television stations from NVTV*. 2012. Lead economic expert for LIN Media. Prepared economic analysis demonstrating lack of competitive concern over potential issues related to SSA and JSA Arrangements.

*Proposed acquisition of T-Mobile USA by AT&T*. 2011. Served as one of the lead economists, initially for T-Mobile (along with Michael Katz) and ultimately for both parties (along with Michael Katz and Dennis Carlton). Made multiple presentations to DOJ and FCC. Appeared in FCC Workshop, ex parte meeting.

S*uccessful application for antitrust immunity by Delta and Virgin Blue*. 2010. Together with Robert Willig, Bryan Keating, and Jon Orszag, prepared economic analyses demonstrating substantial net consumer benefits from antitrust immunity. Submitted results in expert reports to Department of Transportation.

*Successful joint venture between Comcast and NBC Universal (and ultimate full acquisition of NBC Universal by Comcast)*. 2010. Served as one of the lead economists (along with Michael Katz) on behalf of the merging parties. Wrote multiple reports submitted to FCC

(with Michael Katz) demonstrating lack of significant competitive concerns from the transaction. Made multiple presentations to DOJ and FCC. Appeared in FCC Workshop of economists, ex parte meeting.

*Successful application for antitrust immunity for oneworld alliance and associated joint venture of American Airlines, British Airways, and Iberia Airlines*. 2009-2010. Together with Robert Willig and Bryan Keating, prepared economic analyses demonstrating substantial net consumer benefits associated with antitrust immunity for the joint venture. Submitted results in expert reports to Department of Transportation.

*Successful acquisition by PepsiCo of bottlers, PBG and PAS*. 2009. Performed econometric and simulation analyses demonstrating pro-competitive effect of merger on PepsiCo's own brands, other brands distributed by PBG and PAS, and overall marketplace. Presented results to FTC (together with Dennis Carlton).

*Successful merger of Delta Airlines and Northwest Airlines*. 2008. In support of Dennis Carlton, developed empirical and theoretical analyses to demonstrate merger's pro-competitive nature. Work focused on (ultimately settled) private litigation opposing the merger.

*Successful acquisition of Harcourt Education by Houghton Mifflin*. 2007. Along with Daniel Rubinfeld and Frederick Flyer, developed econometric analyses demonstrating lack of competitive harm from proposed merger. Presented results to DOJ.

*Successful acquisition of Chicago Board of Trade by Chicago Mercantile Exchange*. 2007. Along with Robert Willig and Hal Sider, developed and presented multiple empirical analyses demonstrating lack of competitive harm from merger. Submitted multiple white papers and made multiple presentations to DOJ.

**SELECTED OTHER EXPERT/CONSULTING WORK**

Led team supporting Dennis Carlton's testimony in Toshiba/Hannstar TFT-LCD Antitrust litigation vs. Plaintiff Best Buy, 2013.

Led team supporting Dennis Carlton's testimony in Toshiba's TFT-LCD Class Action Antitrust litigation. Named Litigation Matter of the Year for 2012 by *Global Competition Review*, 2012.

As economic expert for US Airways, developed econometric analysis of air traffic at major US airports, presented to Philadelphia Airport management team, 2011.

Prepared analysis of the competitive impact of low-cost-carrier competition in Washington, D.C. and New York airports. Filed with DOT, 2011.

ON BEHALF OF MAJOR PHARMACEUTICAL FIRM, DEVELOPED ECONOMETRIC MODEL TO FORECAST PHARMACEUTICAL EXPENDITURES, 2009.

Developed econometric model to measure of the importance of network effects in credit cards in the context of measuring damages incurred by a major credit card issuer, 2007-2008.

## OTHER CONFIDENTIAL CONSULTING WORK IN THE FOLLOWING INDUSTRIES

Automobiles and Components

Consumer Durables

Consumer Services

Financial Services

Energy

Food, Beverage, and Tobacco

Healthcare Equipment and Services

Media

Pharmaceuticals, Biotechnology, and Life Sciences

Retail

Semiconductors and Semiconductor Equipment

Software and Related Services

Technology: Hardware and Equipment

Telecommunication Services

Transportation

Utilities

## PUBLICATIONS

"RPM and Vertical Integration with Upstream Competition and Noncontractible Efforts," (with Michele Bisceglia, Salvatore Piccolo, and Paolo Ramezzana), available at *https://ssrn.com/abstract=4913199;* Submitted to the *Journal of Industrial Economics*, August 2024.

"Vertical Mergers with Bilateral Contracting and Upstream and Downstream Investment," (with Daniel P. O'Brien), available at *https://ssrn.com/abstract=3886048*, July 2021; Revise and Resubmit at the *Journal of Economics & Management Strategy*, July 2024.

"Dynamic Lerner Condition and Horizontal Merger Assessment," (with Rodrigo Montes, Loren Poulsen, and Jason Wu), available at *https://ssrn.com/abstract=4817343*, May 2024.

"Lessons from Foreclosure Parables: The Need to Tether Vertical Merger Analysis," (with Daniel P. O'Brien), available at *https://ssrn.com/abstract=4726861*, January 2024.

"Guidelines Lacking Guidance: Improving the FTC/DOJ Draft Merger Guidelines," (with Daniel P. O'Brien, Jonathan Orszag, Jeremy Sandford, Loren Smith, and Nathan Wilson), available at *https://papers.ssrn.com/abstract=4575390*, September 2023.

"Evaluating a Theory of Harm in a Vertical Merger: AT&T/Time Warner," (with Dennis W. Carlton, Georgi V. Giozov, and Allan L. Shampine), Chapter 5 in *Antitrust Economics at a Time of Upheaval: Recent Competition Policy Cases on Two Continents*, John Kwoka, Jr., Tommaso M. Valletti, and Lawrence J. White, eds., August 2023.

"Cheap Exclusion in Markets with Multiple Complements," (with Erica Benton and Daniel P. O'Brien), forthcoming in the *International Journal of Industrial Organization*, available at *https://ssrn.com/abstract=4328818*, June 2023.

"A Retrospective Analysis of the AT&T/Time Warner Merger" (with Dennis W. Carlton, Georgi V. Giozov, and Allan L. Shampine), Volume 65, Number S2, in the *Journal of Law and Economics*, November 2022.

"New Merger Guidelines Should Keep the Consumer Welfare Standard" (with Jonathan Orszag and Jeremy Sandford), *CPI Antitrust Chronicle*, November 2022.

"The Economics of the LCD Cartel: Organization, Incentives, and Practical Challenges," (with Dennis W. Carlton, Ian MacSwain, and Allan Shampine), available at *https://ssrn.com/abstract=4190535*, August 2022, and forthcoming in *Cartels Diagnosed: New Insights on Collusion*.

"International Broadband Price Comparisons Tell Us Little about Competition and Do Not Justify Broadband Regulation," working paper (with Michael Katz and Bryan Keating), commissioned by NCTA – The Internet & Television Association, May 11, 2021.

"Effects of the 2010 Horizontal Merger Guidelines on Merger Review: Based on Ten Years of Practical Experience," (with Dennis W. Carlton), Volume 58, Issue 2, in the *Review of Industrial Organization*, November 2020.

"An Evaluation of the Impact of the 2010 Horizontal Merger Guidelines," (with Dennis W. Carlton), available at *https://ssrn.com/abstract=3547653*, March 2020.

"Lessons from *AT&T/Time Warner,*" (with Dennis W. Carlton and Allan L. Shampine), *Competition Policy International*, July 2019.

"Are You Pushing Too Hard? Lower Negotiated Input Prices as a Merger Efficiency," (with Thomas A. Stemwedel and Ka Hei Tse), Volume 82, Issue 2, Pages 623-642, in the *Antitrust Law Journal*, April 2019.

"Vertical Integration in Multichannel Television Markets: Revisiting Regional Sports Networks Using Updated Data," (with Georgi Giozov, Nauman Ilias, and Allan Shampine), Volume 4:1 in *The Criterion Journal on Innovation*, 2019.

"Are Legacy Airline Mergers Pro- or Anti-Competitive? Evidence from Recent U.S. Airline Mergers," (with Dennis Carlton, Ian MacSwain, and Eugene Orlov), Volume 62, Pages 58-95, in the *International Journal of Industrial Organization*, January 2018.

"Competitive Effects of International Airline Cooperation," (with Robert J. Calzaretta and Yair Eilat), Volume 13, Issue 3, Pages 501-548, in the *Journal of Competition Law & Economics*, September 2017.

"Econometrics and Regression Analysis," (with Chris Cavanagh, Paul Denis, and Bryan Keating), Chapter 6 in the *American Bar Association's Proving Antitrust Damages: Legal and Economic Issues, Third Edition*, 2017.

"Do Premiums Increase After Health Insurance Mergers? – A Reassessment of Guardado et al.'s Findings," (with Robert C. Bourke, Ben Wagner, and David A. Weiskopf), available at *https://ssrn.com/abstract=2933062*, March 2017.

"Complementarity without Superadditivity," (with Steven Berry, Philip Haile, and Michael Katz), Volume 151, Pages 28-30, in *Economics Letters*, December 2016.

"Antitrust in a Mobile World," (with Yonatan Even, Jonathan M. Jacobson, Scott Martin, and Dr. Helen Weeds), Chapter 17 in *International Antitrust Law & Policy: Fordham Competition Law 2015*, James Keyte, ed., 2016.

"Buyer Power in Merger Review," (with Dennis W. Carlton and Mary Coleman), Chapter 22 in *The Oxford Handbook of International Antitrust Economics*, Volume 1, Roger D. Blair and D. Daniel Sokol, eds., 2015.

"Airline Network Effects and Consumer Welfare," (with Bryan Keating, Dan Rubinfeld, and Robert Willig), *Review of Network Economics*, available at *https://ssrn.com/abstract=2473243*, November 2013.

"The Evolution of Internet Interconnection from Hierarchy to 'Mesh': Implications for Government Regulation," (with Stanley M. Besen), Volume 25 in *Information Economics and Policy*, July 2013.

"The Delta-Northwest Merger: Consumer Benefits from Airline Network Effects (2008)," (with Bryan Keating, Daniel L. Rubinfeld, and Robert D. Willig), *The Antitrust Revolution*, Sixth Edition, John E. Kwoka, Jr. and Lawrence J. White, eds., July 2013.

"Proper Treatment of Buyer Power in Merger Review," (with Dennis W. Carlton), *Review of Industrial Organization*, July 2011.

"Response to Gopal Das Varma's Market Definition, Upward Pricing Pressure, and the Role of the Courts: A Response to Carlton and Israel," (with Dennis W. Carlton), *The Antitrust Source*, December 2010.

"Will the New Guidelines Clarify or Obscure Antitrust Policy?" (with Dennis W. Carlton), *The Antitrust Source,* October 2010.

"Should Competition Policy Prohibit Price Discrimination?" (with Dennis W. Carlton), *Global Competition Review*, 2009.

"The Empirical Effects of Collegiate Athletics: An Update Based on 2004-2007 Data," (with Jonathan Orszag), Paper commissioned by National Collegiate Athletic Association, available *at http://www.epi.soe.vt.edu/perspectives/policy_news/pdf/NCAASpending.pdf*, February 2009.

"Services as Experience Goods: An Empirical Examination of Consumer Learning in Automobile Insurance," *The American Economic Review*, December 2005.

"Tenure Dependence in Consumer-Firm Relationships: An Empirical Analysis of Consumer Departures from Automobile Insurance Firms," *The Rand Journal of Economics*, Spring 2005.

"The Impact of Youth Characteristics and Experiences on Transitions Out of Poverty," (with Michael Seeborg), *Journal of Socio-Economics*, 1998.

"Racial Differences in Adult Labor Force Transition Trends," (with Michael Seeborg), *Journal of Economics*, 1991.

**SELECTED RECENT PRESENTATIONS**

LexMundi 2024 Cross-Border Transactions Global Seminar, "U.S. Merger Control Fireside Chat," Speaker, February 2024.

American Bar Association Section of Antitrust Law, "Nuts & Bolts of Presenting Economic Evidence to the Agencies: Common Pitfalls and Best Practices, Panelist, October 2019.

Dechert LLP, 2019 Annual Antitrust Spring Seminar, Keynote Speaker, March 2019.

Concurrences Review and The George Washington University Law School, 6th Bill Kovacic Antitrust Salon: Where is Antitrust Policy Going?, "A Judge's Eye View on Antitrust: Mergers, Cartels, Remedies…," Panelist, September 2018.

Fordham Competition Law Institute, 45th Annual Conference on International Antitrust Law and Policy, "Merger Remedies," Panelist, September 2018.

Georgetown Center for Business and Public Policy, "Airline Competition Conference," Panelist, July 2017.

J.P. Morgan Special Situations Investor Forum, "The Antitrust Merger Review Process," Panelist, March 2017.

American Bar Association Section of Antitrust Law, "Economic Issues Raised In The Comcast – Time Warner Cable Merger," Panelist, February 2016.

Fordham Competition Law Institute, 42nd Annual Conference on International Antitrust Law and Policy, "Antitrust in a Mobile World," Panelist, October 2015.

American Bar Association Section of Antitrust Law, "Merger Practice Workshop," Faculty Member, October 2015.

Searle Center Conference on Antitrust Economics and Competition Policy, Panel on Recent Transactions in the Telecom Industry, Panelist, September 2015.

National Bureau of Economic Research, Summer Institute 2015, Industrial Organization Meetings, "Panel Discussion of the Comcast-Time Warner Merger," Panelist, July 2015.

Federal Communications Bar Association, "How the Antitrust Agencies and the FCC are Likely to Analyze Vertical Mergers," Panelist, November 2014.

The Coca Cola Company Global Antitrust Forum, "Round Table Discussion on Use of Economics and Economists," Panel Chair, November 2014.

Compass Lexecon Competition Policy Forum, Lake Como Italy, "Consolidation of the Telecoms Industry in the EU and the U.S.," Panelist, October 2014.

The IATA Legal Symposium 2014, Aviation Law: Upfront and Center, "Merger Analysis – A sudden shift in approach by DOJ in the American Airlines and US Airways merger," Panelist, February 2014.

Georgetown Law 7th Annual Global Antitrust Enforcement Symposium, "Merger Enforcement and Policy," Panelist, September 2013.

American Bar Association Section of Antitrust Law, "Airline Mergers: First Class Results or Middle-Seat Misery?" Panelist, May 2013.

American Bar Association Section of Antitrust Law, "Go Low or Go Home! Monopsony a Problem?" Panelist, March 2012.

Federal Communications Bar Association Transactional Committee CLE Seminar, "The FCC's Approach to Analyzing Vertical Mergers," Panelist, October 2011.

The Technology Policy Institute Aspen Forum, "Watching the Future: The Economic Implications of Online Video," Panelist, August 2011.

American Bar Association Forum on Air & Space Law, 2011 Update Conference, "Antitrust Issues: What's on the Horizon for the Industry," Panelist, February 2011.

American Bar Association Section of Antitrust Law, "Antitrust in the Airline Industry," Panelist, September 2010.

## GRANTS AND HONORS

Searle Fund for Policy Research Grant, 2004-2006, for "An Empirical Examination of Asymmetric Information in Insurance Markets."

Kellogg School of Management Chairs' Core Course Teaching Award, 2003 & 2005.

Bradley Dissertation Fellowship, Stanford University, 1999-2000.

Stanford University, Outstanding Second Year Paper Prize, 1997.

## ADVISORY, EDITORIAL, AND TRUSTEE BOARDS

Global Competition Review, Editorial Board, Member

Member of Steering Committee for Cambridge Forum on U.S. Antitrust Regulation

Illinois Wesleyan University, Board of Trustees, Trustee

Kenyon College, Board of Trustees, Trustee

**ATTACHMENT B: MATERIALS RELIED UPON**

## CPUC and FCC Filings


Rulemaking on the Commission's Own Motion into Universal Service and to Comply with the Mandates of Assembly Bill 3643, 1996 Cal. PUC LEXIS 1046; 68 CPUC 2d 524, October 25, 1996

CPUC, Decision Dismissing with Prejudice the Application of AT&T California to Withdraw as a Carrier of Last Resort, Application 23-03-003, June 25, 2024

CPUC, Order Instituting Rulemaking Proceeding to Consider Changes to the Commission's Carrier of Last Resort Rules, Rulemaking 24-06-012, June 28, 2024

CPUC General Order 133-D, available at https://www.cpuc.ca.gov/-/media/cpuc-website/files/uploadedfiles/cpuc_public_website/content/proceedings/proceedings_rules/go133d.pdf

Federal Communications Commission, FCC 24-52, In the Matter of Safeguarding and Securing the Open Internet, Restoring Internet Freedom, Declaratory Ruling, Order, Report and Order, and Order on Reconsideration, adopted April 25, 2024

FCC, In the Matter of Metronet Holdings, LLC, Assignor and Transferor, MetroNet Systems Holdings, LLC, Assignee and Transferee, Joint Application for Consent to (1) Assign International Authority and (2) Transfer Control of International and Domestic Authority Pursuant to Section 214 of the Communications Act of 1934, as Amended, August 8, 2024, available at https://www.fcc.gov/ecfs/document/1080843338601/1

FCC 2022 Communications Marketplace Report, FCC 22-103, December 30, 2022

FCC 2018 Broadband Deployment Report, available at https://docs.fcc.gov/public/attachments/FCC-18-10A1.pdf

FCC Local Telephone Competition: Status as of December 31, 2005, available at https://docs.fcc.gov/public/attachments/DOC-266595A1.pdf

FCC Voice Telephone Services: Status as of June 30, 2022, available at https://www.fcc.gov/voice-telephone-services-report


## Industry Reports


Ericsson White Paper, "Voice and Communication Services in 4G and 5G Networks," GFMC-284 23-3163 Uen Rev D, July 2022, available at https://www.ericsson.com/en/reports-and-papers/white-papers/voice-and-communication-services-in-4g-and-5g-networks

Heynen, Jeff, "Telcos' Tipping Point: 10G Fiber and Software-Defined Access," Dell'Oro Group, December 11, 2020, available at https://www.delloro.com/knowledge-center/white-papers/telcos-tipping-point-10g-fiber-and-software-defined-access-2/

National Health Interview Survey Early Release Program, 2022, available at https://www.cdc.gov/nchs/data/nhis/earlyrelease/Wireless_state_202406.pdf

National Health Interview Survey Early Release Program, July-December 2023, available at https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless202406.pdf

National Telecommunications and Information Administration (NTIA), U.S. Department of Commerce, Notice of Funding Opportunity, NTIA-BEAD-2022, May 3, 2022, available at https://broadbandusa.ntia.doc.gov/sites/default/files/2022-05/BEAD%20NOFO.pdf

Report of the Committee on Commerce, Science, and Transportation, March 30, 1995

**Academic Literature**

Almeida, Fernando, and José Cruz (2014), "Mitigation of Security Concerns of VoIP in the Corporate Environment," *Organizational, Legal, and Technological Dimensions of Information System Administration*, (Portela, Irene Maria, and Fernando Almeida, Eds.), IGI Global

Guffey, Mary Ellen and Dana Loewy (2014), *Essentials of Business Communication,* 10th Ed., Cengage Learning

Kumar, Anuj (2011), "Security and Risk Challenges of Voice over IP Telephony." *International Journal of Electronics Engineering*, 3(1):85-87

Lichtenberg, Sherry, "Carrier of Last Resort: Anachronism or Necessity?" *National Regulatory Research Institute*, Report No. 16-06, July 2016, available at https://pubs.naruc.org/pub/FA85B978-00A3-862C-5E8D-9E10816FA7DB

Zhao, Yongli, Yuqiao Wang, Wei Wang & Xiaosong Yu, "Software-Defined Optical Networks (SDON): Principles and Applications," *Optical Fiber and Wireless Communications*, June 21, 2017, available at https://www.intechopen.com/chapters/54939

**News Articles and Press Releases**

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Baumgartner, Jeff, "Verizon has 150,000 fixed wireless access subs," Light Reading, October 20, 2021, available at https://www.lightreading.com/5g/verizon-has-150-000-fixed-wireless-access-subs

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**Data Sources**

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FCC Study Areas data, updated September 5, 2024, available at https://www.fcc.gov/economics-analytics/industry-analysis-division/study-area-boundary-data

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FCC Technology Codes Used in Fixed Broadband Deployment Data, Updated December 7, 2015, available at https://www.fcc.gov/general/technology-codes-used-fixed-broadband-deployment-data

Historical Households Tables, November 2023 (available at https://www.census.gov/data/tables/time-series/demo/families/households.html

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