Before the
CALIFORNIA PUBLIC UTILITIES COMMISSION

Order Instituting Investigation into the State of Competition Among Telecommunications Providers in California, and to Consider and Resolve Questions raised in the Limited Rehearing of Decision 08-09-042.	Investigation 15-11-007

Direct Testimony

of

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on behalf of the

Office of Ratepayer Advocates
of the
California Public Utilities Commission

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DIRECT TESTIMONY OF LEE L. SELWYN

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1 Statement of Qualifications – Dr. Lee L. Selwyn

INTRODUCTION AND SUMMARY

Qualifications, background and experience

1. My name is Lee L. Selwyn. I am President of Economics and Technology, Inc. ("ETI"), One Washington Mall, 15th Floor, Boston, Massachusetts 02108. ETI is a research and consulting firm specializing in telecommunications economics, regulation and public policy. My Statement of Qualifications is annexed hereto as Attachment 1 and is made a part hereof.

2. I hold a Ph.D. degree in Management from the Alfred P. Sloan School of Management, Massachusetts Institute of Technology. I also hold a Master of Science degree in Industrial Management from MIT and a Bachelor of Arts degree with Honors in Economics from Queens College of the City University of New York. In 1970, I was awarded a Post-Doctoral Research Grant in Public Utility Economics under a program sponsored by the American Telephone and Telegraph Company, to conduct research on the economic effects of telephone rate structures upon the computer time-sharing industry. This work was conducted at Harvard University's Program on Technology and Society, where I was appointed a Research Associate. I was also a member of the faculty at the College of Business Administration at Boston University from 1968 through 1973, where I taught courses in economics, finance and management information systems. I founded my firm, Economics and Technology, Inc., in January 1972, and have served as its President continuously since that date.

3. I have been actively and continuously involved in the fields of telecommunications economics, policy and regulation since the late 1960s. I have provided expert testimony and

analysis on telecommunications economics, technology, rate design, service cost analysis, market structure, form of regulation, and numerous other telecommunications issues before more than forty state public utility commissions, the Federal Communications Commission, the United States Congress, and regulatory bodies in a number of foreign countries, on behalf of commercial organizations, non-profit institutions, and local, state and federal government authorities. Attachment 1 to this Declaration provides a complete record of my publications and prior expert testimony and appearances before regulatory agencies and courts.

4. I have submitted expert reports and testimony in numerous telecommunications regulatory proceedings before the Federal Communications Commission ("FCC") and state public utilities commissions in approximately forty states dating back to the late 1960s, dealing with a broad range of ratesetting and policy matters, including switched and special access charges, price cap regulation, Sec. 251/252 interconnection and unbundling requirements, total service resale and wholesale pricing, universal service, broadband and related Internet access issues, intercarrier compensation, spectrum allocation, handset interoperability, CMRS early termination fees, and many others. I have provided expert testimony in numerous California PUC proceedings dating back to the mid-1970s. A complete listing of these appearances is included in Attachment 1 hereto.

5. I have had extensive experience with the analysis of consumer and competitive impacts of mergers and spin-offs involving large telecommunications companies, including a number of matters before the California PUC on behalf of the Office of Ratepayer Advocates or Division of

Ratepayer Advocates – A. 96-04-038, SBC/Pacific Bell merger (1996-7); A. 98-12-005, Bell Atlantic/GTE merger (1998); A. 05-02-027, SBC/AT&T merger (2005); A. 05-04-020, Verizon/MCI merger (2005), the Comcast/TWC merger, A.14-04-013/A.14-06-012, and most recently, the transfer of control of Verizon's ILEC operations in California, Texas and Florida to Frontier Communications, A.15-03-005. In 1993, I submitted testimony on behalf of DRA in I.93-02-028, the "spin-off" by Pacific Telesis Group of its cellular and other wireless subsidiaries. I also submitted expert testimony on similar merger-related issues before the FCC and in several other state PUC matters, including Maine PUC Docket No. 96-388, Bell Atlantic/NYNEX merger (1996), on behalf of the Maine Office of Public Advocate; Connecticut DPUC Docket No. 98-02-20, SBC/SNET merger (1998), on behalf of the Connecticut Office of Consumer Counsel; United States District Court for the District of Columbia, Civil Action No. 1:05CV02102 (EGS), SBC/AT&T merger; Verizon/MCI merger, Civil Action No. 1:05CV02103 (EGS) (1996), on behalf of the National Association of State Utility Consumer Advocates (NASUCA); Illinois Commerce Commission Docket No. 09-0268, Verizon sale of its Illinois exchanges to Frontier Communications, Inc. (2009), on behalf of the People of the State of Illinois and the Citizens Utility Board; and FCC WT Docket No. 11-65, AT&T/T-Mobile merger (2011), on behalf of the Ad Hoc Telecommunications Users Committee.

6. I have published several articles dealing specifically with Net Neutrality and related Open Internet issues, including "Revisiting the Regulatory Status of Broadband Internet Access: A Policy Framework for Net Neutrality and an Open Competitive Internet," (with Helen E. Golding), *Federal Communications Law Journal*, Vol. 63 Num. 1, December 2010. I have also

contributed chapters to two recent American Bar Association publications, "Network Industry Markets: Telecommunications" (with Helen E. Golding), Chapter X in *Market Definition in Antitrust: Theory and Case Studies*, ABA Section of Antitrust Law (2012), at pp. 411-436, and "Economic Underpinnings: The Economics of Communications Networks, Market Power, and Vertical Foreclosure Theories" (with Helen E. Golding et al), Chapter I in *Telecom Antitrust Handbook, Second Edition*, ABA Section of Antitrust Law (2013), at pp. 1-61.

7. In addition to my various professional activities, I am an elected Town Meeting Member in the Town of Brookline, Massachusetts, and serve on the Town's Advisory and Finance Committee and on the Town's Audit Committee, and have recently served on a special Tax Override Study Committee.

Assignment

8. I have been asked by the Office of Ratepayer Advocates ("ORA") of the California Public Utilities Commission ("CPUC" or "Commission") to address, in this opening testimony, Questions 20 and 21, and an initial response to Question 22 in the November 5, 2015 Order Instituting Investigation ("OII") in this matter:

> 20. Identify the metrics and sources of data that you believe would be most useful and useable by the Commission to measure competition in both the retail and wholesale markets, whether identified in Appendix A or found elsewhere.
>
> 21. How should the Commission determine whether the prices of telephone services are just and reasonable? Parties should identify the specific factors or metrics they propose the Commission use to determine whether prices are just and reasonable.

22. What information does the Commission need to collect going forward, in order to timely monitor whether (a) the telecommunications market is operating efficiently, and (b) the rates for telephone services are just and reasonable? How should the Commission collect and use that information, and report on it to the Legislature and ratepayers? Please provide specific data and analysis to support your conclusion.

I also anticipate submitting additional testimony on behalf of ORA in subsequent phases of this proceeding.

A NEW TELECOMMUNICATIONS POLICY FRAMEWORK

Introduction and Background

9. In adopting its Uniform Regulatory Framework ("URF") in 2006, the Commission, in the current OII, explained that it had "sought to foster an effectively competitive marketplace, one that would create good outcomes for consumers in terms of price, choice, coverage, quality and reliability" with the anticipation that "competition among telecommunications carriers would drive increased innovation and improved customer service, while at the same time keeping prices just and reasonable."[1] Having determined that competition in California's telecommunications markets had developed to the point where the need for continued rate regulation had abated, the Commission de-tariffed most retail telecommunications services, but did not reduce or rescind its regulatory authority with respect to these de-tariffed services. Indeed, the Commission expressly recognized "an ongoing need and statutory mandate for vigilant Commission oversight of the competitive marketplace to ensure that the market serves consumers well."[2]

10. The decade since the adoption of URF has seen enormous changes in the telecommunications market both in California and nationwide. Many claim that voice telephone service, long the central focus of telecommunications regulation, has become largely competitive while also

1. OII, at 2.

2. *Id.*, citing D.06-08-030, Slip Op. at 156 ("we will remain vigilant in monitoring the voice communications marketplace").

diminishing in importance as the primary means of social and commercial telecommunications. However, the actual extent to which this has happened can only be determined on the basis of actual data, including in particular a demonstration that the pricing of voice services is consistent with a competitive marketplace. The ability of many incumbent local exchange carriers ("ILECs") to persistently raise prices for their legacy voice services despite putative competition from various intermodal wireless and VoIP offerings suggests that for at least some consumers, realistic alternatives to traditional wireline voice telephony may still be elusive. For many consumers, wireline voice service has been supplanted by wireless voice and wireline broadband. At the same time, the provision of residential broadband Internet access at speeds capable of supporting the full range of applications being demanded by consumers is becoming less competitive. Evidence presented by ORA in three recent "change of control" proceedings has confirmed that the vast majority of California households have only one source of broadband access offering speeds that the FCC currently considers satisfy the minimum definition of "advanced telecommunications service" – 25 Mbps download and 3 Mbps upload.[3] Thus, while the Commission's expectation in URF – that competition will be sufficient to protect consumers with respect to *voice* services – still requires verification, this has certainly not been the case with broadband.

3. *In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, GN Docket No. 14-126, *2015 Broadband Progress Report and Notice of Inquiry of Immediate Action to Accelerate Deployment*, FCC 15-10 (rel. February 4, 2015), at para. 3.

11. Underlying the various deregulatory initiatives in URF was the *assumption* that the level of competition for the legacy incumbent provider's services had matured to the point where marketplace forces could be reliably counted upon to replace regulation in constraining the incumbent's pricing and conduct. Much of the debate that has arisen over the past several decades has been directed at determining when the level of competition is sufficient to supplant regulation in protecting consumers and in achieving a "competitive outcome." Indeed, Information Request no. 20 in this OII goes directly to this concern – "[i]dentify the metrics and sources of data ... to measure competition in both the retail and wholesale [telecommunications] markets." While some consider the matter fully settled, the increasing complexity and concentration across broad telecom industry sectors presents new challenges that need to be carefully examined and resolved.

12. In the testimony that follows, I respond to OII Information Requests 20 and 21 by proposing an analytical framework by which this might be accomplished. And, in fact, Information Request no. 21 – "[h]ow should the Commission determine whether the prices of telephone services are just and reasonable?" – is itself a key element of that framework. For Information Request 22, the Commission can apply the framework discussed in this testimony to monitor whether the telecommunications market is operating efficiently and if rates for services are just and reasonable. Additional analysis or recommendations on what information the Commission should collect going forward to timely conduct such monitoring will be addressed during Supplemental Responses in June 1, 2016 once all data has been analyzed. Ultimately, the Commission will want to hear and consider a range of policy options whose dual objectives are

to maintain the dynamic efficiencies of a robustly competitive market *in those sectors in which robust multi-provider competition is economically feasible* while at the same time protecting consumers and competition by assuring *that, in those sectors in which competition is not economically feasible,* essential services are available at cost-based prices both at retail to end-user consumers as well as at wholesale for use as inputs to services that are capable of supporting competition. Consideration of such policy options is set to occur in a later phase of this proceeding, and I expect to submit additional testimony at that time.

Assessing the extent and effectiveness of competition – the Structure-Conduct-Performance ("S-C-P") paradigm.

13. OII Information Request 20 asks parties to propose "metrics and sources of data that ... would be most useful and usable by the Commission to measure competition in both the retail and wholesale [telecommunications] markets," and Request 21 asks parties to discuss ways in which "the Commission [can] determine whether the prices of telephone services are just and reasonable" and to "identify the specific factors or metrics they propose the Commission use to determine whether prices are just and reasonable."[4] Fundamental to the development of the field of industrial organization (IO) is a concept that is commonly referred to in the economics literature as the *structure-conduct-performance (S-C-P) paradigm*.[5] The economists who first developed the S-C-P framework sought to identify markets in which firms exercise market

4. OII Attachment 1, Information Request No. 21.

5. See, e.g., F.M. Scherer and David Ross, *Industrial Market Structure and Economic Performance*, Third Edition (Boston: Houghton Mifflin Company), 1990, Chapter 1.

power by evaluating market concentration and barriers to entry, in an attempt to generalize the sources of market power across all sectors of the economy.[6] However, economists have since realized that the relationship between market structure and market power is extremely heterogeneous across industries; therefore, it is fruitless to compare, for example, market concentration in the telecommunications industry to market concentration in the retail grocery sector. Since the 1980s, rather than searching for evidence of market power across sectors of the economy, modern IO and Antitrust economists study industries on a case-by-case basis, combining expert knowledge of the industry with many of the analytic tools developed within the S-C-P framework.[7] When economic analysis is limited to a single sector, S-C-P provides a suitable framework for defining tests of market power of dominant firms, or more generally, tests of the "workability" or "effectiveness" of competition in a given market. Among other things, S-C-P provides a framework that can be used to define markets and to identify criteria or tests for determining whether a market is subject to effective competition, or, alternatively, whether one or more firms in that market possess market power. Market power is defined in the IO economics literature as the ability of one or more firms to influence or control the price of a product or service or to exclude competition. The "relevant" market is defined in the literature along both product and geographic dimensions and is based upon substitution possibilities both

6. Jonathon B. Baker and Timothy F. Bresnahan , "Economic Evidence in Antitrust: Defining Markets and Measuring Market Power," *Handbook of Antitrust Economics* (2008), Cambridge: MIT Press, pp. 24-29.

7. As noted by Viscusi et. al, "An increasingly influential viewpoint seems to be that differences among industries are so complex that simple generalizations (for example, fewer sellers lead to high profit rates) are invalid. What is advocated is to study industries on a case-by-case basis, applying and adapting economic models as appropriate to the industry in question" (pp. 58). W. Kip Viscusi, John M. Vernon, and Joseph E. Harrington, *Economics of Regulation and Antitrust* (1998), Cambridge: MIT Press.

in consumption (i.e., on the demand side) and in production (i.e., on the supply side).[8] The S-C-P approach is particularly appropriate for use in analyzing market conditions extant in telecommunications, because it provides a framework both for observing the behavior of individual firms and markets, and for applying those observations in assessing segment-level competitive conditions. In a complex industry such as this, no single test, trigger or condition will be dispositive. However, by examining a variety of potential S-C-P concerns, specific instances of market failure can be identified and potential surgically targeted regulatory measures can be formulated to address them.

14. Thus, the evaluation of the structural attributes of a market (market share information being the most commonly studied statistic) should be the starting point in the analysis of market power, but certainly not the stopping point. Market share information, or more generally, information on the number and size distribution of firms in a market will not be meaningful, independent of an evaluation of behavioral and performance attributes of the market. Nor, as I

8. According to Scherer (*Id.*, pp. 75-76):

> The ideal definition of the market must take into account substitution possibilities in both consumption and production. On the demand side, firms are competitors or rivals if the products they offer are good substitutes for one another in the eyes of buyers...The essence of the matter is what happens when price relationships change. If the price of Product A is raised by small but meaningful percentage and as a result consumers substitute Product B for Product A in significant quantities, then A and B are good substitutes and ought to be included under a common market definition...
>
> Substitution on the supply side must also be considered. Groups of firms making completely nonsubstitutable products may nevertheless be meaningful competitors if they employ essentially similar skills and equipment and if they could move quickly into each others' product lines should the profit lure beckon.

discuss later, will information on entry conditions to the exclusion of all other structural, behavioral, or performance attributes of a market, be meaningful either.

15. A meaningful effort to classify a market as "subject to competition" or not must involve a thorough analysis of all three types of market attributes outlined above. First, basic structural attributes should be quantitatively measured to the greatest extent possible. Second, behavioral or conduct attributes should be assessed; and third, actual performance standards of the market should be evaluated. While S-C-P provides for numerous possible quantitative analyses, the dynamics, uniqueness, and changing nature of product markets means that there is no single, universal "bright line" or benchmark that can be used to mechanically determine whether a particular test is passed or failed. For example, it is difficult to determine at what precise level of market share a dominant firm would no longer possess market power, because this level will vary by product, by market, and even by the likelihood of disputes over market definition. Obviously, the more broadly defined the market, the lower the dominant firm's market power will appear to be in that "market." But an overly broad market definition can mask the actual presence of market power in individual, and in some cases critical, segments. Only a comprehensive evaluation of market conditions will provide the information needed to make a meaningful assessment of the effectiveness of competition in a market.

16. The fundamental concept underlying the IO approach's structure-conduct-performance paradigm is that there is an empirical (and *causal*) relationship between observations about the

structure and conduct of an industry on the one hand, and measures of performance on the other. "Structure," refers to such intrinsic features of the market as:

- The number and size distribution of buyers and sellers;
- Product differentiation;
- The presence or absence of barriers to entry;
- Underlying cost characteristics of the market, including Minimum Efficient Scale;
- Vertical integration; and
- Conglomerateness.

"Conduct" refers to strategic policies and behavior of firms in a given market, including such factors as:

- Pricing policy;
- Product strategy and advertising;
- Production policies;
- Research and development, and rapidity with which new products/features are brought to market;
- Innovation;
- Coercion;
- Refusal to deal;
- Legal tactics; and
- The level of new plant investment.

Finally, "performance" concerns such elements as:

- Allocative and technical (least cost) efficiency;

- Progressiveness;
- Full employment;
- Inflation;
- Quality of product or service; and
- Equity.

The performance attributes associated with a market in which one or more firms exercise market power include:

- Higher prices relative to cost and to "competitive outcomes;"
- Reduced levels of output relative to what would exist under competitive market conditions; and
- A redistribution of wealth from customers to suppliers.

17. According to the theory, one should be able to predict ultimate market performance from observations of conduct, which in turn reflect the underlying structure of the relevant market. In general, the greater the market power present in a given market, the less competitive are the workings of that market in terms of desirable economic performance. The S-C-P paradigm provides a concrete framework for market analysis and is one that enjoys a long history and wide acceptance in the economics literature and in the antitrust courts.[9]

9. *Id.*, pp. 4-5. As noted by Scherer, the paradigm has its origins during the 1930s in work by Edward S. Mason of Harvard. Mason's seminal works are "Price and Production Policies of Large-Scale Enterprise," *American Economic Review*, vol. 29 (March 1939), pp. 61-74; and "The Current State of the Monopoly Problem in the United States," *Harvard Law Review*, vol. 62 (June 1949), pp. 1265-1285.

Structure analysis

18. Perhaps the most prominent among the techniques for measuring *structural* conditions involve measurements of market share and market concentration. There are various measures of market share, but they all are designed to reflect the relative size of the firms (and in particular, the largest firm or firms) in the market. Size can be measured in terms of a variety of metrics including both revenue and quantity-based measures of inputs and/or outputs. One widely-used structural analysis is the Herfindahl-Hirschman Index (HHI), a widely-accepted measure of concentration in competition analysis. Another is the determination of "Minimum Efficient Scale ("MES") as a means for estimating the maximum number of firms that can efficiently participate in a given market. While there are certainly other market conditions that play a role in determining the existence of market power, most industrial organization economists are in general agreement that market share measures provide a fundamental indicator of structural market power.[10]

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10. As noted by Dr. William G. Shepherd, a prominent professor of industrial organization theory: "[i]n defining the degree of competition, *market shares* are the most important single category of facts. They directly relate to the degree of market power held by each firm." (Rebuttal Testimony of the Staff of the Public Service Commission of the District of Columbia, Formal Case No. 814, Phase II, August 18, 1989, p. 13.) There is a school of economists, in particular those who consult for the Bell Companies, that argue that market share is not a useful measure of market power. Dr. Shepherd responds as follows to the "new IO theorists:"

> "New IO theorists often complain, as does Dr. Hausman, that market shares are not exact indicators of market power. That is true, because other market conditions may affect the demand elasticity associated with any given market share. Yet this caution does not mean that market shares are unrelated to market power. It merely means that comparisons of absolute degrees of market power across industries are hazardous. *Within markets*, relative market power is related to market shares, and high market shares usually involve substantial market power. (*Id*., p.14, footnote 5.)

19. Other key structural measures of market power involve barriers to entry, i.e,. structural conditions affecting the ease with which new firms can enter (or exit) the market. Some of the more important entry barriers include economies of scale or scope, sunk costs, absolute cost advantages, control over strategic facilities, including patents, and legal barriers to entry, such as the requirement for a government-issued license or franchise. Legal bars to entry have long been a key factor influencing the structure of telecommunications markets and, although many legal entry restrictions have been reduced or removed over the past two or three decades, some are still present (e.g., electromagnetic spectrum) and others exist in fact if not in law due to historic monopoly franchises and protections.

Conduct analysis

20. The second component of the S-C-P paradigm – conduct – is most directly measured by observations of the relationship between prices and costs, since the essence of monopolistic conduct is the raising of prices above costs. There are several techniques for measuring the price/cost relationship; however, perhaps the most well-known is the "Lerner Index." In its simplest form, the Lerner Index is expressed as price minus marginal cost, divided by price, i.e., the percentage mark-up of price above marginal cost.[11] In a perfectly competitive market, the Lerner Index would equal zero, as no individual firm could set its price above the competitive level and stay in business. The Lerner Index will be higher the more a firm diverges from the competitive norm. According to one study of market structure criteria, a Lerner Index above 0.5

11. A. B. Lerner, "The Concept of Monopoly and the Measurement of Monopoly Power," *Review of Economic Studies* 1 (June 1934), 157-175.

(i.e., prices exceed costs by a factor of two) indicates a noncompetitive market.[12] The Lerner Index can also be expressed in terms of the dominant firm's market share, the market price elasticity of demand, and the elasticity of supply of the competitive fringe.[13]

21. Conduct can also be measured in terms of observations of the various strategic options at a firm's disposal including, for example, price discrimination, cross-subsidization, tying contracts, bundling of competitive and non-competitive products and services, price-fixing, and refusals to deal.[14]

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12. "Market Structure Criteria to Evaluate Lessening Telecommunications Regulation," prepared by Carl E. Hunt, Jr. for the National Association of Regulatory Utility Commissioners, March 20, 1987, at 36.

13. William M. Landes and Richard A. Posner, "Market Power in Antitrust Cases," *Harvard Law Review*, Vol. 94 (March 1981), 937-996. In simple terms, the Landes and Posner formulation of the Lerner Index says that a firm's market power varies *directly* with its own market share and *inversely* with the relevant elasticities of demand and supply. The market elasticity of demand measures the response of consumers to changes in the price of a given service, and is formally defined as the percentage decrease in the quantity of service demanded by customers in a particular market in response to a one percentage point increase in the market price of the service. In a dominant firm environment, the elasticity of supply measures the response of alternative suppliers to a change in the price of the dominant firm's service, and is formally defined as the percentage increase in the quantity of service provided by competing suppliers in response to a given percentage increase in the price of the dominant firm's service.

14. *Price discrimination* occurs when different buyers are charged different prices for the same good or service, where those price differences are not related to differences in the cost of providing service. *Cross-subsidization* occurs when a firm raises the price above cost in one market and uses the supra-normal profits from that market to set prices in other competitive markets at lower levels than would otherwise be obtained. *Tying contracts* come in many shapes and sizes, but the most common type require a customer who wants to buy a certain product from a seller to buy some other product from that seller. *Price-fixing* involves some form of collusive agreement to set and secure monopolistic prices. *Refusals to deal* traditionally involve a situation in which a firm denies a competitor access to an input considered to be an essential facility.

Performance analysis

22. The power of the S-C-P paradigm lies in its recognition of the "causal flows running from market structure and/or basic conditions to conduct and performance."[15] Of course, achieving desirable economic performance objectives in an industry is (or should be) the ultimate focus of public policy. It is in this context that Scherer notes that "government agencies may choose to intervene and attempt to improve performance by applying policy measures that affect either market structure or conduct."[16]

23. Conduct by providers with respect to the pricing of those categories of telecommunications services involving large capital investments in infrastructure, high fixed costs, and a Minimum Efficient Scale ("MES") or other entry constraints that might operate to limit the number of incumbents to one or two at the most, could indicate that such providers possess and exercise market power with respect to this segment of their businesses.

Applying the S-C-P paradigm to current telecommunications market conditions in California

24. The S-C-P paradigm provides a useful framework for assessing the extent to which "competition" can be relied upon to supplant regulation and, where specific instances of market failure with respect to specific S-C-P attributes can be identified, targeted regulatory remediation

15. Scherer, *op cit*., at 6.

16. *Id*., at 7.

measures can be aimed at correcting the specific problem while minimally interfering with management prerogatives, innovation, and investment. In applying the S-C-P approach, the following specific principles require consideration and analysis; I have organized these according to the three S-C-P categories, although some involve more than one:

Analysis principles relating to structure:

(1) Multiple providers should each be capable of achieving minimum efficient scale in order for the market to be considered as capable of supporting effective competition.

(2) Market share, concentration, and market power of infrastructure-based markets must be assessed only with respect to the specific geographic areas being served by each incumbent.

(3) The number and the relative size and strength of competing firms must be sufficient to engender actual price competition.

(4) The relative positions of dominant firms may change over time without necessarily resulting in a material change in the level of market concentration.

(5) Putatively competing services may not offer fully equivalent functionality in all respects – e.g., wireline vs. wireless and circuit-switched vs. nomadic VoIP E911 service.[17]

(6) To be considered a "competitive" or "substitute" service, the candidate service must be provided by an entity other than the provider of the service whose competitive condition is being examined.

Analysis principles relating to conduct:

(7) The mere existence of any provider offering similar or substitute services is not by itself sufficient to constrain the market power of the incumbent.

(8) Effective competition requires more than two incumbent providers

(9) Persistently excessive earnings levels of the dominant firm or firms are an indication of a lack of effective competition.

(10) Pecuniary differences in the treatment of rival services can distort competitive markets and produce inefficient outcomes.

17. The FCC defines "Nomadic interconnected VoIP" as "[a] service whose terms allow use over any broadband connection available to the subscriber (such as at a hotel or vacation residence); by contrast, a non-nomadic service subscription must be used over a single predetermined broadband connection. " https://apps.fcc.gov/edocs_public/attachmatch/DOC-329975A1.pdf (accessed 3/8/16).

(11) Competitor dependence upon "essential" inputs from an upstream provider with substantial market power can undermine the effectiveness of competition, especially if the upstream provider is itself involved in the same downstream market.

(12) Persistent refusal on the part of a facilities-based service provider to deal with downstream entities is itself compelling evidence of that provider's market power.

(13) Control of infrastructure creates incentives and opportunities for dominance of downstream and adjacent product markets.

(14) High switching costs present a significant barrier to entry and competition.

(15) The presence and persistence of onerous terms and conditions in customer service adhesion agreements provide further evidence of a fundamentally noncompetitive market

(16) Monopoly power and monopsony power must be separately assessed, because the presence of substantial monopsony power may also permit the expansion of monopoly power in what otherwise might be competitive market segments.

Analysis principles relating to performance:

(17) Persistent service quality and customer service issues may suggest a lack of effective competition.

(18) A key factor in evaluating the performance of a deregulated telecommunications market is the extent to which universal service deployment and availability has been achieved.

(19) A key factor in evaluating the performance of a deregulated telecommunications market is the extent to which effective and sustainable competition has been achieved.

In the following sections, I shall examine each of these principles in detail.

Structure

(1) ***Multiple providers should each be capable of achieving minimum efficient scale in order for the market to be considered as capable of supporting effective competition.***

25. Industries characterized by high fixed costs typically exhibit a property of "decreasing average costs" as output levels increase. As Figure 1 illustrates, economic theory suggests that as output increases, average and marginal cost at first decreases, but beyond a certain level, marginal cost begins to increase and, as a result, average cost begins to rise above its minimum level. There are a variety of explanations for this outcome. For example, once the fixed capital assets are at their capacity, additional fixed assets would need to be acquired in order to expand

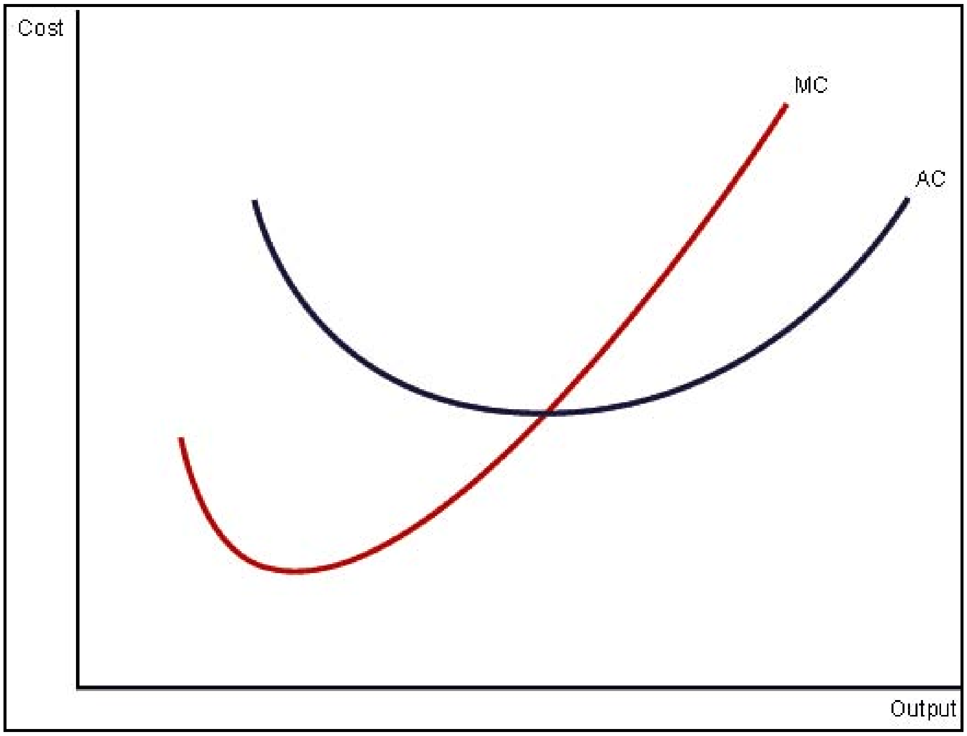

Figure 1. As output increases, average and marginal cost at first decrease, but beyond a certain level, marginal cost begins to increase and, as a result, average cost begins to rise above its minimum level.

output further. (The marginal cost of an additional airline passenger on a plane with empty seats is close to zero, such that the average cost per passenger declines until the last seat is filled. Once that occurs, however, it would be necessary to roll out another plane to serve the next passenger, resulting in a large jump in marginal cost and an increase in average cost.)

26. Minimum Efficient Scale ("MES") is typically expressed as the percentage (share) of the total market where minimum average cost is achieved.[18] Industries characterized by relatively

18. See Tirole (1988) for discussion of MES and barriers to entry. Jean Tirole, *The Theory of Industrial Organization* (1988), Cambridge: MIT Press, pp. 305-311.

low MES can support multiple competitors; where the MES is at or near 50%, only two efficient firms can coexist. And where the MES materially exceeds 50%, the market will be capable of supporting only one incumbent – this is the "natural monopoly" situation. The cost of constructing a broadband distribution infrastructure is driven primarily by the *number of homes passed*, rather than by the number of *homes connected* (i.e., revenue-producing customers). Once the cable or fiber facilities have been put in place, the costs of adding additional customers to an existing network is relatively small. Thus, the "first mover" enjoys a significant cost advantage over any potential "overbuilder," since the latter will be confronted with up-front capital costs that, from the perspective of the incumbent, had been incurred in the past and are now sunk. Empirical evidence confirms this condition. From the analysis of the Commission's Broadband Availability Database that I undertook on behalf of ORA in connection with each of the three recent "change of control" proceedings,[19] I found that the overwhelming majority of California households were passed by only one broadband provider offering service at download speeds of 25 Mbps or greater. Of the 10.5-million California households passed by the four joint applicants in the Comcast/TWC/Charter/Bright House merger case, only 2.38-million, or about 22.7%, were also passed by at least one competitor. I noted a similar pattern in the Charter/TWC/Bright House proceeding. However, for Verizon/Frontier, more than 99% of households where *FiOS* was available could also obtain 25/3 broadband from another provider, typically the local cable operator. These results are summarized in Table 1 below:

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19. The Comcast/TWC/Charter/Bright House merger (A.14-04-013, A.14-06-012), the transfer of Verizon California ILEC operations to Frontier (A.15-03-005), and the TWC/Charter/Bright House merger (A.15-07-009).

Table 1

CALIFORNIA HOUSEHOLDS PASSED BY ONE OR MORE PROVIDERS OFFERING BROADBAND SPEEDS OF AT LEAST 25 Mbps DOWNLOAD/3 Mbps UPLOAD

Case	Total Households Passed	Number served only by Joint Applicants	Percent served only by Joint Applicants	Number served by at least one competitor	Percent served by at least one competitor
Comcast/TWC/Charter/Bright House	10,500,199	8,116,479	77.30%	2,383,720	22.70%
Verizon/Frontier	1,551,378	8,816	0.57%	1,542,562	99.43%
TWC/Charter/Bright House	6,384,819	4,495,288	70.41%	1,889,531	29.59%

Sources: CPUC Broadband Availability Database, Round 10 (Comcast/TWC); Round 11 (Verizon/Frontier, TWC/Charter/Bright House)

There are a few isolated instances where three providers (typically, the incumbent cable MSO, an ILEC, and one smaller rival) offer 25/3 wireline broadband, but overall this occurs in only about 0.67% of households in the areas I studied in the three proceedings. These data thus suggest an MES of at least 50% of the total market, if not closer to 100%.

27. Those segments of the telecommunications industry that require a physical last-mile distribution infrastructure – ILECs and cablecos – typically exhibit relatively high MES. Facilities-based local telephone service, broadband Internet access, and cable-based MVPD services have almost never been capable of supporting multiple facilities-based providers at the infrastructure level. At most, two such providers (an ILEC and a cable system) may each have achieved sufficient (if not Minimum Efficient) scale as a result of their previously non-overlapping market activities that duopoly-level competition is at least theoretically possible.

28. However, empirical evidence suggests that even this may be difficult. In 2004, Verizon embarked upon an ambitious fiber-to-the-home (FTTH) territory-wide deployment branded as *FiOS* to provide voice service, broadband Internet access, and video, intended to challenge and capable of competing with all services being offered by the cable MSOs. In 2010, Verizon announced that it was going to discontinue the *FiOS* rollout, and concurrently started selling off parts of its *FiOS*-enabled network to Frontier and other ILECs, and in its 2015-2016 sale to Frontier, continues to do so. Other "overbuilders" have similarly been forced to scale back or discontinue broadband projects.[20]

29. By contrast, MES for wireless carriers appears to be well below even 25%. Although CMRS providers are infrastructure based (in terms of towers, antennas, radio transceivers, and wireline backhaul network facilities), much of this is under lease or under shared use arrangements, enabling individual carriers to achieve a much lower MES than would be possible if each carrier owned all of the infrastructure that it utilizes. Wireless carriers do not own all, or even, most, of their antenna towers, and some of these have recently been divested to third-party operators who then lease back capacity to multiple individual carriers. Backhaul facilities are leased from ILECs or other carriers, and the physical ILEC facilities themselves are shared among multiple CMRS carriers and other ILEC customers across a broad range of wireline carrier services. Competition among four or more CMRS providers is thus feasible as an

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20. For example, RCN, formed in 1993, began an ambitious cable overbuild in several major markets including Boston, New York, eastern Pennsylvania, Washington, DC, and Chicago, only to curtail further expansion after 2000 due to a cash shortage . Dodd, Annabel, *The Essential Guide to Telecommunications,* Prentice-Hall, 2002, at 155. After investing some $23-billion in *FiOS*, Verizon ultimately determined that it would not initiate a new *FiOS* build in new markets after 2010.

economic matter, and is actually taking place.[21] Natural entry barriers exist in the case of wireless, since possession of spectrum is critical, and there is only so much spectrum to go around. Thus, entry may still be limited, but the relatively low MES is capable of supporting a sufficient number of firms such that effective competition in this market is realistic.

30. While some wireless costs are fixed across a broad range of subscriber quantities, a substantial portion of wireless carrier capital and operating expenses are scalable with volume, and tend to vary in direct proportion to the total number of subscribers. Figure 2 below plots the total number of US wireless cell sites against the total number of wireless subscribers over the period 1999-2008. Figure 3 plots the total number of US wireless carrier employees against total subscribers over the same period. In both cases, the number of cell sites and the number of employees increases linearly with respect to the total number of subscribers. Figures 4 and 5 reproduce figures I presented in testimony before the FCC on June 12, 2008 using data specific to Sprint, derived from its annual 10-K reports.[22] I plotted total operating expenses and, separately, total Property, Plant and Equipment (PPE) investment against the total number of Sprint subscribers over the period 1999 through 2005. In both cases, the opex and PPE varied linearly with respect to subscriber volume.

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21. The fact that, on several occasions, several CMRS carriers have sought to merger does not alter this conclusion. If permitted to merge, the then-smaller number of incumbents will be able to allocate market share by following traditional Cournot-type game theory, thereby increasing prices and profits.

22. Statement of Lee L. Selwyn before the Federal Communications Commission *en banc* hearing on wireless early termination fees, June 12, 2008, at 10-11.

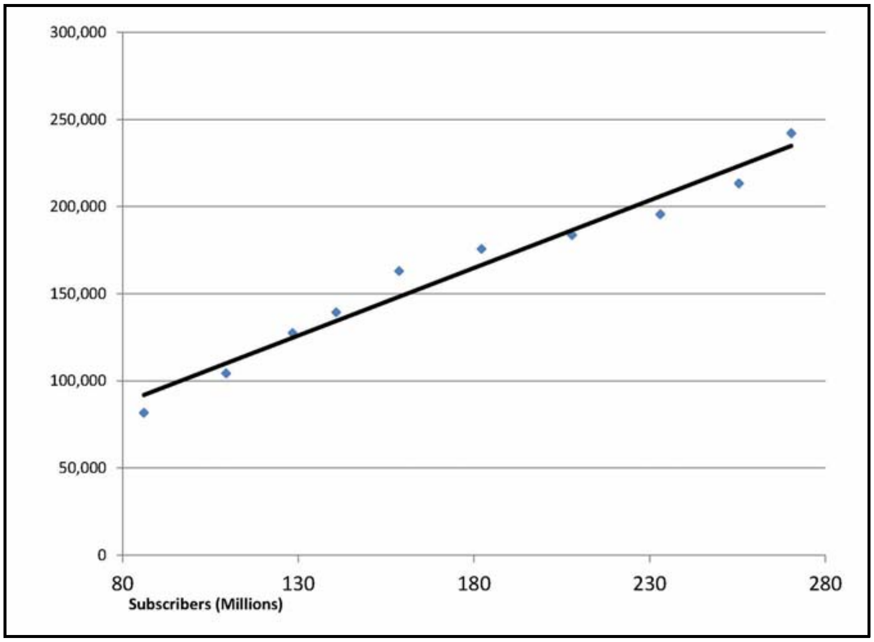

Figure 2. A plot of the total number of US wireless cell sites against. the total number of wireless subscribers over the period 1999-2008.

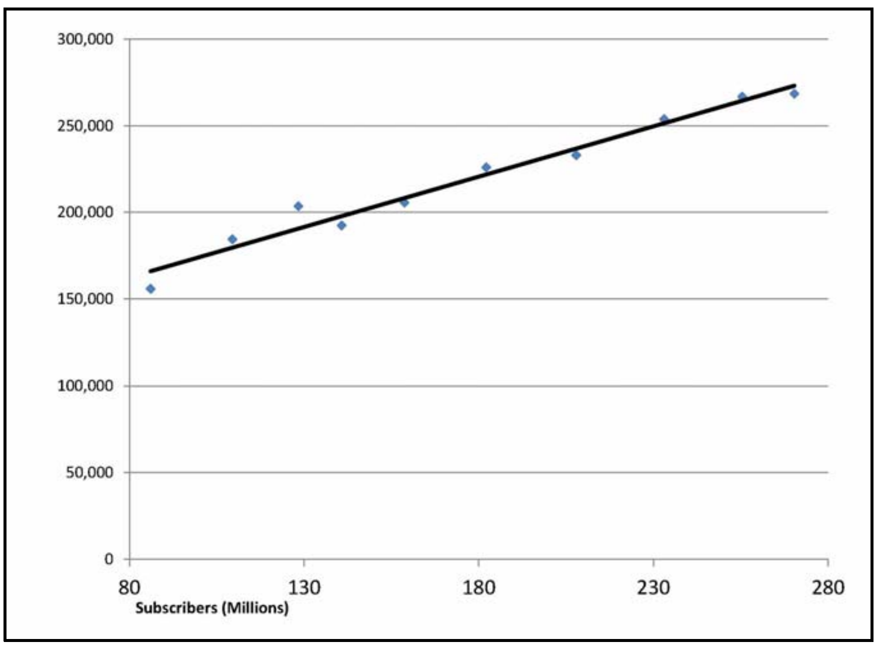

Figure 3. A plot of the total number of US wireless carrier employees against the total number of wireless subscribers over the period 1999-2008.

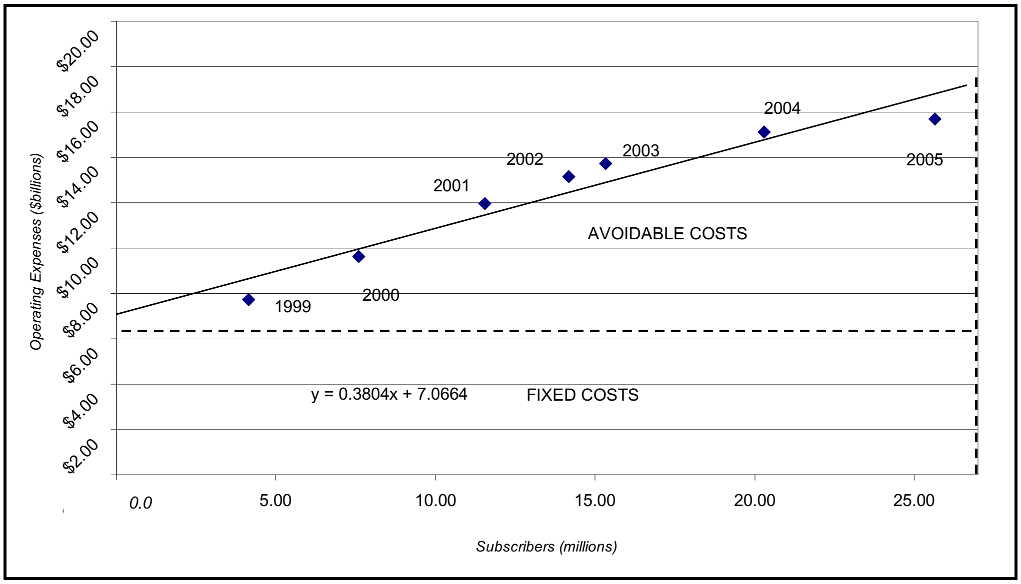

Figure 4. Sprint Wireless Segment operating expenses including depreciation, amortization and cost of capital, excluding costs associated with optional charges, vs. number of subscribers, 1999-2005.

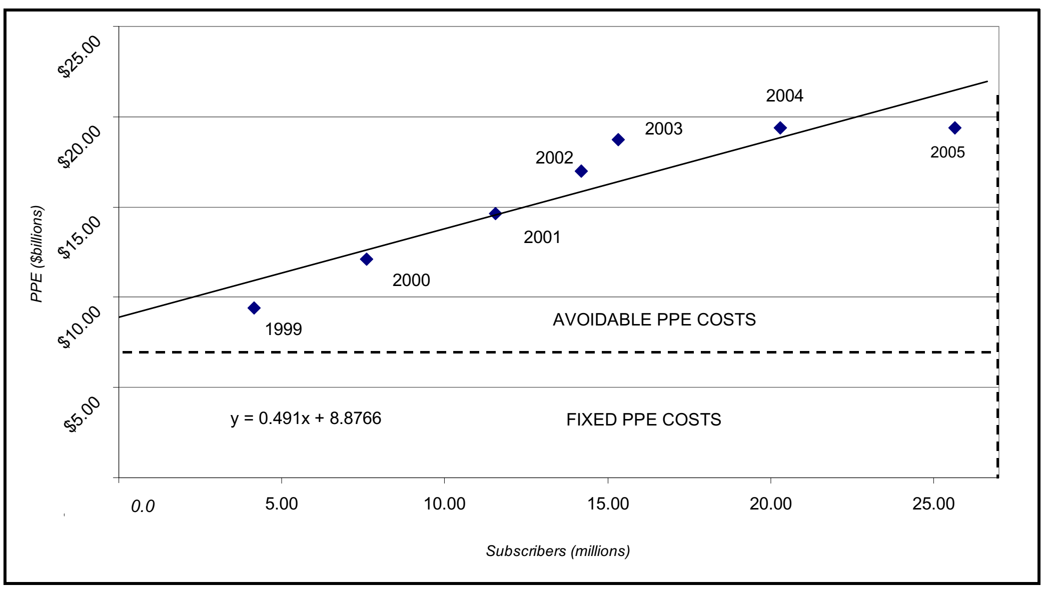

Figure 5. Sprint Wireless Segment Property Plant and Equipment (PPE) vs. Number of Subscribers, 1999-2005.

31. As these data demonstrate, wireless investment, employment and overall operating expenses are scalable with changes in the total volume of business above a base level of fixed costs. In contrast, broadband access costs vary with homes passed, not with homes connected. Thus, where wireless services can support multiple efficient competitors, broadband access services are, in most areas, available from only a single provider.

32. Long-haul interexchange and Internet Backbone services are also capable of supporting multiple providers, as has been confirmed empirically by the existence of many such firms over an extended period of time. In fact, the "long distance" segment was the first to be opened to competition, beginning in the early 1970s.

33. Importantly, and as demonstrated in the cases of wireless and long-haul transport, MES can vary significantly from one sector to the next. The MES for a successful downstream retail operation is substantially lower than for the underlying infrastructure services because fixed costs are materially lower. Competition has the potential to develop and thrive in such non-infrastructure segments, provided that downstream competitors are afforded the ability to obtain access to the underlying network infrastructure at cost-based rates.

34. The presence of a relatively high MES – in the range of 50% or more – means that further entry will be difficult, if not impossible, except perhaps at a niche level. Without the threat of actual or potential entry, the one or two incumbent providers will possess the ability to set and sustain prices at supracompetitive levels, resulting in excess (monopoly) earnings that

can persist indefinitely without challenge by an actual or potential entrant. In a market capable of supporting two firms – i.e., where the MES is at or near 50% – it is unrealistic to expect either firm to engage in any serious price-based competition with its sole rival. A two-firm (duopoly) market of this type, where further entry cannot realistically be expected to arise, is likely to exhibit conduct that is little different from that which would arise under a total monopoly structure.

(2) Market share, concentration, and market power of infrastructure-based markets must be assessed only with respect to the specific geographic areas being served by each incumbent.

35. Infrastructure-based market segments are necessarily linked to the specific geographic coverage passed by the infrastructure. In several recent merger proposals (e.g., TWC/Comcast), the parties have argued that because their infrastructure footprints do not overlap, they do not compete with one another and thus their merger cannot be viewed as having any negative impact upon competition. There are, of course, other non-infrastructure considerations, such as the merging parties' potential to enter and compete in markets that are not linked to their respective infrastructure (e.g., Online Video Distribution ("OVD") and other "Over-the-Top" ("OTT") entries, or content production, which might well involve the others' core operating area absent the merger, as well as the increase in the combined companies' monopsony market power relative to content providers and other inputs to their overall service production.

36. The logical extension of this "we don't compete in each other's core infrastructure area" argument would also require that any analysis of competition and market share must necessarily

be limited to the specific geographic areas involved. From the perspective of an individual consumer, it doesn't particularly matter if the broadband provider(s) that offer(s) service at the consumer's residence serve only the immediate community or a large swath of territory across the state (and perhaps beyond). Where fixed infrastructure is involved, the "relevant geographic market" could well be defined at the individual customer level, because from the perspective of any given customer, any provider that does not offer service at the customer's address is simply not relevant.[23]

37. This "location-specific" approach to defining the relevant geographic market was applied by the U. S. Department of Justice in responding to the 2005 ILEC/Interexchange Carrier ("IXC") mergers of AT&T with SBC and of Verizon with MCI. Prior to these mergers, both of the IXCs – AT&T and MCI – had deployed fiber optic cable facilities to commercial buildings in major business centers so as to compete directly with the incumbent LEC in these markets. In those areas served by the ILEC merger partner, the effect of the merger would be to eliminate a competitor at those specific "lit" buildings where both the ILEC and the IXC had a presence. Thus, where SBC was the ILEC, buildings served by both AT&T and SBC, such as in the San Francisco financial district, would experience the elimination of one competitor at each such location. The DoJ had based its opposition to these mergers upon this specific outcome. The

23. As a personal example, Comcast is the only source of 25/3 broadband available to me at my home in Brookline, Massachusetts. Around the corner, approximately 500 feet from my house and within the same Census Block,, 25/3 broadband is available from an overbuilder, RCN, as well as from Comcast. Some years ago, the Town of Brookline issued a franchise to RCN with the goal of creating a competing cable TV provider throughout the Town. However, after building out service in some areas, RCN ran out of money and discontinued further expansion of its network, and has no plans to resume its build-out program. The fact that two providers offer service 500 feet from my home is of no consequence to me – my only source of broadband is and will indefinitely remain Comcast.

DoJ defined the relevant geographic markets for the two specific products of concern – Local Private Lines, as well as voice and data telecommunications services that rely on Local Private Lines – as "no broader than each metropolitan area and no more narrow than each individual building."[24] The Department's focus was, however, on specific buildings then being served by the ILEC and by the merging IXC. As DoJ economist W. Robert Majure explained:

> As set forth in the Complaints, the Department identified harm in the market for the sale of local private lines. This harm is predicted in situations where only AT&T and SBC or MCI and Verizon, respectively, were capable of supplying local private lines before the merger and no other CLEC was likely to connect the building to its network. After the merger, SBC or Verizon would be the only possible supplier of local private lines to those buildings, and they could raise prices without fear of competition. In practice, the fact that the merged firms would no longer face competition from a CLEC in these buildings is likely to result in higher prices or lower quality (e.g., less responsiveness to service outages or requests to provide new circuits) for local private lines, or for packages of telecommunications services that include local private lines into the affected buildings, all to the detriment of consumers.[25]
>
> In these cases, the proposed remedies are straightforward. They require the divestiture of connections into the buildings identified as problematic in the Complaints. In each building, the buyer of the divested assets would step into the shoes of AT&T or MCI. As new sales opportunities arise in the buildings, the buyer will be positioned to offer an alternative to SBC or Verizon. All customers - the tenants in the building as well as the carriers who need to buy a connection in order to sell their services to tenants - will have a choice of two facilities-based providers, just as they did before the mergers.[26]

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24. *U.S. v. SBC Communications, Inc. and AT&T Corp.*, D.D.C. Civil Action No.: 1:05CY02102 (BGS); *U.S. v. Verizon Communications Inc. and MCI, Inc.,*, D.D.C. Civil Action No.: 1:05CY02103 (BGS), Complaint of the Department of Justice, filed 10/27/05, at para. 24.

25. *Id.*, Declaration of W. Robert Majure on behalf of the Department of Justice, Case 1:05-cv-02102-EGS. Document 133-3, Filed 08/09/2006, at para. 13.

26. *Id.*, at para. 16.

In parallel consent decrees that settled both the AT&T/SBC and Verizon/MCI cases, the DoJ required divestiture of the AT&T (or MCI) facilities to a competing fiber optic Local Private Line provide0r,[27] so as to maintain the same number of providers at the affected buildings.

38. As the Department of Justice and, ultimately, the United States District Court concluded, the markets for Local Private Lines and for the services that utilize Local Private Lines are location-specific. What matters to customers at any given location is the availability of a competing provider *at that location*, not somewhere else in the city, town or county. Although the DoJ's focus in the Tunney Act proceedings was on services being furnished to *commercial* buildings, the same principle applies with respect to any fixed wireline service. Accordingly, the Commission should require that data on service availability be provided for areas *no larger than individual Census Blocks*. In the case of fixed wireline services, it is simply not sufficient to examine geographic markets covering broad areas wherein which decidedly different competitive conditions may exist.

39. Notably in the case of broadband, even when the relevant geographic market is defined with respect to individual service locations, a provider with an extensive geographic footprint may be in a better position to dictate terms to upstream content providers and/or to bundle its broadband service with other services, thereby exerting somewhat greater market power over its customers than the counterpart with a small geographic footprint, even in the same locations.

27. *Id.*, Document 234, *Order,* Filed 03/29/2007.

(3) The number and the relative size and strength of competing firms must be sufficient to engender actual price competition.

40. Even in a market with two roughly equal sized incumbents, experience has demonstrated that price-constraining competition will not arise in highly concentrated markets consisting of one or two large firms and (perhaps) multiple smaller firms. A market with two primary incumbents of roughly equal size where the prospect of further entry is minimal to impossible is a special case of oligopoly known as a *duopoly*. Generally in such markets, the two firms will find it far more profitable to engage in a (tacit or overt) market allocation strategy than to attempt to aggressively compete against one another, particularly with respect to price. In competitive markets, all firms are price-takers, and the market price moves to marginal cost. In monopoly markets, a single firm is a price-setter, and sets its price above marginal cost at a level that maximizes its economic profits. In a duopoly market, two firms carve up all of the available demand in the market. While each duopoly will exhibit unique characteristics, it is widely acknowledged that firms in duopoly markets will, like a monopoly, charge a price in excess of marginal costs (albeit somewhat lower than might exist under a monopoly). Both firms exercise market power, and both will have the ability to make price-setting decisions. These conditions can and do exist, even in the absence of overt collusion.

41. These conclusions are borne out in the standard oligopoly models. For example, in so-called *Cournot* duopolies, both firms exercise market power, and can affect the market price by

their decisions.[28] This is at odds with a competitive market, where firms have no market power, and similar to a monopoly, where one firm can choose the market price. In a *Cournot* duopoly, output will be lower than in a competitive market, and prices will be higher.[29] While the *Cournot* model is perhaps most widely accepted, other duopoly theories have also been advanced.

42. The classic *Bertrand* duopoly theory, as in *Cournot*, suggests that both firms exercise price-setting market power, but assumes that here both firms must choose a market price that will prevail indefinitely, and that the firm with the lower price will capture 100% of the market. Rather than risk zero sales if it fails to set its price below that of its rival, the theory posits, the two firms will each set their price at marginal cost. This assumption, however, is highly unrealistic, and would rarely occur under actual marketplace conditions. Relaxing these assumptions even slightly, such as by allowing firms to change prices after selecting an initial price, or by assuming that one firm would not be able to serve 100% of the market, results in prices that behave much as the *Cournot* model would predict.[30] The *Stackelberg* model assumes that one of the two firms is a market leader and that the other is a follower, thus relaxing the two firms of roughly equal size requirement of the *Cournot* model. Much like other theories of

28. See Carlton, D. W. & J. M. Perloff, *Modern Industrial Organization, Second Edition*, HarperCollinsCollegePublishers: New York, NY (1994), at Chapter 7, pp. 232-244.

29. Case and Fair, *Principles of Microeconomics*, 7th Edition, 2004, at 291; W. Kip Viscusi, et al, *Economics of Regulation and Antitrust*, Second Edition, MIT Press, 1998, at 102, ("Viscusi").

30. *Viscusi*, at 109.

duopoly, however, *Stackelberg* theory suggests that, again, both firms have price-setting market power, and that prices will exceed marginal costs.[31]

43. All of these models require several rigid assumptions that are highly unlikely to be met in any market. These assumptions include that firms have complete information about market demand, adhere strictly to the pricing/output rules of each theory, and produce homogenous products. In practice, and without any need for overt collusion, the two incumbents will gravitate toward an equilibrium in which near monopoly price levels will be sustained because, even in the absence of outright collusion, each incumbent will tend to make price/output decisions with respect to the other's expected (and typically predictable) response, as best described by *Cournot*.

44. There is in fact considerable empirical evidence in telecom to support the notion that "two is not enough" to achieve a competitive outcome. When the FCC initially authorized Commercial Mobile Radio Service (CMRS) in 1982, it created two equal sized blocks of spectrum in the 800 MHZ band in each of about 700 Cellular Geographic Service Areas ("CGSAs") and granted one of the two blocks to each of two rival providers – an affiliate of a wireline incumbent LEC serving all or part of a CGSA (the so-called "B" block) and an applicant with no such affiliation (the so-called "A" block). These initial CMRS licensees were granted without charge, at first through a competitive application process and, ultimately,

31. *Viscusi*, at 108.

through lotteries. This duopoly market arrangement in each CGSA persisted well into the mid-1990s.

45. In 1993, Congress authorized the FCC to issue additional spectrum licenses through an auction process,[32] increasing the number of potential rival providers in each market to four, five or in some cases six. By year-end 2000, there were six major carriers with a nationwide scope (Verizon Wireless, Cingular, AT&T, Sprint PCS, Nextel, and Alltel) and a number of others with more limited geographic presence.[33] Some of the major regional CMRS providers in existence at that time included VoiceStream, US Cellular, Western Wireless, Powertel, and Quest.[34] By the end of 2006, the number of national providers had dwindled to four. AT&T and Cingular had merged (following the mergers of parent companies AT&T, SBC and BellSouth), and Sprint and Nextel had merged. Alltel, Metro PCS, and Leap were still identified as independent companies.[35] By the end of 2010, there were approximately 292.5-million wireless handsets in the US, of which about 266.7-million – roughly 92% – were being served by the four largest carriers.[36] Alltel (which had acquired Western Wireless in 2005) had by then been absorbed into Verizon. Leap, together with its Cricket brand, were still operating independently

32. *Omnibus Budget Reconciliation Act of 1993*, Pub. L. 103-66, Aug. 10, 1993, 107 Stat. 312, as amended.

33. FCC, Sixth Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, rel. July 17, 2001, at p. C-4, Table 3.

34. *Id.*

35. FCC, Twelfth Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, rel. February 4, 2008, at p. 132, Table A-4.

36. FCC, Sixteenth Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, rel. March 21, 2013, at p. 55, Table 13.

of any of the "top four," until Leap was acquired by AT&T in 2014. By June 2014, the most recent date for which FCC data is available, there were 356.2-million "connections," of which 350.8-million – about 98.5% – were being provided by four carriers – Verizon, AT&T, Sprint and T-Mobile.[37]

46. The FCC has been calculating the Herfindahl-Hirschman Index (HHI), a widely-accepted measure of concentration in competition analysis, on an annual basis since 2008. The following chart from the FCC's Seventeenth CMRS Report shows the progression of increases in wireless HHI from 2008 through the end of 2013. The HHI has exceeded 2,500 in each of those years. 2,500 is the threshold level for "Highly Concentrated" markets as specified in the Department of Justice/Federal Trade Commission *Horizontal Merger Guidelines*.[38] Figure 6 below shows the wireless HHI increasing from 2,693 in 2008 to 3,027 in 2013.

37. FCC, Seventeenth Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, rel. December 18, 2014, at p. 11, Table II.B.1. The Seventeenth Report uses "connections" instead of "subscribers" to refer to the total number of connected wireless devices, which includes, in addition to handsets and smartphones, tablets and others.

38. The US Department of Justice/Federal Trade Commission's 2010 *Horizontal Merger Guidelines* ("*HMG*") defines a market with an HHI in excess of 2500 as "highly concentrated," and suggests that "[m]ergers resulting in highly concentrated markets that involve an increase in the HHI of more than 200 points will be presumed to be likely to enhance market power." United States Department of Justice and Federal Trade Commission, *Horizontal Merger Guidelines 2010 edition* ("*HMG*"), at §5.3, Market Concentration.

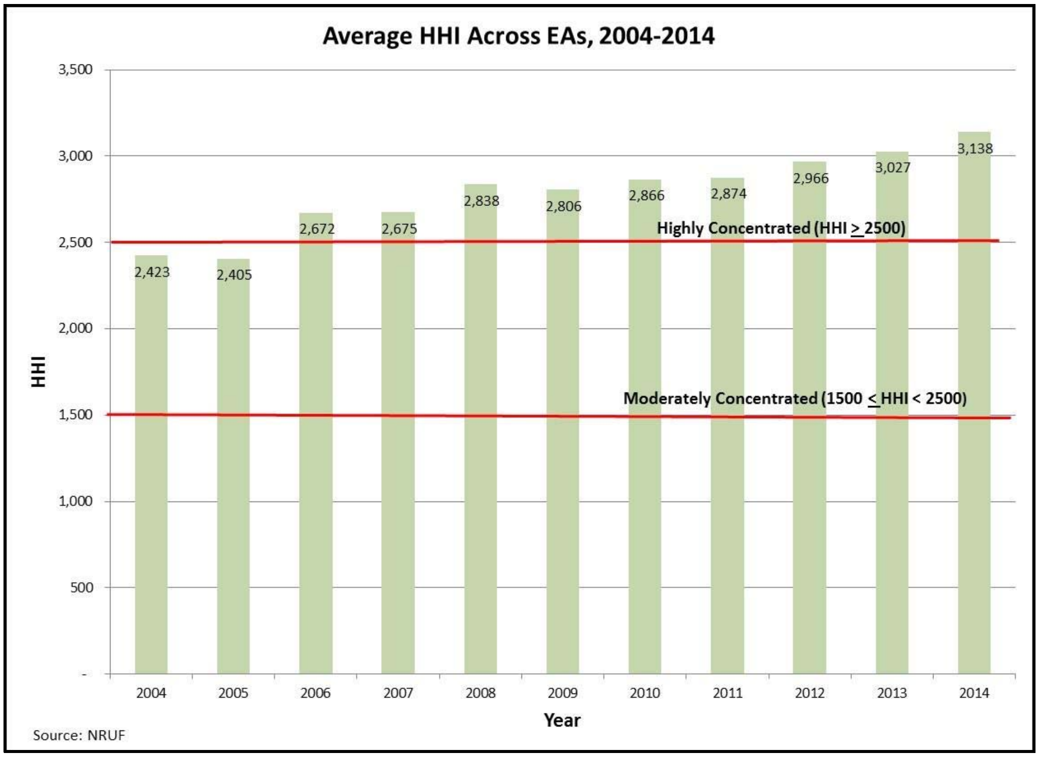

Figure 6. Progression of increases in Commercial Mobile Radio Service HHI over the period 2004-2014. Source: FCC Eighteenth CMRS Report, at p. 17, Chart II.C.1.

The FCC calculated HHIs for each of 146 separate Economic Areas ("EAs"), and then developed a weighted average industry HHI based upon EA populations.[39] The Seventeenth Report also provides the HHIs for each of the studied EAs. Table 2 below provides the FCC 2013 HHIs for the six California EAs that were calculated:

39. Seventeenth CMRS Report, at 17.

Table 2

**WIRELESS HHIs FOR CALIFORNIA ECONOMIC AREAS
2011-2013**

EA No.	Economic Area	2011	2012	2013
162	Fresno	2953	2989	3787
165	Redding (incl. part of OR)	3299	3405	3621
161	San Diego	2581	2637	2913
163	San Francisco-Oakland-San Jose	2720	2742	2899
164	Sacramento-Yolo	2727	2741	2882
160	Los Angeles-Riverside-Orange County	2415	2437	2634

Source: FCC, Seventeenth Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, rel. Dec. 18, 2014, at 111-115, Table II.C.1.

The wireless market in all of the California EAs has, like the industry nationally, shown a steady progression of HHI increases over the 2011-2013 period, and all are now "highly concentrated."

47. In my July 28, 2015 Reply Testimony in the Verizon/Frontier change-of-control proceeding, I calculated a broadband access HHI for the areas of California that would be served by Frontier following its acquisition of Verizon California's operations, utilizing the current FCC 25/3 definition of "broadband." I made these calculations utilizing the same methodology that has been employed by the FCC in calculating wireless HHIs as discussed above. However, whereas the FCC's calculations were based upon actual "subscription" or "connection" data, the Commission's Broadband Availability Database contains only "availability" data, not actual subscriptions or customer counts, by census block. Using the most conservative approach for purposes of this calculation, I have assumed that where only one provider offers service at the 25/3 or greater speed, that provider's market share *in those census blocks* is 100%. Where two

providers offer 25/3 or greater speed access, I have assumed that each provider's share is 50%. And where three or more providers offer 25/3 access, I have assumed that each provider's share *in those census blocks* is 33.3%. I then calculated an overall average HHI of 7,015 weighted by the number of households in each census block. The results of this calculation are shown on Table 3:

Table 3

WEIGHTED AVERAGE HERFINDAHL-HIRSCHMAN INDEX (HHI) FOR THE 25 Mbps DOWNLOAD/3 Mbps UPLOAD BROADBAND ACCESS MARKET WITHIN COMBINED VERIZON CALIFORNIA AND FRONTIER CALIFORNIA SERVICE AREAS

	Number of Providers offering 25/3 Broadband Access			
	1	2	3	TOTAL
Households passed	1,079,780	1,563,511	19,394	2,662,710
Assumed market share per provider	100%	50%	33.33%	
HHIs in individual CBs	10,000	5,000	3,333	
Weights	0.4055	0.5872	0.0073	1.0000
Weighted average HHI				7,015
Source: Analysis of California Broadband Availability Data				

Note that while the overall weighted average HHI for 25/3 broadband access within the post-transaction Frontier service area is 7,015, even in the few (0.73% of) census blocks where three providers are offering service, the HHI for those census blocks is still in excess of the 2,500 "highly concentrated" threshold. For the 58.7% of households where two providers are available (for the most part, Frontier and a local cable operator), the HHI is still at 50%. And for the 40.6% of households that confront only a single broadband provider, the HHI is at 10,000, the absolute maximum.

48. I made a similar HHI calculation for the ten southern California counties that will be the primary market focus of the proposed New Charter following the merger of Charter Communications, Time Warner Cable, and Bright House Networks, as summarized in Table 4 below:

Table 4

WEIGHTED AVERAGE HERFINDAHL-HIRSCHMAN INDEX (HHI) FOR THE 25 Mbps DOWNLOAD/3 Mbps UPLOAD BROADBAND ACCESS MARKET WITHIN THE SOUTHERN CALIFORNIA SERVICE AREAS

Number of Providers offering 25/3 Broadband Access						
Number of Providers	**1**	**2**	**3**	**4**		
Assumed market share per provider	100%	50%	33.33%	25%		
HHIs in individual CBs	10,000	5,000	3,333	2,500		
Company	**Number of Households Passed**					**Weighted Average HHI**
Time Warner	3,320,450	1,482,719	20,882	-	4,824,051	8,434
Charter	694,504	434,929	9,383	-	1,138,816	8,036
Bright House	201,680	5674	-	-	207,354	9,863
"New Charter"	4,251,476	1,861,761	14020	-	6,127,257	8,466
Source: California PUC Broadband Availability Database, Round 11 data (as of December 31, 2014) as submitted by ISPs.						

These HHI analyses were based upon *availability*, not actual subscriptions, and utilized data that was current as of December 31, 2014. ORA anticipates submitting revised HHI calculations for the areas served by all major broadband providers statewide based upon the Form 477 and other data that the Respondents to this OII are expected to submit on this date.

(4) The relative positions of dominant firms may change over time without necessarily resulting in a material change in the level of market concentration.

49. The relative market positions of the principal service providers need to be reviewed periodically. While the market power of ILECs may have diminished in certain respects, the market power of the incumbent cable MSOs has mushroomed in recent years. One cannot assume that merely because the MSOs started out competing with the ILECs, their respective market positions have remained unchanged.

50. To a significant extent, the MSOs have *replaced* the ILECs as the dominant provider of a wire into the home, particularly where the ILEC is not able to offer a level of broadband access that is functionally equivalent to that being offered by the local cable system or capable of meeting the current FCC minimum threshold for "broadband" of 25/3 Mbps download/upload speeds. As I noted earlier, this is the prevailing pattern in California, where the vast majority of households are offered 25/3 broadband only by their cable TV provider, and not by their ILEC. As a result, the broadband monopoly now being wielded by the MSOs rivals that of the ILECs' position in the voice market at the pinnacle of the latters' market power.

51. Regulatory policy has failed to keep pace with this evolution. As ILECs' market power has been eroded, so too has the extent of their regulation. Today, few ILEC services are subject to price regulation of any sort, and most large ILECs are no longer subject to any earnings-related constraints. But the reverse has not taken place as the dominance of cable MSOs has increased. With extremely limited exceptions, cable and broadband rates are not regulated or

constrained to "just and reasonable" levels. Moreover, since neither broadband nor basic cable had been treated as Title II Common Carriers until the FCC's *Open Internet Order* in 2015 applied Title II regulation to broadband,[40] these firms were not subject to any unbundling and interconnection requirements such as those applicable to ILECs at Sections 251/252 of the *Telecommunications Act of 1996*. Even now that the FCC has reclassified broadband as a Title II Common Carrier service, it has expressly determined that it will forbear from applying most aspects of common carrier regulation including, in particular, Sections 251/252.[41]

(5) Putatively competing services may not offer fully equivalent functionality in all respects.

52. The extent to which any given service may be a competitive alternative to a traditional incumbent provider offering will necessarily depend upon the extent to which that service is a substitute for the original. The degree of substitutability is often "in the eye of the beholder." Consider, for example, basic wireline local telephone service. Mobile wireless (CMRS) may be

40. *Protecting and Promoting the Open Internet*, FCC GN Docket No. 14-28, *Report and Order on Remand, Declaratory Ruling, and Order*, Adopted: Feb. 26, 2015; Rel: March 12, 2015, FCC 15-24 ("Open Internet Order").

41. However, the FCC has expressly indicated that it may modify this forbearance policy in the future if conditions warrant. *Id.*, at para. 203: "... Given the constantly evolving market for Internet traffic exchange, we conclude that at this time it would be difficult to predict what new arrangements will arise to serve consumers' and edge providers' needs going forward, as usage patterns, content offerings, and capacity requirements continue to evolve. Thus, we will rely on the regulatory backstop prohibiting common carriers from engaging in unjust and unreasonable practices. Our "light touch" approach does not directly regulate interconnection practices. Of course, this regulatory backstop is not a substitute for robust competition. The Commission's regulatory and enforcement oversight, including over common carriers, is complementary to vigorous antitrust enforcement. Indeed, mobile voice services have long been subject to Title II's just and reasonable standard and both the Commission and the Antitrust Division of the Department of Justice have repeatedly reviewed mergers in the wireless industry. Thus, it will remain essential for the Commission, as well as the Department of Justice, to continue to carefully monitor, review, and where appropriate, take action against any anti-competitive mergers, acquisitions, agreements or conduct, including where broadband Internet access services are concerned." Footnote references omitted.

a close substitute for wireline where the need is limited to placing and receiving voice telephone calls. But even that has its limitations. For example, if the quality of the wireless signal at the customer's home is weak, the customer may not perceive wireless as a good substitute for wireline. Sometimes the customer will want a phone for the family, to be answered by anyone in the household. The personal nature of wireless handsets may not satisfy this need. If the phone line is being used to support some data application, such as an alarm system or a medical monitoring device, wireless may not be sufficiently reliable for this purpose. On the other hand, particularly if the wireline service is provided via fiber or coaxial cable where local power is required, wireless may be a better choice during a power outage, at least until the wireless handset's battery runs down. Access to emergency E911 is another area where the performance of these two alternatives differ – fixed wireline E911 is far more reliable in identifying the precise location from where the call to E911 was placed than wireless or even over-the-top nomadic VoIP voice service. Customers who place importance upon the ability to obtain reliable access to E911 might find any substitute for ILEC- or MSO-provided wireline access to be unacceptable.

53. Although the vast majority of high-speed (25/3) broadband is being provided over wireline facilities (hybrid fiber/coaxial cable distribution networks or fiber-to-the-home ("FTTH") services such as Verizon's *FiOS* or Google Fiber), fixed wireless broadband is also available in some areas. An analysis of the Commission's Broadband Availability Database suggests that fixed wireless broadband is available at some 215,102 census blocks and about 4.25-million households statewide – i.e., in census blocks with an average of about 20

households each. However, actual adoption of fixed wireless is still extremely limited, in part because the price levels being charged for this service are typically higher than for wireline broadband. FCC data indicate that, “[w]hile there are fixed broadband services that connect users to the Internet using wireless transmission pathways, such as fixed satellite and fixed wireless service, they are adopted by less than three percent of residential fixed broadband subscribers.[42] Fixed wireless is, however, the only choice where no wireline broadband is available, as is the case in many rural areas. Fixed wireless is likely not a serious rival to cable or ILEC broadband and, at its considerably higher price point, is unlikely to offer any serious competitive challenge to the incumbent cable and LEC providers.

54. It is thus critical, in evaluating the extent to which competition exists for any service, to focus upon all relevant service attributes rather than upon superficial similarities. Even if a large number of customers perceive a service as having acceptable substitutes, for those who do not the incumbent provider can easily exploit its monopoly with respect to the services that these consumers desire. For customers who view certain functions as essential, alternative services that do not support those functions are not competitive alternatives.

42. FCC, *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, 2016 *Broadband Progress Report*, Adopted: January 28, 2016, at para 26, Form 477 Broadband Subscriber Data, as of December 31, 2014.

(6) To be considered a "competitive" or "substitute" service, the service must be provided by an entity other than the provider of the service whose competitive condition is being examined.

55. While it might appear almost self-evident, substitute services that are furnished by the same service provider cannot legitimately be viewed as "competing" with one another absent other non-affiliated competitive sources of supply. ILECs have long pointed to wireless as providing a competitive check on their wireline services even where their own wireless affiliate has had a major presence in the local market.[43] Broadband access may be thought of as a substitute for MVPD service by means of OTT content available for streaming over the Internet. However, if the MVPD and broadband services are furnished by the same ILEC or cable MSO, the provider is in a position to manage the migration between the two services.

56. For example, as an increasingly larger number of cable MVPD customers "cut the cord" and limit their purchases to broadband access only, the MSO can recover some, perhaps most, of its lost revenue by simply increasing broadband rates or by introducing usage-based pricing. This practice is patently evident both in California and nationwide. Sometimes a competing

43. The FCC does not publish wireless market share statistics at the state level. It this data were available, it might reveal the extent to which the wireless affiliate of the incumbent wireline carrier gains a competitive advantage within the ILEC affiliate's geographic footprint. Such data is, however, available for the individual Canadian provinces, and suggests precisely that condition. For example, in the eastern Canadian provinces where the dominant ILEC is either Bell Canada or one of its affiliates, "Bell Group" wireless market shares are in all cases higher than those of the wireless affiliate of Telus, the dominant ILEC serving British Columbia and Alberta. For those two western provinces, Telus' wireless market share is roughly double that of the Bell wireless affiliate. The CRTC report observes that "The incumbent telephone companies that offer wireless services have the largest share of subscribers to wireless services within their respective incumbent operating territory, except in Ontario." Bell wireless share is still 50% larger than that of Telus wireless in Ontario, but the wireless affiliate of Rogers, the dominant cable TV provider in Ontario, is higher than either of the ILEC wireless affiliates' market shares. Canadian Radio-television and Telecommunications Commission, *Communications Monitoring Report, October 2014*, at 216. http://www.crtc.gc.ca/eng/publications1.htm (accessed 8/19/15)

service is furnished by a non-affiliated entity that nonetheless is itself dependent upon the ILEC. CLECs that lease facilities from ILECs may fall into this category. In the end, to be considered a true competing service, the extent of its interdependence vis-a-vis the dominant provider must be incorporated into the analysis.

57. Carriers may in fact engage in a deliberate strategy to migrate customers from one affiliate's service to another. Both Verizon's and AT&T's wireless affiliate offer "wireless home phone" service. Verizon promotes the features of its offering as:

> Wireless Home Phone is a device that allows you to connect your home phone to Verizon's voice network.
>
> You can get a new home phone number or transfer your current one to a Verizon Wireless account*. Then, simply unplug your telephone cord from the wall and plug it into the Wireless Home Phone device.[44]
>
> Wireless Home Phone offers you a reliable, portable, low-cost alternative to traditional home phone service using the Verizon Wireless network, all while keeping your same number and home phone.
>
> But the benefits go beyond that. Wireless Home Phone features Call Waiting, Call Forwarding, 3-Way Calling, Voice Mail, Last-Number Callback, International Calling (with ideal feature or an international calling card) and Caller ID.
>
> And don't worry about having to tell everyone about your new number. When you switch to Wireless Home Phone, you can keep your current number.[45]

AT&T's wireless affiliate offers a similar service:

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44. http://www.verizonwireless.com/home-office-solutions/ (accessed 8/13/15)

45. http://www.verizonwireless.com/home-office-solutions/ (accessed 8/13/15)

> Now there's a low-cost alternative to traditional home phone service. AT&T Wireless Home Phone service uses a mobile device to give you home phone service at a better price."[46]

Both firms market these services to customers within and outside of their respective ILEC operating areas and, by virtue of their ability to set prices and specify service features for both the ILEC and the wireless service, are able to manage the migration so as to maximum corporate level profits.

Conduct

(7) The mere existence of any provider offering similar or substitute services is not by itself sufficient to constrain the market power of the incumbent.

58. As various deregulatory initiatives have emerged from time to time over the past several decades, much of the debate has focused upon how to determine when, and at what level, competition has developed to the point where the need for ongoing regulation is diminished or eliminated. One metric that has been utilized on several occasions is what can best be described as a "mere existence" standard – i.e., the presence of a single competitor may be sufficient to justify regulatory forbearance or other deregulatory measures. A key shortcoming of "mere existence" is that it has generally been applied in the absence of any serious attempt to actually define the relevant product or geographic market, to examine the structural characteristics of the

46. http://www.att.com/cellphones/att/att-wireless-home-phone.html (accessed 8/13/15).

market (e.g., MES), or even to consider empirical evidence that the presence of a single provider has actually operated to constrain incumbents' exercise of market power.

59. While it may appear self-evident that the mere presence of *any* provider of *any* size in a market does not by itself necessarily create a competitive check on the incumbent's market power, in some instances – including both regulatory policy and legislation – the presence of at least one rival provider has been deemed either by legislation and/or by regulators to be fully sufficient to justify some level of deregulation or at least regulatory forbearance with respect to the dominant incumbent. A number of specific examples of this can be cited.

- *Special access*. The FCC has on several occasions adopted so-called "triggers" that, when satisfied, would automatically invoke some sort of deregulatory action. Special access services could be removed from price cap regulation and instead be afforded full "pricing flexibility" once a minimum number of CLEC collocation arrangements had be established at ILEC central offices in a particular geographic area. But the presence of collocations had little or nothing to do with the availability of *competing* special access (usually fiber optic) facilities at any given commercial building (so-called "lit buildings"). Thus, the trigger was applied without regard to the effect, if any, of such competing facilities in constraining ILEC special access prices, which actually experienced far greater increases under "pricing flexibility" than when subject to price cap rate limits.

- *Cable TV*. In enacting the *Cable Television Consumer Protection and Competition Act of 1992* ("1992 Cable Act"),[47] "Congress adopted a 'preference for competition,' pursuant to which a franchising authority may regulate basic cable service tier rates and equipment only if the [Federal Communications] Commission finds that the cable system is not subject to Effective Competition."[48] The FCC had initially implemented the *1992 Cable Act* by adopting a rebuttable presumption that "[i]n the absence of a demonstration to the contrary, cable [TV] systems are presumed not to be subject to effective competition ..."[49] unless certain conditions are satisfied. A cable system that is deemed to be "subject to effective competition" is not subject to any rate regulation under 47 U.S.C. §623. 47 U.S.C. §623(l)(1) defines several threshold conditions for determining that "effective competition" with respect to multichannel video program distribution ("MVPD," i.e., cable TV) services exists, including:

> (A) fewer than 30 percent of the households in the franchise area subscribe to the cable service of a cable system;
>
> (B) the franchise area is -

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47. *Cable Television Consumer Protection and Competition Act of 1992*, Pub. L. No. 102-385, 106 Stat. 1460 (1992); 47 U.S.C. § 543(a)(2)(A).

48. *Amendment to the Commission's Rules Concerning Effective Competition; Implementation of Section 111 of the STELA Reauthorization Act*, MB Docket No. 15-53, *Report and Order* Adopted: June 2, 2015; Released: June 3, 2015, FCC 15-62 ("*Effective Cable TV Competition Order*"), at para. 1.

49. FCC Media Bureau, *I/M/O Petition of the City of Boston, Massachusetts, For Recertification to Regulate the Basic Cable Service Rates of Comcast Cable Communications, LLC*, CSR 8488-R, *Memorandum Opinion and Order*, Rel. April 9, 2012, at para. 2.

> (I) served by at least two unaffiliated multichannel video programming distributors each of which offers comparable video programming to at least 50 percent of the households in the franchise area; and
>
> (ii) the number of households subscribing to programming services offered by multichannel video programming distributors other than the largest multichannel video programming distributor exceeds 15 percent of the households in the franchise area;

Thus, to qualify for deregulation of rates, only one (other than the incumbent) provider must *pass* (not necessarily serve) only 50% of all households and meet the subscriber thresholds listed above; even if the remaining households are passed by only the incumbent, the exemption from rate regulation applies throughout the cable operator's local service area. There is no actual market test for the effectiveness of the putative competitor(s) in constraining cable TV rate levels which, absent rate regulation, have been experiencing rate increases that far outpace those applicable for most other telecom services or inflation generally. In 2015, the FCC reversed the "rebuttable presumption" of "no effective competition" to that of "effective competition," while maintaining the same "two-pronged test for a finding of Competing Provider Effective Competition requires that (1) the franchise area is 'served by at least two unaffiliated [MVPDs] each of which offers comparable video programming to at least 50 percent of the households in the franchise area;' and (2) 'the number of households subscribing to programming services offered by [MVPDs] other than the largest [MVPD] exceeds 15 percent of the households in the franchise area.'"[50]

50. *Effective Cable TV Competition Order*, at para. 6.

- *Long distance reentry*. Sec. 271 of the *Telecommunications Act of 1996*, which set out the conditions for long distance service reentry by Bell Operating Companies required that only a single *facilities-based* provider of "telephone exchange service" be present in the market, where such "telephone exchange service may be offered by such competing providers either exclusively over their own telephone exchange service facilities or predominantly over their own telephone exchange service facilities in combination with the resale of the telecommunications services of another carrier." Sec. 271(c)(1)(A). The actual geographic scope of the area served by this competing facilities-based provider of telephone exchange service did not matter.

60. The problem here is that no actual demonstration of the true "effectiveness" of any competitor in constraining the market power and price level of the dominant incumbent is considered. As experience with broadband prices has amply demonstrated, the presence of a single rival – especially one that serves less than all of the designated geographic market area – is simply insufficient to constrain prices. Thus, a more robust and multifaceted analysis framework, such as that described here, will need to be established. Within the "conduct" element of the S-C-P paradigm, price and earnings comparisons of firms and markets where different levels of competition are present can be examined. Markets in which prices have experienced persistent increases, increases that far exceed economywide inflation rates, should be viewed as presumptively noncompetitive absent some affirmative showing to the contrary.

61. There is, in fact, considerable empirical evidence, evidence compiled by the FCC itself, that directly undermines the "one competitor is sufficient" theory as a basis for the elimination of rate regulation. §623(k) of the 1992 *Cable Television Consumer Protection and Competition Act of 1992* ("Cable Act"), requires the FCC to publish annually a statistical report on the average rates that cable operators charge for "basic cable service, other cable programming," and cable equipment.[51] The FCC implemented this requirement at MM Docket No. 92-266. The most recent "Report on Cable Industry Prices" was issued in May 2014.[52] In addition to tracking year-over-year changes in Basic Cable and the first tier of premium channels ("Expanded Basic"), the Report also separately tracks price changes in cable operators that the FCC had determined confront "effective competition" based upon the 47 U.S.C. §623(l)(1) criteria discussed above, vs. those cable operators that do not have an FCC finding of effective competition, which the Report characterizes as "noncompetitive." Operators classified as "noncompetitive" are subject to local franchise authority regulation of basic cable service rates, whereas those found to confront effective competition are exempt from such rate regulation. The principal findings of the Report include the following:

- The average monthly price of expanded basic service (the combined price of basic service and the most subscribed cable programming service tier excluding taxes, fees and equipment charges) for all communities surveyed increased by 5.1 percent over the 12 months ending January 1, 2013, to $64.41, compared to an annual increase of 1.6 percent in the Consumer Price Index (CPI). The price of expanded basic service has increased at a compound average

51. Pub. L. No. 102-385, 106 Stat. 1460, codified at 47 U.S.C. §543(k).

52. *Implementation of Section 3 of the Cable Television Consumer Protection and Competition Act of 1992, Statistical Report on Average Rates for Basic Service, Cable Programming Service, and Equipment*, MM Docket No. 92-266, *Report on Cable Industry Prices*, Adopted: May 16, 2014; Rel. May 16, 2014, DA 14-672.

annual growth rate of 6.1 percent during the period 1995-2013. The CPI increased at a compound average annual growth rate of 2.4 percent over the same period.[53]

- Over the 12 months ending January 1, 2013, the average price of expanded basic service increased by 4.6 percent, to $63.03, for those operators serving communities for which no effective competition finding was made as of January 1, 2013. For the effective competition communities, the average price of expanded basic increased by 5.8 percent, to $66.14.[54] ... The difference is statistically significant.[55]

- The three previous surveys also found that the price of expanded basic service in effective competition communities was higher than the price of expanded basic in communities without such a finding. Prior to that, surveys found that effective competition communities in general had lower prices.[56]

- [A]s of January 1, 2013, the average [customer premises] equipment ["CPE"] price was $7.55 with basic service, $7.70 with expanded basic service, and $8.40 with the next most popular service package. Most equipment prices increased on an annual basis. Increases in the overall price for the most commonly leased equipment ranged from 4.4 percent for basic service, to 4.2 percent for expanded basic, to 3.9 percent for the next most popular service.[57]

- CPE prices were found to be higher for operators that the FCC had found were subject to effective competition than for those considered "noncompetitive" (see Table 5).

53. *Id.*, at para. 3.

54. *Id.*, at para. 4.

55. *Id.*, at para. 5.

56. *Id.*, footnote references omitted.

57. *Id.*, at para. 22, footnote references omitted.

Table 5

AVERAGE MONTHLY CPE RENTAL PRICES FOR "NONCOMPETITIVE" AND "EFFECTIVE COMPETITION" CABLE TV OPERATORS (as of January 1, 2013)

Cable programming service	Noncompetitive	Effective Competition
Basic Cable Service	$ 7.16	$ 7.94
Annual change	+ 2.7%	+ 6.2%
Expanded Basic	$ 7.37	$ 8.04
Annual change	+ 2.8%	+ 5.7%
Next Most Popular Tier	$ 8.07	$ 8.77
Annual change	+ 3.2%	+ 4.7%

Source: FCC 2014 Report on Cable Industry Prices, at Table 7.

Thus, for markets that have been deregulated (because they had been deemed "subject to competition" under the minimal standards established by the 1992 legislation), prices have risen by larger amounts than for markets that remain subject to rate regulation. These results confirm that, contrary to the "one competitor is sufficient" standard for a finding of "effective competition," the presence of only one, or perhaps even more than one (if satellite TV services are included) provider does not produce sufficient competition to constrain rates to competitive levels. Indeed, the pattern of CPE price increases is particularly revealing: It might be argued that one reason why cable TV rates are rising faster than economywide inflation is attributable to escalating content costs. Perhaps. But costs – and prices – of consumer electronics have been dropping precipitously over the past decade, yet the *rental* prices for CPE provided by cable TV and satellite TV operators have been rising at more than double the US inflation rate. Indeed, CPE rentals are a major source of cable industry profits,[58] and most consumers are unaware that many of the broadband gateway/router and some set-top box devices can be purchased from sources other than the cable TV operator – and at considerable savings.[59]

62. The effectiveness of a single competitor can also be a good starting point for the consideration of what constitutes the correct product market for a competitive analysis. As in the example above regarding Special Access Services, the relevant product market for this type of service may very well be at the individual building level, and is almost certainly not so large as an Major Trading Area ("MTA"), county, or even city level. In contrast, the availability of switched access services that provide end-user-to-interexchange carrier connectivity to any long distance carrier in a Local Access and Transport Area ("LATA") established the LATA as the relevant geographic market for competing long distance service providers.

(8) ***Effective competition requires more than two incumbent providers***

63. The effects of varying levels of MES and market concentration upon price levels can be examined by comparing telecommunications markets with only one or two incumbent providers with those where multiple providers are present. A comparison of pricing conduct as between

58. See, e.g., FCC Chairman Tom Wheeler, "It's Time to Unlock the Set-Top Box Market" *Re/code*, January 27, 2016, available at http://recode.net/2016/01/27/its-time-to-unlock-the-set-top-box-market/ (accessed 03/09/16).; "Set-top box revenue grows to record $20 billion," *Los Angeles Times*, March 9, 2016, available at http://www.latimes.com/business/technology/la-fi-tn-set-top-box-sales-20140716-story.html (accessed 03/09/16).

59. For example, Comcast charges $8 to $10 per month for a wireless broadband gateway, which combines the cable modem and wireless router functions. Equivalent devices can be purchased for about $80 or less, the equivalent of about 8-10 months rental.

the mobile wireless (CMRS) market and the high-speed broadband Internet access market provides a good source of such experience.

64. There was virtually no price competition between the "A" and "B" block carriers under the duopoly arrangement, and the two wireless carriers resisted the requirement to offer wholesale services for resale, and so stand-alone retail-level competition was minimal. However, once the number of incumbents grew to four or more, price competition developed, and carriers sought out resellers and began aggressively to encourage retail-level competition through so-called "Mobile Virtual Network Operator" ("MVNO") arrangements. The mid-2000s saw some consolidation of CMRS providers, but with four national carriers and more regional competitors, price competition persisted. Over the next decade-plus, disruptive competitors such as T-Mobile and Metro PCS introduced a variety of new pricing arrangements and forced a precipitous drop in wireless prices overall, as well as the introduction of new services – an evolution that is still underway.

65. Perhaps observing the significant improvement in market performance that arose after the CMRS market evolved from two to, eventually, four incumbents, the FCC has stated its reluctance to allow the number of firms to drop below four. In support of its conclusion that the proposed 2011 AT&T/T-Mobile merger would create the potential for serious competitive harms, the FCC Staff addressed the consequences of reducing the number of national facilities-based wireless carriers from four to three:

> 75. Coordinated effects are of particular concern here because the retail mobile wireless services market, being relatively concentrated and hard to enter, appears conducive to coordination. In addition, T-Mobile plays a disruptive role in this market to the benefit of buyers, and, thus, likely constrains coordination. An acquisition eliminating a disruptive firm in markets vulnerable to coordinated conduct is likely to cause adverse coordinated effects.
>
> 76. The retail mobile wireless services market would be more vulnerable to coordination post-transaction. Features of this market make it likely that the remaining three nationwide providers would be able to reach a consensus on the terms of coordination (by identifying a mutually agreeable coordinated price), deter cheating on that consensus (by undercutting the coordinated price to steal high-margin business from its rivals), and prevent new competition in this market. Because these providers offer the same plans and charge the same prices nationwide, increased coordination would most likely take the form of raising the level of prices.
>
> 77. Reaching a consensus would be facilitated by the small number of firms and the use of national prices and service plan offerings by most providers across most geographic markets. ...[60]

Notwithstanding the less-than-enthusiastic reception that the FCC afforded the idea of an AT&T/T-Mobile combination, in 2014 Sprint initiated discussions to acquire T-Mobile for a purported $32-billion, but later abandoned the effort. Following the announcement by Sprint that it would not longer pursue a deal with T-Mobile,[61] FCC Chairman Tom Wheeler issued the following statement: "Four national wireless providers are good for American consumers. Sprint now has an opportunity to focus their efforts on robust competition."[62] While there is no

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60. *Applications of AT&T Inc. and Deutsche Telekom AG for Consent to Assign or Transfer Control of Licenses and Authorizations*, FCC WT Docket No. 11-65, FCC Staff Analysis and Findings, November 30, 2011, at paras. 75-77, footnote references omitted.

61. "Sprint Abandons Pursuit of T-Mobile, Replaces CEO," *Wall Street Journal*, August 5, 2014, http://www.wsj.com/articles/sprint-abandoning-pursuit-of-t-mobile-1407279448 (accessed 8/19/15)

62. Statement by FCC Chairman Tom Wheeler on Competition in the Mobile Marketplace, August 6, 2014. https://www.fcc.gov/document/chairman-wheeler-statement-competition-mobile-marketplace (accessed 8/19/15).

question that the wireless market is more competitive than the market for wireline broadband access, its highly concentrated condition still produces monopolistic conduct, as is evident in the universal adoption by all four national CMRS carriers of certain customer service agreement terms and conditions that would be far more difficult to enforce industry-wide under truly competitive conditions. These include, among other things, limitations on liability, mandatory arbitration and class action waiver provisions.

66. The FCC's 2010 *National Broadband Plan* determined that "An initial universalization target of 4 Mbps of actual download speed and 1 Mbps of actual upload speed, with an acceptable quality of service for interactive applications, would ensure universal access."[63] But in stark contrast to the relatively competitive conditions extant in the wireless market, FCC data suggests that as of 2010, for residential broadband access at (by today's standards) these modest speed levels, only about 4% of all US households had a choice of three or more providers; 78% had a choice of two providers, and the remaining 18% had either no service at all (5%) or only one provider (13%).[64] Not surprisingly, and as shown in Figure 7, cable and broadband prices have been steadily increasing, while wireless prices have been dropping rapidly.

63. FCC, *Connecting America: The National Broadband Plan*, March 17, 2010 ("*National Broadband Plan*"), at 135.

64. *Id.*, at 37.

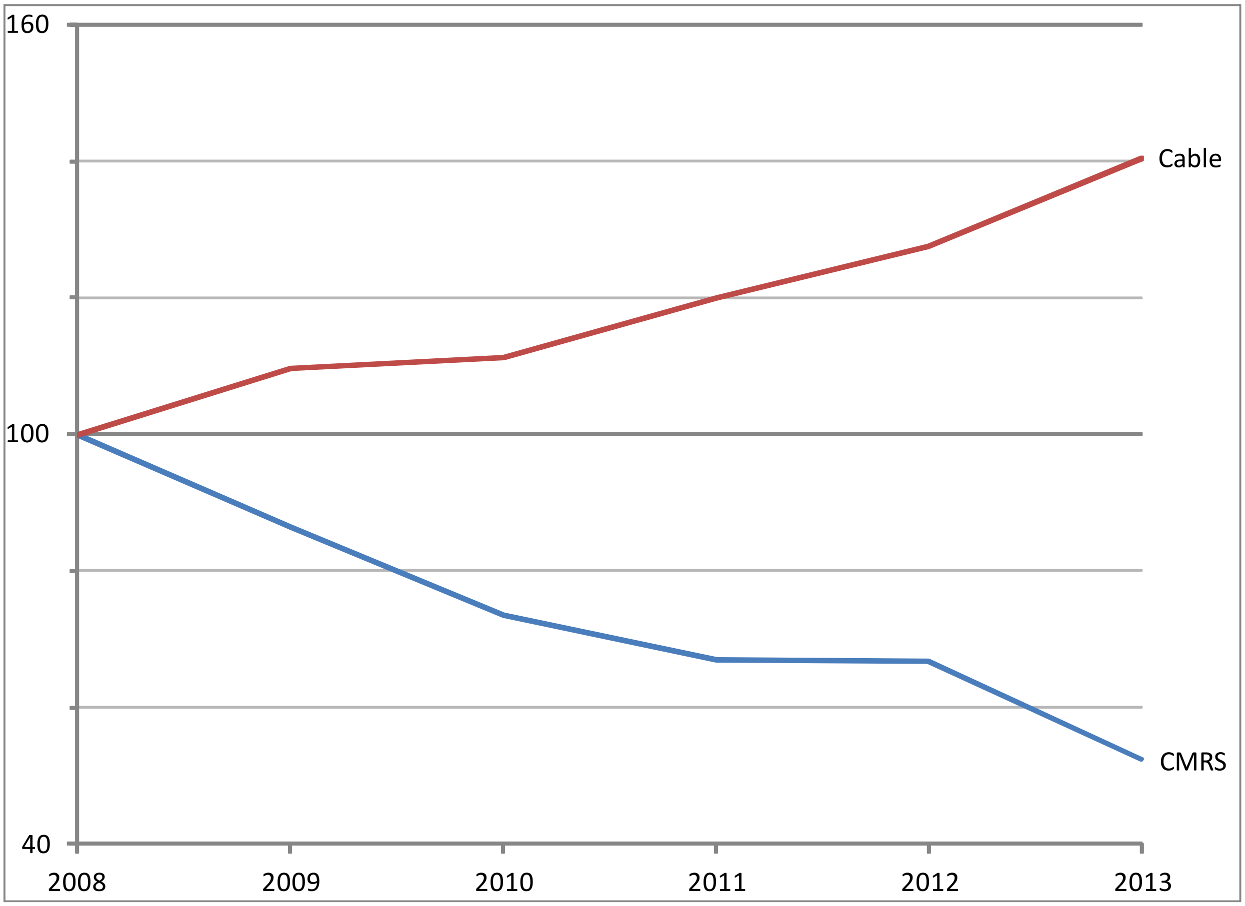

Figure 7. Prices for wireless voice and data services have been steadily decreasing, while Basic Cable prices have steadily risen. Index (2008=100) of Basic Cable average service price and Average Revenue per Mixed Unit for CMRS. Sources: FCC Cable Report; CTIA Semi-Annual Wireless Industry Survey, year end 2013.

67. As a policy matter, it is simply incorrect to view a telecommunications market with only two principal rivals as being sufficiently competitive to justify the elimination of rate regulation and, indeed, state PUCs retained jurisdiction with respect to wireless rates until adoption of the same 1993 federal legislation that authorized the FCC to issue licenses through auctions. While the regulatory scheme adopted in the *Telecommunications Act of 1996* – regulation of wholesale

rates while facilitating unbundled nondiscriminatory access to the network providers' facilities by nonregulated downstream retail competitors – seems now to be out of favor (as exemplified by the FCC's refusal to apply it even when it reclassified broadband access as a Title II common carrier service),[65] the post-*Telecommunications Act of 1996* regulatory model spawned substantial local service competition at a time when any competing facilities-based entry was not economically feasible. Even today, there are still only two primary competitors in the local wireline voice telecom market (ILEC and cable), neither one of which offers, or is required to offer, cost-based wholesale platform access to their underlying network services.

(9) Persistently excessive earnings levels of the dominant firm or firms are an indication of a lack of effective competition.

68. Persistently excessive profit levels on the part of market incumbents are an indication of market failure notwithstanding the nominal presence of rival providers. If a market is capable of supporting multiple providers, then the presence of persistently excessive profit levels would be expected to induce entry. Competitors would be expected to bid prices down toward cost-based levels – i.e., to levels that eliminate most, if not all, excess (monopoly) profits. This cannot occur, however, if competition is blocked or retarded due to the presence of barriers to entry, actual or contrived. A small firm may confront economic barriers to entry where its relatively small scale of operations is simply less efficient than that of its rivals, or where it is unable to

65. *Protecting and Promoting the Open Internet*, FCC GN Docket No. 14-28, *Report and Order on Remand, Declaratory Ruling, and Order*, Adopted: Feb. 26, 2015; Rel: March 12, 2015, FCC 15-24 ("Open Internet Order"), at paras. 50 *et seq.*

achieve the "minimum efficient scale" of operations or, as in the case of the telecommunications industry, where large sums of "sunk" capital investment are involved.

69. Entry barriers may be artificially imposed by the incumbent provider, for example, by blocking the entrants' access to essential inputs or by forcing entrants to pay higher prices for such inputs than those available to the incumbent. Where the incumbent is itself vertically integrated such that it controls the supply of inputs essential for its rivals' operations, it can readily erect major entry barriers unless prevented from so doing through regulation or other government intervention (e.g., an antitrust action).

70. If entry is effectively blocked or otherwise constrained, the incumbent will be able to maintain excessive, so-called *supracompetitive* prices and profit levels indefinitely. Thus, even in a market that is not subject to cost-based ratesetting as a result of an affirmative decision on the part of the regulatory agency to forbear from applying rate regulation, regulators with ratemaking authority can still require that dominant firms subject to their jurisdiction provide detailed financial reports separately for each market segment in which they operate.[66]

71. Price benchmarking may offer another Conduct metric. As discussed above, a comparison of wireless to broadband prices over the past decade or so indicates a striking disparity – wireless prices have been dropping while broadband prices have been on the rise.

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66. Segment-level reports are necessary because a consolidated company-wide report may conceal the presence of excessive profit levels in some segments that are then used to effectively cross-subsidize operations in more competitive segments.

These are, of course, different markets with different cost conditions, but other than the obvious differences in market structure and concentration, it's not altogether clear why this large disparity in price movements should have occurred. Benchmarking can also be made with respect to the service provider's inputs, comparing changes in input and output prices over time. With the exception of labor, the costs of most broadband service inputs (e.g., electronics, fiber optics, CPE) have been declining, while output prices (broadband access rates) have been rising. Whether a "comparables" benchmark or an "input" benchmark is used, persistent deviations in the firm's output prices from those benchmarks can be used to trigger affirmative regulatory intervention.

72. Profit levels of telecommunications providers can also be compared across firms in other industries exhibiting different competitive and market concentration attributes. For example, earnings levels of telecommunications providers can be compared with those of comparably-sized publicly-traded companies, for example, that make up the S&P 500 Index. Profit levels of telecommunications firms can also be examined over time, covering pre- and post-deregulation periods. If persistently excessive profit levels are observed for telecom firms no longer subject to price or earnings regulation, it is reasonable to conclude that effective competition is not present in such markets.

73. In complex corporate organizational structures (Verizon, for example, has more than 400 affiliates and subsidiaries, domestic and foreign), there is a strong potential for *misallocation* of costs that are common to multiple entities and for cross-subsidization of relatively competitive

business activities with excess profits earned in more monopolistic markets. If a cost reporting requirement is limited solely to a single regulated entity, creative cost accounting and cost allocation techniques can shift costs to the regulated affiliate, thereby understating its actual earnings and revenue/cost relationships. Affiliate transactions of this type have been the subject of extensive regulatory attention under traditional Rate of Return-type cost-of-service regulation.

(10) Pecuniary differences in the treatment of rival services can distort competitive markets and produce inefficient results.

74. Regulatory changes occur in spurts, and often affect rival services in different ways. Sometimes a service may obtain a competitive advantage vis-a-vis another service merely as a result of a difference in regulatory treatment. Where such conditions exist, marketplace forces may fail to accurately sort out the most efficient alternatives.

75. For example, prior to the 1984 break-up of the former Bell System, long distance calls furnished by AT&T were priced so as to flow a large portion of their revenues to subsidize basic local residential exchange service. However, competing long distance services were not at that time being required to provide such subsidies, affording the entrants a significant cost advantage relative to AT&T. In 1984, immediately following the Bell break-up, the FCC established a system of “switched access charges” whereby interexchange carriers (IXCs) including AT&T as well as newcomers MCI and Sprint were required to purchase and pay for “switched access” connections to the originating and terminating local telephone companies at rate levels that, once “equal access” and dialing parity was implemented in a wire center, were expressly intended to

replace a substantial portion of the pre-breakup subsidies. That system has persisted almost to the present day, although most of the revenue that had been derived from usage-based switched access charges has been shifted to monthly end user fees. But when over-the-top VoIP long distance services were introduced in the mid-2000s, similar access charges did not always apply, such that the interconnection cost for a VoIP call was often well below that for a traditional circuit-switched IXC call. Similarly, wireless carriers were not subject to access charges at the wireless end of a long distance call, a condition that enabled them to offer "nationwide" calling plans that helped to stimulate migration from wireline to wireless. That differential has by now been largely phased out, but when it existed it had the effect of enabling VoIP and wireless providers to offer long distance calling services at much lower price levels than the traditional IXCs.

76. There may be good cause for maintaining these regulatory differentials in certain situations, such as to encourage the development of a nascent market. However, if and to the extent that such differentials are present, they must be identified and incorporated into the competitive assessment, which must include an evaluation of the extent to which the perceived competition could survive absent the different regulatory treatments.

(11) Competitor dependence upon "essential" inputs from an upstream provider with substantial market power can undermine the effectiveness of competition, especially if the upstream provider is itself involved in the same downstream market.

77. In order to produce its products or services, a firm of any type must purchase some number of different inputs – e.g., materials, equipment, energy, rights to proprietary licenses and

content, etc. – from a variety of external ("upstream") sources, combine those inputs in its various production processes, and through those processes and its own resources convert the inputs into its outputs. These may be final end-user products or services, or intermediate goods that are furnished to downstream companies for further conversion and processing into those firms' outputs. The "value added" by a firm is the difference between what it pays in aggregate for the inputs it purchases from other non-affiliated sources and the aggregate revenues it receives from the sales of its outputs. Labor, technology, and any other elements of the production process that are produced by the firm itself are part of its overall value-added.

78. In competitive markets, firms seek to gain a competitive advantage by adopting more efficient production or distribution processes than their rivals, by offering products or services possessing unique features or other attributes not available from rival products, by acquiring their various inputs at lower cost than rivals, by obtaining inputs offering higher quality or functionality than those being used by their rivals, among other things. If the upstream market for the firm's inputs is itself subject to effective competition, the firm can negotiate with multiple suppliers and thereby shop for the best deal.

79. However, where the upstream input market is not competitive – if, in the extreme case, it is controlled by a single monopolist – then all of the downstream competitors must ultimately turn to that same common source for this "essential" input, paying economic rents to the monopolist and limiting possible competition. Where the upstream input is critical to the downstream firm's production – i.e., where the input is an "essential" product or service – the

monopoly provider is in a position to dictate prices and terms to all downstream purchasers, and potentially to capture as economic rent most or even all of the economic profit that might otherwise be available to downstream value-added providers. The larger the portion of the total final product price that is being paid over to the monopoly upstream provider, the fewer opportunities for any real downstream competitive activity become.

(12) Persistent refusal on the part of a facilities-based service provider to deal with downstream entities is itself compelling evidence of that provider's market power.

80. Where the upstream provider is itself also engaged in the same downstream final product market, it confronts the additional incentive to leverage its upstream market power to frustrate or foreclose entry in the downstream markets by charging excessive prices, by restricting or even denying access to the essential input that it controls, or other similar tactics. The US telecommunications industry is replete with instances where a facilities-based network entity would refuse to offer its core infrastructure-based services to downstream firms that wished to compete with its own downstream final product market. If a facilities-based provider confronts actual competition, it would have no financial incentive to withhold its services or access to its facilities from use by downstream competitors since, were it to do so, those entities would simply acquire their essential inputs elsewhere.

81. There are now four major national facilities-based wireless providers in the US, and all four regularly offer their services at wholesale to resellers who rebrand them and use them to compete at the retail level. Yet ILECs and, more recently, cable television MSOs, have

steadfastly resisted such efforts, and have engaged in protracted litigation and in regulatory/ legislative efforts to forestall any requirement that they do so.[67] "Refusal to deal" tactics of this sort could not be sustained in an effectively competitive facilities-based market; its persistence in the case of most last-mile wireline service providers (ILECs and cablecos) is compelling evidence that even where two "last mile" wireline providers are present, effective competition between them remains elusive.

(13) Control of infrastructure creates incentives and opportunities for dominance of downstream and adjacent product markets.

82. An incumbent firm that has effective monopoly control or market dominance with respect to underlying infrastructure is in a position to extend that control into downstream (vertical) markets as well as into adjacent (horizontal) markets unless it is prevented from doing so through either structural separation or requirements that it provide rivals with nondiscriminatory access to underlying network elements. Vertically-integrated firms that compete in downstream markets but which maintain market power in upstream markets may limit downstream competition through their control of wholesale inputs used by downstream rivals. If wholesale input markets of this sort are no longer subject to price regulation of any sort, the result will be reduced competition in the downstream retail market. For example, prior to the

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67. See, e.g., *Inquiry Concerning High-Speed Access to the Internet over Cable and Other Facilities, Declaratory Ruling and Notice of Proposed Rulemaking*, 17 F.C.C.R. 4798 (2002) (*Cable Modem Declaratory Ruling*), *aff'd sub nom. Nat'l Cable & Telecomm. Ass'n v. Brand X Internet Servs.*, 545 U.S. 967 (2005); *Appropriate Framework for Broadband Access to the Internet over Wireline Facils.*, *Report and Order and Notice of Proposed Rulemaking*, 20 F.C.C.R. 14853 (2005) (*BWIA Order*); *Verizon v. FCC*, DC Circuit No. 11-1355 (2014).

2004 *USTA II* ruling[68] and the FCC's Broadband Wireline Internet Access ("BWIA") decision,[69] ILECs were generally required to provide DSL on a wholesale stand-alone basis to downstream retail service providers. But when that requirement was eliminated, these wholesale services ceased to be made available, and competition at the retail level largely disappeared. The FCC's *Cable Modem Order*[70] and the Supreme Court's *Brand X* ruling effectively exempted cable MSOs from any requirement that they make broadband access available on a wholesale basis to downstream retail providers. They have never voluntarily done so and, as a result, retail competition for cable-based broadband is nonexistent. Absent such measures, downstream and adjacent *potentially competitive* activities of such firms cannot be deemed to be constrained by marketplace forces *even in the presence of nominal competition in the downstream and adjacent markets*.

83. *Vertical integration effects*. The traditional concept of a "common carrier" is a transport entity that takes on freight, passengers or traffic (more generally, "content") at one location and safely delivers it to another location without modification. If the common carrier is not in itself engaged in the production and/or sale of the freight, passengers or traffic that it carries, it should be largely indifferent (except with respect to matters involving safety and legality) as to what and which suppliers' items are transported over its facilities. However, as soon as the common

68. *United States Telecom Association v. FCC*, 359 F.3d 554 (D.C. Cir. 2004)("*USTA II*").

69. *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Report and Order and Notice of Proposed Rulemaking*, 20 F.C.C.R. 14853 (2005) ("BWIA Order").

70. *Inquiry Concerning High-Speed Access to the Internet over Cable and Other Facilities, Declaratory Ruling and Notice of Proposed Rulemaking*, 17 F.C.C.R. 4798 (2002), *aff'd sub nom. Nat'l Cable & Telecomm. Ass'n v. Brand X Internet Servs.*, 545 U.S. 967 (2005).

carrier is also engaged in the "content" business in some manner, that indifference disappears, and the carrier now has an incentive to favor its own "content" over that provided by rival producers. The production of infrastructure-based transport services may exhibit a relatively high MES, but the production, distribution and sale of individual commodities being carried thereon likely exhibits a far lower MES. Hence, it is entirely possible that effective and viable competition can develop in these adjacent markets without compromising the efficiency of the infrastructure segment. That principle is embodied in the 1984 AT&T Consent Decree as well as in TA96 – i.e., both include mechanisms designed to de-link infrastructure from downstream markets by assuring that downstream providers have the same or fully equivalent access to the underlying transport infrastructure. The structural separation of the Bell local exchange carriers from the adjacent long distance, CPE, information services, and equipment manufacturing as required by the1984 Consent Decree excluded the infrastructure-based entities from participation in these markets. TA96 eliminated those outright prohibitions, but imposed nondiscriminatory access and unbundling requirements.

84. Unlike the telephone common carriers, MVPD providers have historically been allowed to integrate downstream content distribution into the core transport service. They have also not been required to offer access to their underlying video and broadband transport facilities to downstream rivals, and have thus far successfully resisted legal challenges aimed at opening their networks to rival downstream providers.[71] This has permitted them to leverage the infrastructure monopoly both upstream (into content producer markets) and downstream (into

71. See, e.g., *Nat'l Cable &Telecomm. Ass'n v. Brand X Internet Servs.*, 545 US 967 (2005) ("*Brand X*").

content distribution markets). It has also permitted them to erect barriers to entry even in the absence of actual content ownership (as in the case of TWC's exclusive arrangement with the LA Dodgers) whose effect (and perhaps intent) is to limit rivals' access to such content and in so doing disadvantage them competitively.[72] And it has also allowed them to exercise monopsony market power over upstream content purchases. The presence of such structural conditions undermines many claims of effective competition, unless strict controls are put in place.

85. The advent of streaming video over broadband Internet access has the potential to limit the MVPD provider's market power with respect to upstream content, by permitting the content provider to market its services directly to the end user. However, since the end user's underlying broadband access is usually furnished by the same MVPD (cable or ILEC) provider, the latter will still be in a position to limit its end user customers' choices as to content sources. The FCC's *Open Internet Order* addresses this concern to a certain extent, by prohibiting the broadband access provider from discriminating against rival content by, for example, subjecting it to speed throttling and similar tactics. However, as long as the broadband provider is not

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72. TWC has exclusive rights for local distribution of Los Angeles Dodgers games on behalf of SportsNet LA, an entity created by the Dodgers ownership. TWC customers have access to Dodgers games over their (TWC) cable service, but in order for customers of other video services with which TWC directly competes (e.g., DirecTV, Dish Network, AT&T U-Verse) to view Dodgers games, their video service must negotiate an agreement with TWC. TWC has offered such agreements, but at prices that the other video providers view as exorbitant, and have refused to pay. As a result, with the exception of TWC cable subscribers, Dodgers games have been blacked out for the majority of the Los Angeles market. The tactic has operated to severely disadvantage TWC's competitors either by increasing their costs (if they agree to pay the price being asked) or by degrading their service (by preventing their customers from watching Dodgers games). "Small pay-TV provider feels squeeze play over Dodgers channel", Jun. 9, 2014, http://www.latimes.com/business/lafilazarus20140610column.html; "Charter to Launch Timer Warner Cable SportsNet LA on June 9th", http://www.sportsnetla.com/charter; "Bright House Networks to Launch Time Warner Cable SPORTSNET LA", https://brighthouse.com/about/about-us/newsroom/2014/bright-house-networks-to-launch-time-warner-cable-sportsnet-la.html (accessed 1/13/16).

subject to any form of price regulation, it will still possess the ability to extract economic rents from end users who elect to purchase rival content. It can, for example, increase the price of broadband access so as to capture lost profits from so-called "cord-cutter" purchases of rival content, or perhaps replace the current unlimited broadband access pricing model with a usage-based or block-of-time pricing scheme similar to that which is currently being used by most wireless providers with respect to their data services.

86. *Horizontal effects*. Dominance in an infrastructure-dependent segment (with or without extensions upstream and downstream) can also be leveraged horizontally into adjacent markets in which the infrastructure owner has an economic interest. For example, a wireline LEC that is also in the wireless CMRS business is in a position to offer "bundles" of wireline and wireless services at prices that a wireless-only rival may not be able to replicate. An MVPD operator that is in a position to offer exclusive content (e.g., LA Dodgers games) can leverage that market position into adjacent local telephone service markets, as well as other potentially competitive content markets.

87. Last year, NBCUniversal announced that it will not run advertisements for Dish Network's over-the-top (OTT) Sling TV service on its NBC-owned and operated broadcast TV stations in San Francisco, San Diego, New York and Washington D.C.[73] It is not difficult to imagine that NBCUniversal's Comcast affiliate could adopt a similar policy across all of its

73. "Comcast-Owned NBC Blocks Sling TV Ads," SlingTV Announcement, July 30, 2015, available at http://blog.sling.com/announcements/comcast-owned-nbc-blocks-sling-tv-ads/ (accessed 3/9/16)

cable TV markets. In short, the assessment as to the potential for effective competition in any given market segment requires that all vertical and horizontal opportunities be analyzed and considered.

(14) High switching costs present a significant barrier to entry and competition.

88. Another source of a significant barrier to entry can be found in so-called "switching costs" – the cost that a customer would be required to incur in order to switch from his or her current service provider to a competitor. Switching costs sometimes involve physical changes in a service arrangement. For example, to switch from a DSL to a cable-based service, the customer would need to replace a DSL modem with a cable modem and telephone wiring with coaxial cable. Some wireless carriers (e.g., Verizon and Sprint) utilize a wireless transmission protocol known as CDMA, whereas others (e.g., AT&T, T-Mobile) utilize GSM. CDMA handsets are generally not compatible with GSM systems, and vice versa. Thus, to switch between carriers that utilize different protocols, the customer would be required to get a new handset. Providers seeking to attract new customers away from their existing service will often seek to minimize such switching costs by offering the CPE on a rental basis for a few dollars per month, performing on an-site installation at a modest or zero cost, and by offering handset subsidies. Several CMRS providers have even begun offering to pay customers' existing carrier early termination penalties if they agree to switch to the new provider.

89. Where service providers seeking to attract new customers will often take steps to minimize those potential customers' switching costs, providers desiring to retain their existing

customers will often try to do just the opposite – i.e., they will adopt measures whose effect is to *increase* the switching costs confronting their existing customers. Wireless carriers have traditionally imposed various types of artificially-created switching costs, such as by requiring that customers enter into term contracts with early cancellation penalties. This tactic has the effect of locking a customer into a carrier until the contract term has been completed, effectively making the customer non-addressable to competitors. Similar practices have been employed by satellite TV providers, home burglar/fire alarm companies, and by MVPD and broadband Internet access providers.

90. Wireless carriers also impose another switching cost that makes it difficult for a customer to switch carriers even when both utilize the same transmission protocol. This is accomplished by including a "software lock" in the wireless handset, which prevents its activation on a carrier other than the one from which the handset had been obtained. In order to activate the handset on a competing CMRS carrier, the customer must first obtain an "unlock" code for the phone from the issuing carrier. Recent class action lawsuits and FCC actions now generally require that carriers offer to unlock customers' handsets without charge upon fulfillment of their contract term.[74] In response to customer complaints and market pressures, several major CMRS providers have eliminated term contracts and "subsidized" handsets, replacing them with extended term financing plans under which the customer makes monthly payments for the handset over a fixed period of time, at which point the handset-related payments cease, and the carrier will unlock the unit, but only upon request, at no charge.

74. https://www.fcc.gov/encyclopedia/cell-phone-unlocking (accessed 8/14/15)

91. The use of term contracts has also become more prevalent for broadband and cable services, particularly where there is some CPE involved (such as a Digital Video Recorder (DVR) or an up-front cash reward for signing up). These arrangements tend to undermine competition by removing customers from addressability by rivals until their term is fulfilled and the potential for a penalty is eliminated. Where the competitor offers to pay the customer's penalty so as to reduce switching cost (as several CMRS carriers are now doing), the competitor's customer acquisition costs are increased, perhaps substantially. Switching costs – particularly those that are artificially created – are far more easily imposed and enforced in highly concentrated markets than in robustly competitive markets. In that regard, their use in the wireless area has diminished somewhat, but not eliminated, in recent years, in part driven by disruptive entrants that have seen a marketing advantage in *not* requiring potential customers to sign term contracts as a condition for obtaining service.

(15) The presence and persistence of onerous terms and conditions in customer service adhesion agreements provide further evidence of a fundamentally noncompetitive market

92. Traditionally, for services that were subject to rate regulation and a "just and reasonable" ratemaking standard, the terms and conditions governing the provider/customer relationship were set out in and governed by filed tariffs. In the event of a dispute, customers could bring complaints regarding their service to the CPUC or other applicable regulatory body for resolution or adjudication. For disputes that could not be resolved or that had general applic-ability across a number of individual consumers, consumers or the commission itself could initiate a formal complaint proceeding. In the absence of formal tariffs, the terms and conditions

of the provider/customer relationship are typically documented in a contract between the two parties. Such "customer service agreements" ("CSAs") are typically adhesion contracts whose terms are dictated to customers on a take-it-or-leave-it basis, often at the point of sale or simply referenced in a telephone contact; the customer has no opportunity or ability to negotiate any aspect of such agreements.

93. Among the provisions common to many telecommunications CSAs are limitations of liability clauses, late payment penalties, early cancellation fees, or other provisions that are generally intended to protect the provider moreso than the customer and/or to simply increase switching costs as perceived by the customer. Additionally, many CSAs include provisions calling for mandatory arbitration of disputes and so-called "class action waivers" that prevent customers from pursuing issues that may affect many or most customers in class action lawsuits or even in class action arbitrations. The California Supreme Court had rejected such contract provisions, finding that "when the waiver is found in a consumer contract of adhesion in a setting in which disputes between the contracting parties predictably involve small amounts of damages, and when it is alleged that the party with the superior bargaining power has carried out a scheme to deliberately cheat large numbers of consumers out of individually small sums of money, then, at least to the extent the obligation at issue is governed by California law, the waiver becomes in practice the exemption of the party 'from responsibility for [its] own fraud, or willful injury to the person or property of another.' (Civ.Code, § 1668.) Under these circumstances, such waivers are unconscionable under California law and should not be

enforced."[75] a 2011 US Supreme Court decision upheld such "arbitration clause/class action waiver" provisions as enforceable.[76]

94. In competitive markets, providers may attempt to differentiate their products by varying the terms and conditions of their agreements. For example, several of the smaller wireless carriers were the first to have abandoned term contracts and cancellation penalties; others have begun to quote "all-in" prices instead of a base price with undisclosed (in advertisements and at the time of purchase) fees and surcharges. The largest incumbents have since followed their smaller rivals' lead in some, but certainly not all, of these initiatives. Some of the onerous conditions extant in many CSAs might well not survive in competitive markets. That they continue to prevail in so many telecom sectors reinforces the fundamentally noncompetitive character of these services. Mitigation measures that aim to limit a provider's ability to include such onerous terms and conditions in its CSAs would provide an important constraint upon its exercise of market power.

95. A telecommunications provider's market power vis-a-vis an individual customer generally increases once the customer has initiated service. Prior to that point, the customer can shop among alternative providers where these exist, and can initiate service with the chosen provider without incurring any penalties or switching costs. That relationship changes as soon as the service is initiated such that, even if there are multiple providers in a market, the customer's

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75. *Discover Bank v. Superior Court*, 36 Cal. 4th 148 (2005).

76. *AT&T Mobility v. Concepcion*, 563 U.S. 321 (2011).

ability to migrate among them will be constrained by such factors as incompatible equipment, physical effort involved in switching providers, and in many cases by contractual provisions in the CSA. Regulation of terms and conditions – which, in the case of wireless services, is still subject to state PUC jurisdiction – can help to reduce switching costs and correspondingly increase competition overall.

(16) Monopoly power and monopsony power must be separately assessed, because the presence of substantial monopsony power may also permit the expansion of monopoly power in what otherwise might be competitive market segments.

96. As we have learned from the recent Comcast/TWC and Charter/TWC/Bright House merger proceedings, the applicants rarely address the effect of the transaction upon the monopsony power of the combined firm, arguing instead that because they do not compete in the same geographic areas, there is no net increase in their monopoly power or a decrease in competition. More generally, any substantial increase in a telecommunications provider's market dominance, its *monopsony power* – its ability to dictate terms of its purchases from upstream input providers – will in any event be increased even if there is no net change in monopoly power – the ability to dictate terms to downstream distributors and end-user customers. As such, these conditions must be separately examined.

97. While an increase in a firm's monopsony power may have its most adverse impact upon upstream suppliers, it may also impact downstream relationships and create or extend barriers to entry by competitors. For example, if the firm is able to negotiate lower prices from its suppliers

that are not being made available to smaller rivals, the input cost differential between what the large firm and smaller competitors confront could be increased. Worse still, the dominant firm could use its power to dictate terms to suppliers to limit rivals' access to the suppliers' services and products. Thus, while monopoly and monopsony power need to be separately and independently analyzed, their interdependence must also be recognized and addressed.

Performance

(17) Persistent service quality and customer service problems are indicative of a lack of effective competition.

98. Firms in competitive markets tend to be more customer-friendly than in situations where the firm's customers are viewed by it as largely captive. The quantity of customer complaints, the incidence of service outages, the average time to repair, the responsiveness of customer service representatives in addressing customer service problems, all provide useful indicia of the relative level of effective competition for voice, VoIP, wireless and broadband, and of their respective ability to produce a "competitive outcome" with respect to such situations.

99. Telecommunications providers of all types – cable MSOs, ILECs, Satellite TV providers, CMRS carriers – are consistently rated among the poorest US corporations with respect to customer service,[77] and are consistently included among the "most hated" US

77. See, e.g., "Best And Worst Customer Service In America" *Forbes*, July 23, 2014, available at http://www.forbes.com/sites/nextavenue/2014/07/23/best-and-worst-customer-service-in-america/#43fb2bec466d (accessed 03/08/16); *2015 Temkin Customer Service Ratings*, available at http://temkinratings.com/temkin-ratings/temkin-customer-service-ratings-2015/ (accessed 03/08/16).

companies. From the testimony adduced during the 11 Public Participation Hearings held in the Verizon/Frontier case, it would seem that Verizon's conduct with respect to maintenance of its copper distribution network and its response to customer trouble reports and related complaints is consistent with a lack of competitive alternatives for many current Verizon customers. Such conduct is not consistent with a robustly competitive market, even for legacy wireline voice services.

(18) A key factor in evaluating the performance of a deregulated telecommunications market is the extent to which universal service deployment and availability has been achieved.

100. Universal voice service penetration was a central goal of US telecommunications policy for most of the twentieth century. The United States was one of the first developed countries to achieve universal telephone service, and this result was accomplished under a regulatory model involving what can perhaps best be described as a public-private partnership, one that relied upon private capital with public underwriting of risk, providing investors with an assured return on and recovery of their investment, while protecting consumers from excessive prices where competitive market constraints were considered to be impractical or nonexistent. This form of economic regulation went out of favor more than two decades ago, but its role in achieving universal voice telephone service is rarely discussed or appreciated. Wireless and cable television penetration, while still falling short of the "universal" availability of basic voice service, nevertheless employed a "franchise" model under which the franchisee or licensee committed to a level of build-out within the assigned service territory within a specified period

of time, as specified by the particular franchising authority as a condition for issuing the franchise.

101. High-speed broadband access has never been subject to government-imposed deployment requirements, and still falls far short of universal availability both nationally and in California. There have been regulatory initiatives aimed at encouraging additional deployment, like the FCC's Connect America Fund,[78] the California Advanced Services Fund ("CASF"),[79] and CPUC-imposed conditions for approval of change-of-control transactions, such as those included in the recent Verizon/Frontier transfer.[80] Tables 6A and 6B below provide the status of broadband availability in each California county at the 25/3 and 10/1 service levels as of December 2014, based upon the Commission's Broadband Availability Database, Round 11.

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78. *Connect America Fund*, Report and Order, 29 FCC Rcd 15644 (2014).

79. The California Advanced Services Fund (CASF) is a universal service program administered by theCPUC. It promotes the deployment and adoption of broadband services in unserved and underserved communities by awarding grants (and loans) to help fund infrastructure projects and adoption programs throughout the State. The goal of the program is to approve funding for infrastructure projects that will provide broadband access to no less than 98 percent of California households. P.U. Code §281(b)(1)

80. In the recently-concluded Verizon/Frontier change-of-control proceeding, Frontier had initially committed, from the outset, to increase the availability of 25 Mbps download, 2-3 Mbps upload ("25/2-3") broadband within what was to become its expanded California service area by some 250,000 additional households passed. D.15-12-005, at Appendix 1, p. 6. Frontier had also initially committed to accept $32-million in annual CAP II funding for six years and would "agree to upgrade approximately 77,402locations in California" to the minimum CAF II standard of 10 Mbps download and 1 Mbps upload over that six-year period. *Id.* In a partial settlement reached among Frontier, ORA, TURN, and the Center for Accessible Technology, Frontier agreed to increase the 25/2-3 broadband build-out by an additional 150,000 households to a total of 400,000 households by 2022. "As part of this settlement, Frontier further commits to deploy or augment broadband services to provide broadband service to support speeds of 6 Mbps downstream and 1 to 1.5 Mbps upstream for an additional 250,000 unserved and underserved households in the Verizon California and/or its existing California service area by December 31, 2022. In addition, in its testimony, Frontier also committed to deploy broadband to an additional 100,000 unserved households to 10 Mbps downstream and I Mbps upstream by December 31, 2020." *Id.*

Table 6A lists counties in alphabetical order; Table 6B ranks them by the percentage of broadband availability at the 25/3 service level. Figures 8 and 9 provide county maps of California showing the percentage of broadband availability at the 25/3 and 10/1 service levels, respectively. The percentages are based upon total households in each county using 2015 population data obtained from the California Department of Finance,[81] and include households where no broadband at all is available. Statewide, 91.91% and 93.87% of California households have access to broadband and 25/3 and 10/1, respectively. The major urban and suburban counties have 25/3 availability above 90%, but outside of these areas the availability rate is often considerably lower. This data is as of December 2014 and reflects availability, not actual subscriptions. If and as additional data from the Respondents becomes available, I will revise these tables and maps accordingly.

81. "E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2015 with 2010 Census Benchmark," http://www.dof.ca.gov/research/demographic/reports/estimates/e-5/2011-20/view.php (accessed 3/8/16)

Table 6A HOUSEHOLDS WITH BROADBAND AVAILABILITY, BY COUNTY (As of December 2014, Alphabetical Order)		
COUNTY	**≥ 25/3 Mbps**	**≥ 10/1 Mbps**
STATEWIDE	**91.91%**	**93.87%**
Alameda	95.08%	96.13%
Alpine	2.17%	54.35%
Amador	25.38%	78.72%
Butte	85.72%	86.23%
Calaveras	68.21%	79.56%
Colusa	36.74%	53.87%
Contra Costa	96.37%	97.19%
Del Norte	83.60%	83.60%
El Dorado	74.72%	78.71%
Fresno	85.19%	90.23%
Glenn	63.16%	67.26%
Humboldt	74.86%	76.66%
Imperial	82.44%	85.76%
Inyo	77.40%	80.39%
Kern	81.10%	87.40%
Kings	72.51%	78.26%
Lake	81.38%	82.63%
Lassen	0.29%	35.57%
Los Angeles	97.76%	97.87%
Madera	58.87%	86.09%
Marin	93.34%	94.34%
Mariposa	0.20%	68.40%
Mendocino	64.66%	70.20%
Merced	80.47%	85.90%
Modoc	No Households Passed 25/3 and Up	35.50%
Mono	8.44%	58.01%
Monterey	69.31%	84.18%
Napa	87.81%	89.41%
Nevada	70.14%	74.42%
Orange	95.73%	95.96%
Placer	85.13%	90.28%
Plumas	No Households Passed 25/3 and Up	13.25%
Riverside	95.16%	96.13%
Sacramento	93.58%	95.52%
San Benito	83.72%	86.78%
San Bernardino	92.63%	94.61%
San Diego	92.58%	93.45%
San Francisco	96.78%	96.87%
San Joaquin	90.16%	91.75%
San Luis Obispo	85.31%	85.64%
San Mateo	93.68%	97.40%
Santa Barbara	89.51%	91.50%
Santa Clara	93.58%	94.91%
Santa Cruz	90.41%	91.06%
Shasta	71.80%	78.18%
Sierra	No Households Passed 25/3 and Up	10.35%
Siskiyou	No Households Passed 25/3 and Up	61.90%
Solano	90.93%	92.92%
Sonoma	92.19%	93.75%
Stanislaus	92.23%	93.52%
Sutter	89.30%	90.77%
Tehama	52.96%	59.20%
Trinity	No Households Passed 25/3 and Up	No Households Passed 10/1 and Up
Tulare	65.28%	81.41%
Tuolumne	62.11%	63.91%
Ventura	96.76%	97.26%
Yolo	85.32%	88.99%
Yuba	75.38%	78.48%

Table 6B
HOUSEHOLDS WITH BROADBAND AVAILABILITY BY COUNTY
(As of December 2014, Ranked by availability at 25/3 service level)

COUNTY	≥ 25/3 Mbps	≥ 10/1 Mbps
Trinity	No Households Passed 25/3 and Up	No Households Passed 10/1 and Up
Sierra	No Households Passed 25/3 and Up	10.35%
Plumas	No Households Passed 25/3 and Up	13.25%
Modoc	No Households Passed 25/3 and Up	35.50%
Siskiyou	No Households Passed 25/3 and Up	61.90%
Mariposa	0.20%	68.40%
Lassen	0.29%	35.57%
Alpine	2.17%	54.35%
Mono	8.44%	58.01%
Amador	25.38%	78.72%
Colusa	36.74%	53.87%
Tehama	52.96%	59.20%
Madera	58.87%	86.09%
Tuolumne	62.11%	63.91%
Glenn	63.16%	67.26%
Mendocino	64.66%	70.20%
Tulare	65.28%	81.41%
Calaveras	68.21%	79.56%
Monterey	69.31%	84.18%
Nevada	70.14%	74.42%
Shasta	71.80%	78.18%
Kings	72.51%	78.26%
El Dorado	74.72%	78.71%
Humboldt	74.86%	76.66%
Yuba	75.38%	78.48%
Inyo	77.40%	80.39%
Merced	80.47%	85.90%
Kern	81.10%	87.40%
Lake	81.38%	82.63%
Imperial	82.44%	85.76%
Del Norte	83.60%	83.60%
San Benito	83.72%	86.78%
Placer	85.13%	90.28%
Fresno	85.19%	90.23%
San Luis Obispo	85.31%	85.64%
Yolo	85.32%	88.99%
Butte	85.72%	86.23%
Napa	87.81%	89.41%
Sutter	89.30%	90.77%
Santa Barbara	89.51%	91.50%
San Joaquin	90.16%	91.75%
Santa Cruz	90.41%	91.06%
Solano	90.93%	92.92%
STATEWIDE	**91.91%**	**93.87%**
Sonoma	92.19%	93.75%
Stanislaus	92.23%	93.52%
San Diego	92.58%	93.45%
San Bernardino	92.63%	94.61%
Marin	93.34%	94.34%
Sacramento	93.58%	95.52%
Santa Clara	93.58%	94.91%
San Mateo	93.68%	97.40%
Alameda	95.08%	96.13%
Riverside	95.16%	96.13%
Orange	95.73%	95.96%
Contra Costa	96.37%	97.19%
Ventura	96.76%	97.26%
San Francisco	96.78%	96.87%
Los Angeles	97.76%	97.87%

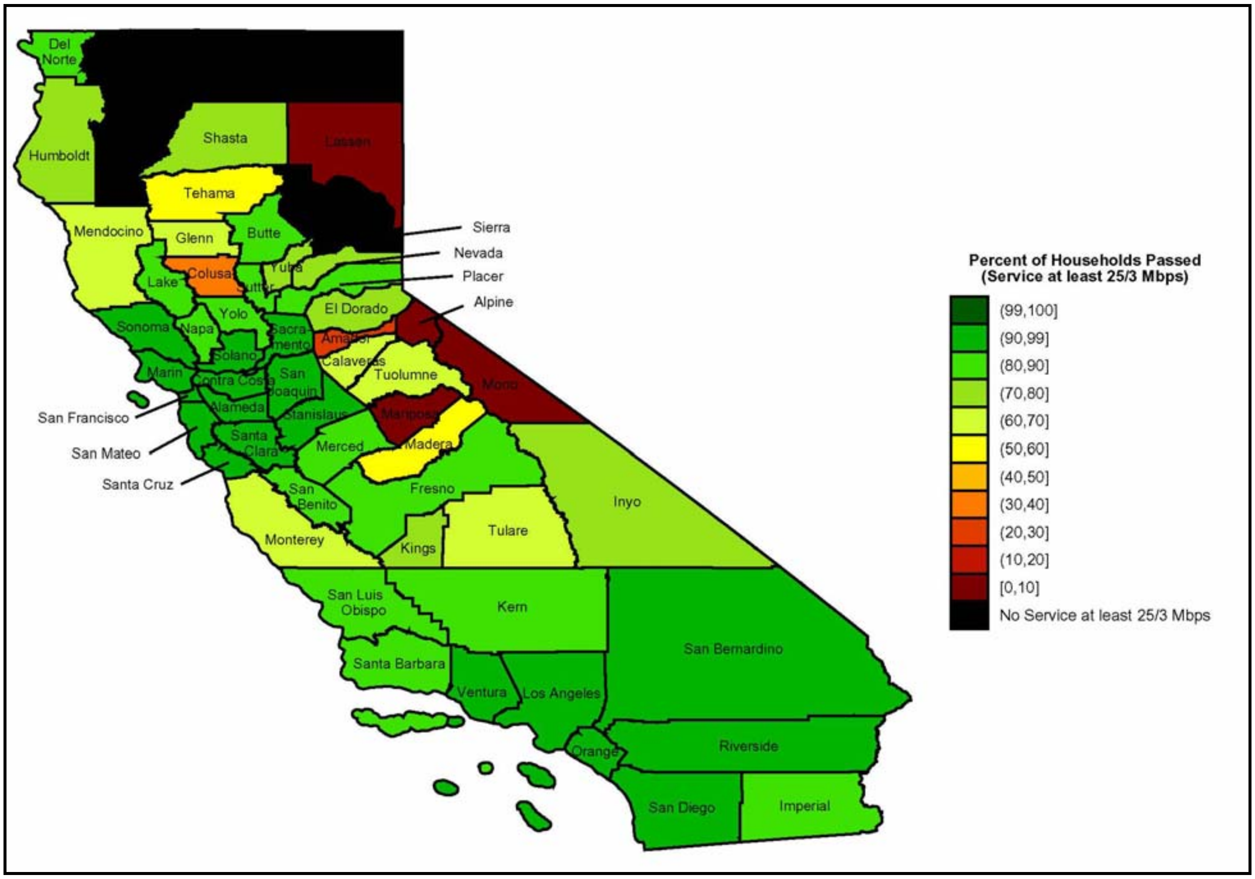

Figure 8. Percentage of total households with broadband availability at the 25/3 service level, by county.

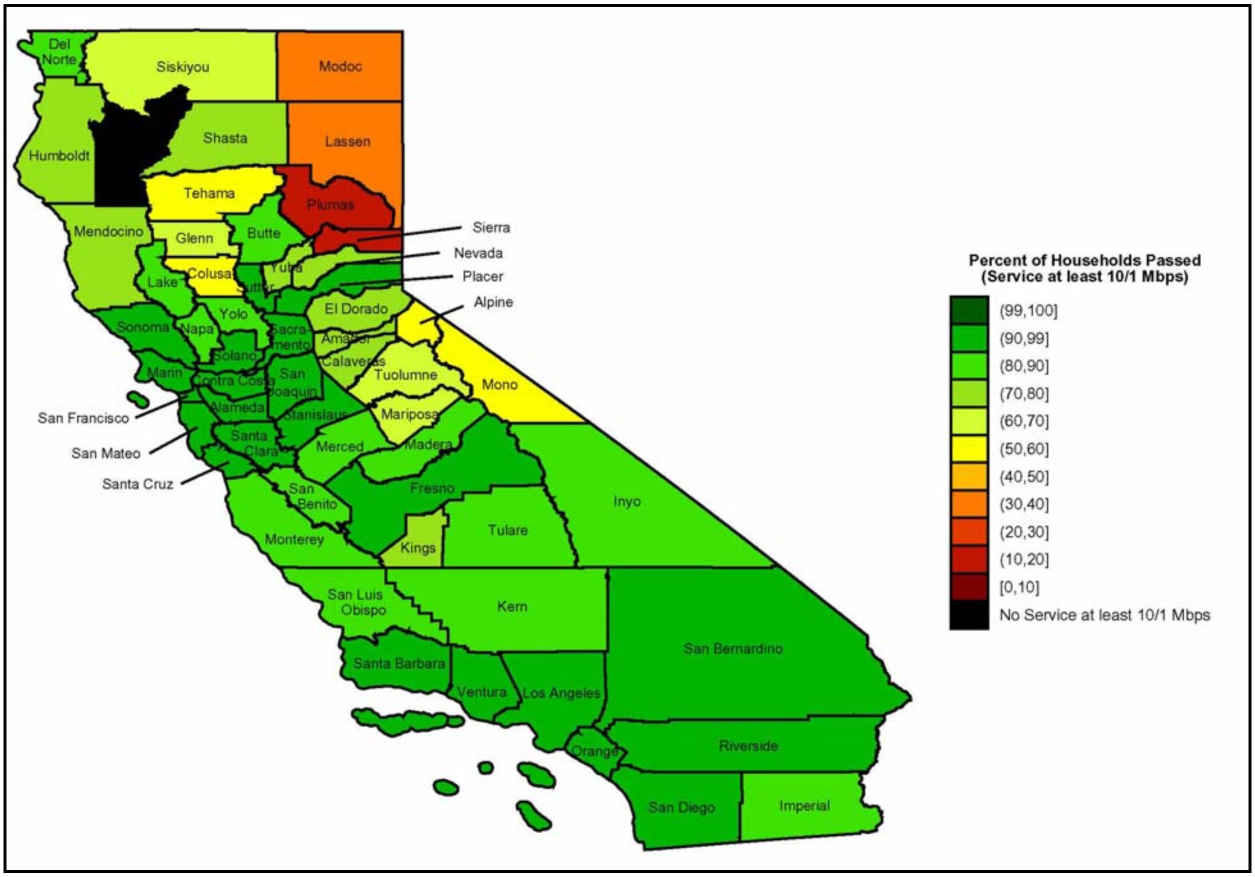

Figure 9. Percentage of total households with broadband availability at the 10/1 service level, by county

(19) A key factor in evaluating the performance of a deregulated telecommunications market is the extent to which effective and sustainable competition has been achieved.

102. The traditional role of economic regulation of public utilities, including telecommunications service providers, is to achieve a "competitive outcome" where, due primarily to conditions of supply – e.g., high fixed costs, large capital investments, high Minimum Efficient Scale, all leading to "natural monopoly" – competition is unlikely to develop such that regulatory oversight is required to assure that prices and output similar to those that would prevail in competitive markets. Tables 7A and 7B below identify the percentage of households in each California county where broadband is available from more than one service provider at 25/3 and 10/1 service levels as of December 2014, based upon the Commission's Broadband Availability Database, Round 11. Table 7A is presented alphabetically; Table 7B is ranked by the percentage of competitive availability at the 25/3 service level. Figures 10 and 11 provide county maps of California showing the percentage of competitive broadband availability at the 25/3 and 10/1 service levels, respectively. Unlike Tables 6A and 6B and the corresponding Figures 8 and 9, which were based upon *total* households in each county, Tables 7A and 7B and the Figure 10 and 11 maps are based upon only those households that have *some* broadband access at any speed level. Statewide, only 27.54% and 81.51% of households with any broadband access are served by two or more providers at the 25/3 and 10/1 service levels, respectively.

Table 7A
HOUSEHOLDS WITH BROADBAND AVAILABILITY, MORE THAN ONE SERVICE PROVIDER
(As of December 21014, Alphabetical Order)

COUNTY	≥ 25/3 Mbps	≥ 10/1 Mbps
STATEWIDE	**27.54%**	**81.51%**
Alameda	37.23%	94.07%
Alpine	0.00%	0.00%
Amador	0.29%	43.45%
Butte	0.00%	34.13%
Calaveras	4.80%	39.13%
Colusa	0.00%	9.54%
Contra Costa	33.04%	90.82%
Del Norte	0.00%	70.83%
El Dorado	0.76%	55.38%
Fresno	3.14%	81.25%
Glenn	1.49%	84.88%
Humboldt	0.00%	47.80%
Imperial	0.00%	54.93%
Inyo	0.00%	38.48%
Kern	2.56%	71.77%
Kings	2.64%	64.05%
Lake	0.00%	45.50%
Lassen	0.00%	0.00%
Los Angeles	31.00%	80.20%
Madera	5.16%	71.32%
Marin	38.00%	84.85%
Mariposa	0.00%	12.92%
Mendocino	51.46%	58.03%
Merced	3.72%	65.93%
Modoc	No Households Passed 25/3 and Up	0.00%
Mono	0.00%	12.20%
Monterey	3.88%	75.60%
Napa	23.08%	94.29%
Nevada	0.58%	40.14%
Orange	15.10%	76.37%
Placer	10.21%	76.84%
Plumas	No Households Passed 25/3 and Up	20.84%
Riverside	50.81%	86.00%
Sacramento	32.59%	88.92%
San Benito	2.02%	87.76%
San Bernardino	48.12%	79.05%
San Diego	6.44%	91.77%
San Francisco	85.36%	95.33%
San Joaquin	3.37%	85.22%
San Luis Obispo	0.30%	38.89%
San Mateo	53.13%	86.28%
Santa Barbara	1.09%	56.50%
Santa Clara	24.33%	88.53%
Santa Cruz	50.61%	74.52%
Shasta	0.00%	37.51%
Sierra	No Households Passed 25/3 and Up	0.00%
Siskiyou	No Households Passed 25/3 and Up	55.38%
Solano	10.56%	89.37%
Sonoma	49.74%	90.99%
Stanislaus	3.48%	88.49%
Sutter	1.62%	91.74%
Tehama	0.00%	50.65%
Trinity	No Households Passed 25/3 and Up	No Households Passed 10/1 and Up
Tulare	3.99%	61.10%
Tuolumne	0.00%	30.66%
Ventura	39.83%	79.44%
Yolo	28.38%	90.80%
Yuba	4.27%	81.67%

Table 7B
HOUSEHOLDS WITH BROADBAND AVAILABILITY, MORE THAN ONE SERVICE PROVIDER
(As of December 2014, Ranked by percent of competitive availability)

COUNTY	≥ 25/3 Mbps	≥ 10/1 Mbps
Trinity	No Households Passed 25/3 and Up	No Households Passed 10/1 and Up
Modoc	No Households Passed 25/3 and Up	0.00%
Sierra	No Households Passed 25/3 and Up	0.00%
Plumas	No Households Passed 25/3 and Up	20.84%
Siskiyou	No Households Passed 25/3 and Up	55.38%
Alpine	0.00%	0.00%
Butte	0.00%	34.13%
Colusa	0.00%	9.54%
Del Norte	0.00%	70.83%
Humboldt	0.00%	47.80%
Imperial	0.00%	54.93%
Inyo	0.00%	38.48%
Lake	0.00%	45.50%
Lassen	0.00%	0.00%
Mariposa	0.00%	12.92%
Mono	0.00%	12.20%
Shasta	0.00%	37.51%
Tehama	0.00%	50.65%
Tuolumne	0.00%	30.66%
Amador	0.29%	43.45%
San Luis Obispo	0.30%	38.89%
Nevada	0.58%	40.14%
El Dorado	0.76%	55.38%
Santa Barbara	1.09%	56.50%
Glenn	1.49%	84.88%
Sutter	1.62%	91.74%
San Benito	2.02%	87.76%
Kern	2.56%	71.77%
Kings	2.64%	64.05%
Fresno	3.14%	81.25%
San Joaquin	3.37%	85.22%
Stanislaus	3.48%	88.49%
Merced	3.72%	65.93%
Monterey	3.88%	75.60%
Tulare	3.99%	61.10%
Yuba	4.27%	81.67%
Calaveras	4.80%	39.13%
Madera	5.16%	71.32%
San Diego	6.44%	91.77%
Placer	10.21%	76.84%
Solano	10.56%	89.37%
Orange	15.10%	76.37%
Napa	23.08%	94.29%
Santa Clara	24.33%	88.53%
STATEWIDE	**27.54%**	**81.51%**
Yolo	28.38%	90.80%
Los Angeles	31.00%	80.20%
Sacramento	32.59%	88.92%
Contra Costa	33.04%	90.82%
Alameda	37.23%	94.07%
Marin	38.00%	84.85%
Ventura	39.83%	79.44%
San Bernardino	48.12%	79.05%
Sonoma	49.74%	90.99%
Santa Cruz	50.61%	74.52%
Riverside	50.81%	86.00%
Mendocino	51.46%	58.03%
San Mateo	53.13%	86.28%
San Francisco	85.36%	95.33%

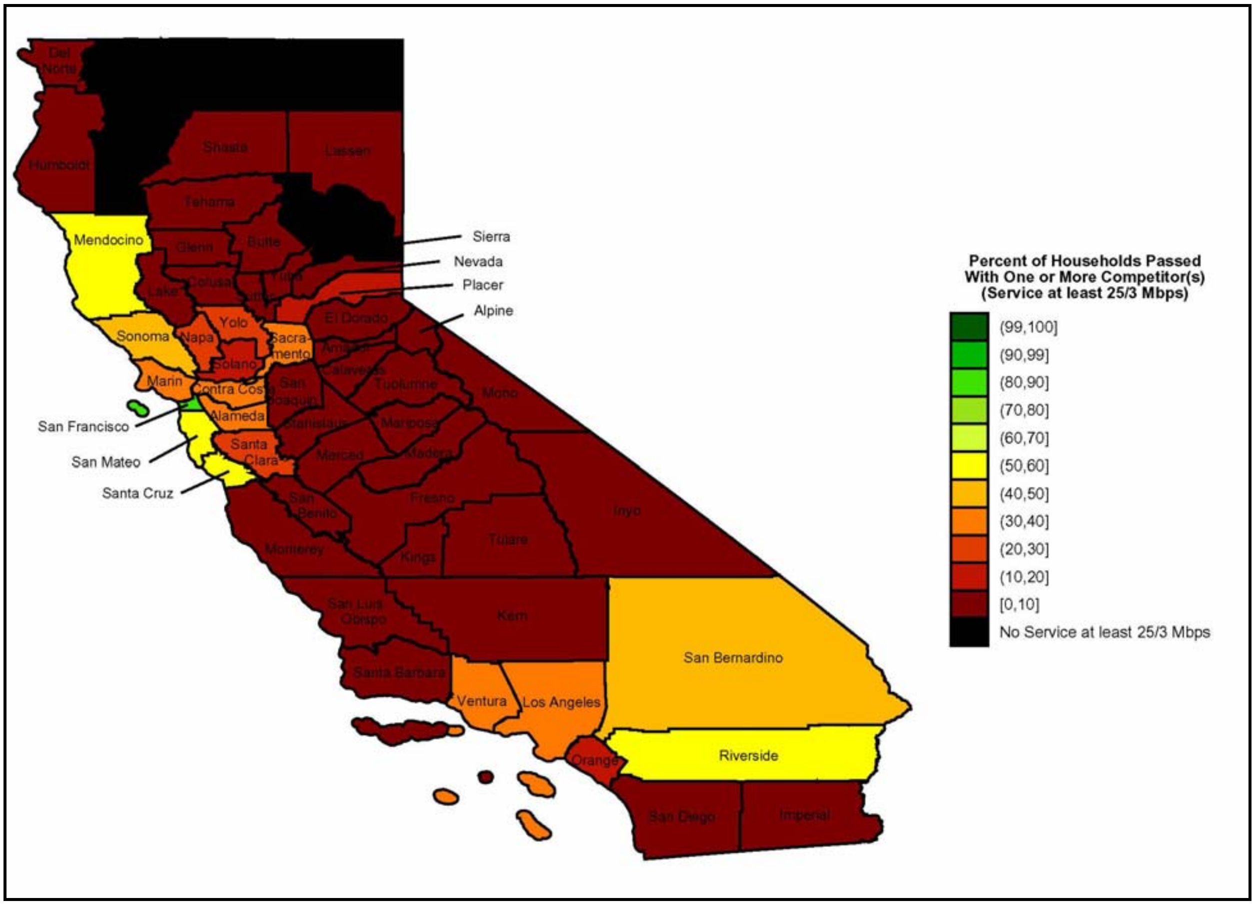

Figure 10. Percentage of Households in Each California County with any Competitive Broadband Availability at the 25 Mbps Download and 3 Mbps Upload Service Levels as of December 2014

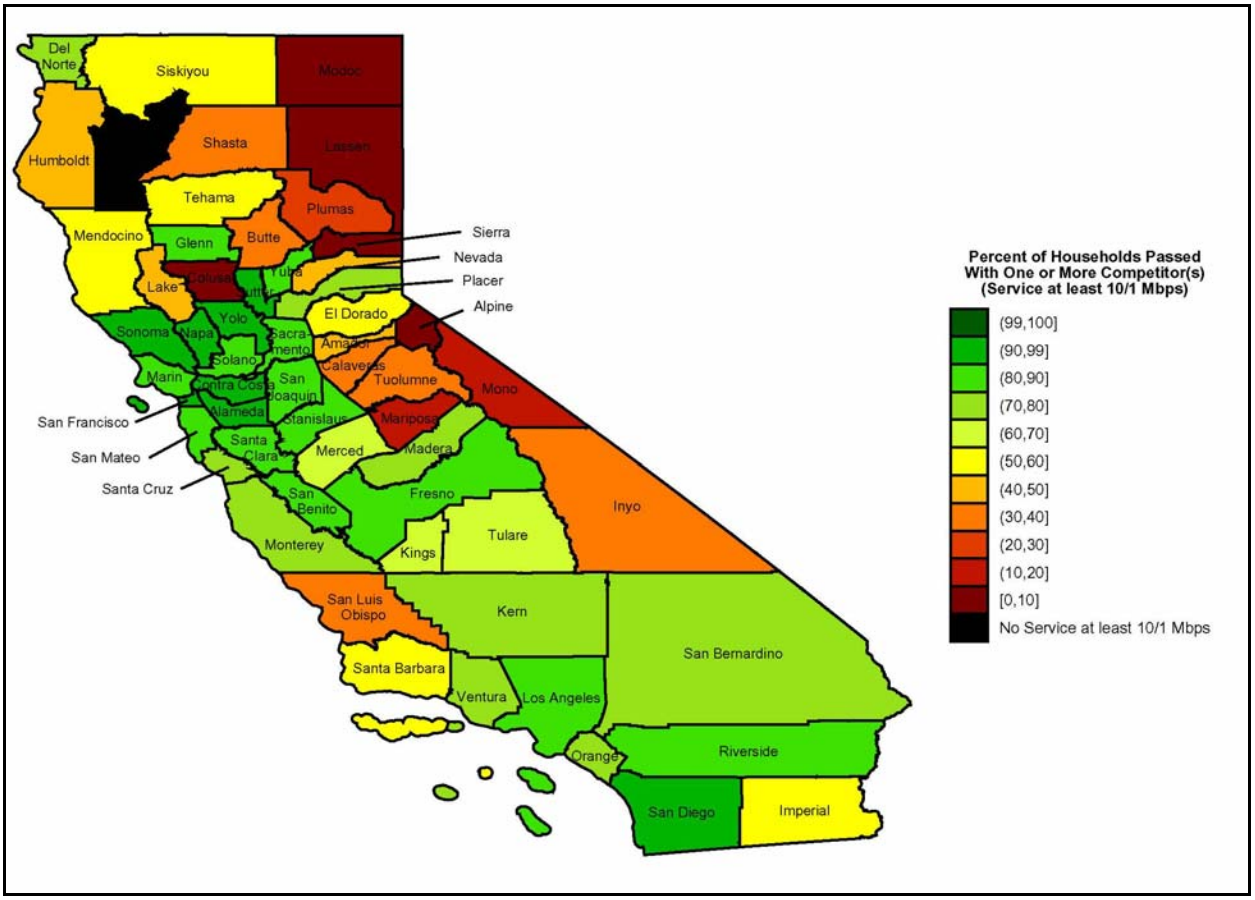

Figure 11. Percentage of Households in Each California County with any Competitive Broadband Availability at the 10 Mbps Download and 1 Mbps Upload Service Levels as of December 2014

Conclusion

103. As discussed here, many of the deregulatory initiatives have been premised upon *assumptions* as to the sufficiency of competition to achieve a competitive outcome in the absence of price and earnings regulation. The present OII is intended to develop empirical evidence based upon actual market facts and conditions extant in California on the extent to which these assumptions and forecasts have been accurate since the adoption of URF a decade ago. As noted earlier, national price data suggests a succession of price increases for cable TV and fixed broadband, while just the opposite has occurred in the far more competitive wireless voice and data market. If a similar pattern is found to exist in California, those segments that have been experiencing a succession of price increases cannot be viewed as being subject to effective competition, and affirmative regulatory intervention will need to be considered.

104. In this testimony, I have provided a framework by which the Commission can measure the level of competition at both the retail and wholesale level, and to determine whether prices of services such as voice and broadband are just and reasonable. A data-driven regulatory solution that combines ongoing market monitoring together with automatic mechanisms that can become operative when specific market conditions are detected will best protect consumers, competitors and incumbent service providers by creating a level of certainty as to when and how regulatory measures will be put in place. Competition, not regulation, is always the preferred means for protecting all market participants. But where competition is not or cannot be sufficient to achieve this outcome, the initiation of regulatory measures whose timing and effect is known in advance by all concerned will assure an effective and efficient market outcome.

105. This concludes my direct testimony at this time. I anticipate submitting additional testimony addressing other questions in the OII as well as responding to submissions by other parties at the appropriate time.

DECLARATION

I declare under penalty of perjury that the foregoing statements are true and correct to the best of my knowledge, information and belief, and if called to testify thereon I am prepared to do so.

LEE L. SELWYN

Executed at Boston, Massachusetts

this 9th day of March, 2016.

Attachment 1

Statement of Qualifications
Dr. Lee L. Selwyn

ECONOMICS AND TECHNOLOGY, INC.

Statement of Qualifications

LEE L. SELWYN

Dr. Lee L. Selwyn has been actively involved in the telecommunications field for more than forty years, and is an internationally recognized authority on telecommunications regulation, economics and public policy. Dr. Selwyn founded the firm of Economics and Technology, Inc. in 1972, and has served as its President since that date. He received his Ph.D. degree from the Alfred P. Sloan School of Management at the Massachusetts Institute of Technology. He also holds a Master of Science degree in Industrial Management from MIT and a Bachelor of Arts degree with honors in Economics from Queens College of the City University of New York.

Dr. Selwyn has testified as an expert on rate design, service cost analysis, form of regulation, and other telecommunications policy issues in telecommunications regulatory proceedings before some forty state commissions, the Federal Communications Commission and the Canadian Radio-television and Telecommunications Commission, among others. He has appeared as a witness on behalf of commercial organizations, non-profit institutions, as well as local, state and federal government authorities responsible for telecommunications regulation and consumer advocacy.

He has served or is now serving as a consultant to numerous state utilities commissions including those in Arizona, Minnesota, Kansas, Kentucky, the District of Columbia, Connecticut, California, Delaware, Maine, Massachusetts, New Hampshire, Vermont, New Mexico, Wisconsin and Washington State, the Office of Telecommunications Policy (Executive Office of the President), the National Telecommunications and Information Administration, the Federal Communications Commission, the Canadian Radio-television and Telecommunications Commission, the United Kingdom Office of Telecommunications, and the Secretaria de Comunicaciones y Transportes of the Republic of Mexico. He has also served as an advisor on telecommunications regulatory matters to the International Communications Association and the Ad Hoc Telecommunications Users Committee, as well as to a number of major corporate telecommunications users, information services providers, competitive local exchange carriers, interexchange carriers, wireless services providers, and specialized access services carriers.

Dr. Selwyn has presented testimony as an invited witness before the U.S. House of Representatives Subcommittee on Telecommunications, Consumer Protection and Finance and before the U.S. Senate Judiciary Committee, on subjects dealing with restructuring and deregulation of portions of the telecommunications industry.

In 1970, he was awarded a Post-Doctoral Research Grant in Public Utility Economics under a program sponsored by the American Telephone and Telegraph Company, to conduct research on the economic effects of telephone rate structures upon the computer time sharing industry. This work was conducted at Harvard University's Program on Technology and Society, where he was appointed as a Research Associate. Dr. Selwyn was also a member of the faculty at the College of Business Administration at Boston University from 1968 until 1973, where he taught courses in economics, finance and management information systems.

Dr. Selwyn has been an invited speaker at numerous seminars and conferences on telecommunications regulation and policy, including meetings and workshops sponsored by the National Telecommunications and Information Administration, the National Association of Regulatory Utility Commissioners, the U.S. General Services Administration, the Institute of Public Utilities at Michigan State University, the National Regulatory Research Institute, the Harvard University Program on Information Resources Policy, the Columbia University Institute for Tele-Information, the Massachusetts Institute of Technology Alfred P. Sloan School of Management, the National Association of State Utility Consumer Advocates (NASUCA), the National Conference of Regulatory Attorneys, as well as at numerous conferences and workshops sponsored by individual regulatory agencies. Dr. Selwyn is an elected Town Meeting Member for the Town of Brookline, Massachusetts, and serves on the Town's Advisory and Finance Committee and its Subcommittee on Planning and Regulation, on the Town's Audit Committee, and on its Tax Override Study Committee.

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"Assessing Market Power and Competition in The Telecommunications Industry: Toward an Empirical Foundation for Regulatory Reform," *Federal Communications Law Journal*, Vol. 40 Num. 2, April 1988.

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RECORD OF EXPERT TESTIMONY

DR. LEE L. SELWYN

2016

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New York Public Service Commission, *Proceeding on Motion of the Commission as to the Rates, Charges, and Regulations of New York Telephone*, Case No. 28264, on behalf of Suffolk County, Direct Testimony filed November 4, 1982, Rebuttal Testimony filed November 29, 1982.

New York Pubic Service Commission, *Proceeding on Motion of the Commission as to the Rates, Charges, and Regulations of New York Telephone*, Case No. 28264, on behalf of ABC, Inc., CBS, Inc., General Electric Company, and Mobil Corporation, Direct Testimony filed November 4, 1982, Rebuttal Testimony filed November 29, 1982.

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Utah Public Service Commission, *Application of the Mountain States Telephone and Telegraph Company for Approval of an Increase in Rates and Associated Tariff Revisions*, Docket No. 80-049-01, on behalf of State of Utah Department of Finance, University of Utah, Utah State University, Weber State College, Brigham Young University, Direct Testimony filed March 6, 1981, Surrebuttal Testimony filed June 29, 1981, cross-examination April 9, 1981.

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Michigan Public Service Commission, *Application of Michigan Bell Telephone Company for authority to file Tariff MPSC No. 80 to provide for the offering of Republican National Convention Service and for the authority to* *withdraw Tariff MPSC No. 80 on or before October 1, 1980*, Docket No. U-6327, on behalf of Committee of Arrangement of the Republican National Convention, ABC, Inc., CBS, Inc., NBC, Inc., Direct Testimony filed January 25, 1980.

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Illinois Commerce Commission, *Illinois Bell Telephone Company Proposed general increase in telephone rates applicable in all exchanges of the Company in Illinois*, Docket No. 78-0034, on behalf of Illinois Retail Merchants Association, Direct Testimony filed June 9, 1978, cross-examination July 10, 1978.

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Illinois Commerce Commission, *Illinois Bell Telephone Company Proposed rates and regulations for Direct Inward Dialing Service for the Company-owned or Customer-provided PBX dial switchboards, applicable to all exchanges of the Company,* Docket No. 77-0511, on behalf of Spiegel, Inc., Sears, Roebuck and Company, Carle Foundation Hospital, Brunswick Corporation, Lord, Bessell & Brook, Direct Testimony filed March 23, 1978, cross-examination April 5, 1978.

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Illinois Commerce Commission, *Illinois Bell Telephone Company Proposed general increase in telephone rates applicable to all exchanges of the Company in Illinois*, Docket No. 76-0409, on behalf of Illinois Retail Merchants Association, Direct Testimony filed January 1977, cross-examination January 30, 1977.

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California Public Service Commission, *Application of the Pacific Telephone and Telegraph Company, a corporation, for telephone service rate increases to cover increased costs in providing telephone service*, Application No. 55492, on behalf of California Retailers Association, California Manufacturers Association, Direct Testimony filed October 11, 1976, cross-examination October 27, 1976.

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Illinois Commerce Commission, *Illinois Bell Telephone Company Proposed rate increase for Private Line and Mileage Services, revisions and increases for Telephone Answering Service Equipment and Services applicable to all exchanges of the company in Illinois*, Docket No. 76-0200, on behalf of Illinois Retail Merchants Association, Direct Testimony filed October 1976, cross-examination November 10, 1976.

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New Jersey Public Utilities Commission, *Petition Filed by New Jersey Bell Telephone Company Increasing its Rates, Message Toll Rates and Charges for Certain Items of Equipment, Facilities, and Service in the State of New Jersey*, Docket No. 7512-1251, on behalf of New Jersey Retail Merchants Association, Direct Testimony filed May 17, 1976, cross-examination June 16, 1976.

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North Carolina Utilities Commission, *Application of Southern Bell Telephone and Telegraph Company for Authority to Increase its Local Exchange Rates and Charges Throughout its Franchised Areas in North Carolina*, Docket No. P-55 Sub 742, on behalf of North Carolina Retail Merchants Association, Direct Testimony filed September 23, 1975, cross-examination October 16, 1975.

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Florida Public Service Commission, *Petition of Southern Bell Telephone and Telegraph Company under Section 364.05, Florida Statutes for Consent to Place in Effect Certain New Rate Schedules*, Docket No. 74805-TP, on behalf of Florida Retail Federation, Direct Testimony filed July 11, 1975, July 18, 1975, cross-examination June 30, 1975, July 29, 1975, October 8, 1975.

Florida Public Service Commission, *Petition of General Telephone Company of Florida under Section 364.05, Florida Statutes, that Consent be Given to the Placing in Effect of the New Rate Scheduled filed herewith to Accomplish an Increase in the Rates and Charges for Intrastate Telephone Services Rendered by Said Company to the Level of Reasonable Compensation for such Services and in the Alternative for Partial Relief on an Interim Basis,* Docket No.74792-TP , on behalf of Florida Retail Federation, Direct Testimony filed June 18, 1975, July 18, 1975, cross-examination June 30, 1975, July 29, 1975.

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1974

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District of Columbia Public Service Commission, *Complaint and Application of the Chesapeake and Potomac Telephone Company for Hearing and Investigation Regarding Its Current Level of Earnings and Level of Rates*, Docket No. 595, on behalf of General Services Administration and the District of Columbia Department of Highways and Traffic, Direct Testimony filed September 5, 1974, cross-examination September 12, 1974.

Oklahoma Corporation Commission, *Southwest General Telephone Company*, Docket No. 25048, on behalf of Oklahoma Retail Merchants Association, Direct Testimony filed February 18, 1974, cross-examination February 20, 1974.

1973

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New Mexico State Corporation Commission, *Review of General Telephone Company of the Southwest Proposed Rates and Tariff,* Docket No. 533; *and Complaint of JC Penney Company and Sears Roebuck and Company Re: General Telephone Company of the Southwest's General Exchange Tariff Section 40- Access Charge Service*, Docket No. 566, on behalf of J C Penney Company, Inc., Sears, Roebuck and Company, Direct Testimony filed July 25, 1973, Supplemental Direct Testimony filed December 19, 1973, cross-examination January 8, 1974.