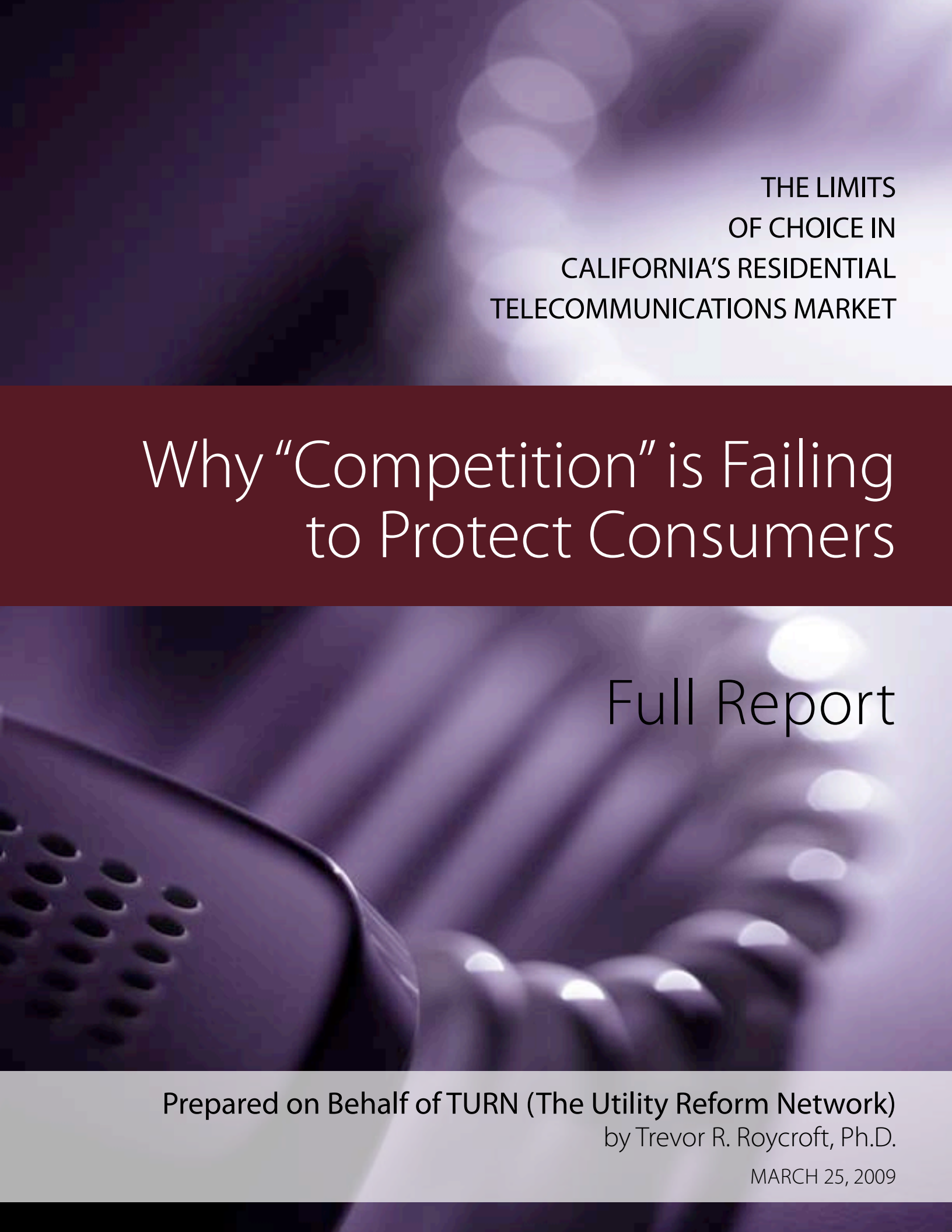

THE LIMITS
OF CHOICE IN
CALIFORNIA'S RESIDENTIAL
TELECOMMUNICATIONS MARKET

Why "Competition" is Failing to Protect Consumers

Full Report

Prepared on Behalf of TURN (The Utility Reform Network)
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Executive Summary

In August of 2006 the California Public Utilities Commission (CPUC) began eliminating remaining price caps on local service rates for the state's four largest telephone companies—AT&T, Verizon, SureWest, and Frontier. The CPUC concluded that these large telephone companies no longer possess market power, and that competition would protect the interests of consumers.[i] However, as price caps have been lifted, many consumers have experienced a series of dramatic price increases. Most recently, AT&T California, the state's largest telephone service provider, increased basic rates by 23%. Verizon, the state's second largest telephone service provider increased its basic rates by 13%. Even the "LifeLine" rates charged by these companies to low-income consumers were increased 12%. These basic service rate increases will cost California consumers millions of dollars per year.[ii] These latest rate increases come on top of other AT&T California and Verizon rate increases. Other AT&T price increases have ranged from 62% for Caller ID, to 86% for Call Waiting, to 110% for a three-minute local toll call, to 276% for a returned check charge. Verizon has raised the price of a three-minute local toll call 171%, directory assistance calls by 188%, and returned check charges by as much as 233%. Price increases of this magnitude are not consistent with a market where competition is protecting consumers.[iii]

This report evaluates recent market evidence, and reexamines the CPUC's conclusion that the state's largest telephone companies no longer possess market power. This report utilizes economic tools to evaluate markets for telephone services in California, and orients the analysis to answer a fundamental question associated with any assessment of market power—"Do consumers have the ability to choose from a sufficient number of alternatives to ensure that firms cannot arbitrarily raise prices, or otherwise disadvantage consumers?" Consumer choice is the foundation of competitive markets. If choice is limited, or does not exist at all, "market forces" will not protect consumers. Absent choice, market forces will tilt the playing field in favor of sellers, who will be able to raise rates and disadvantage consumers.

This report has examined information from a wide variety of sources, and has utilized geographic information systems to conduct a detailed investigation of the potential for consumer choice for local telephone services in nine (9) representative California counties, where approximately 48% of California's population resides.[iv] This research leads to the conclusion that there are substantial limits on the ability of California consumers to choose alternatives to the services offered by their local telephone company, and that "competition" is failing to protect consumers.

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i D.06-08-030 at 132 and 275. The Commission continues to reiterate this position. See, for example, Decision 08-09-042, at 10. This decision implemented a "uniform regulatory framework," and has been dubbed the "URF" decision as a result.

ii While data on the number of AT&T and Verizon basic service subscribers is unavailable, which prevents the calculation of the total cost of these basic service rate increases, data on the number of LifeLine subscribers is available. This data indicates that the LifeLine rate increases alone will cost California consumers an additional $19 million per year. Under a conservative set of assumptions, it is reasonable to expect that non-LifeLine customers will pay an additional $80 million per year.

iii According to the Bureau of Labor Statistics, nationwide, local telephone service rates increased an average of 2.73% per year between 2004 and 2008. This level of inflation is below the overall CPI average during the same period (3.19%), and reflects the on-going price regulation that governs basic telephone rates in most states.

iv The counties studied are: Alameda, Fresno, Humboldt, Los Angeles, Madera, Sacramento, San Bernardino, Santa Clara, and Shasta.

THE MAJOR FINDINGS OF THIS REPORT ARE:

1. Wireline telephone service has unique characteristics that, for many households, are difficult to substitute for with alternative voice technologies, such as wireless services or voice over Internet protocol (VoIP) services.

2. The CPUC evaluated markets in the 2005-2006 period. By 2008, competitors that were present in 2005-2006 have exited the market or curtailed operations. These competitors had been enabled by the Telecommunications Act of 1996 to resell the incumbent's local telephone services or network elements, however, the provisions of the 1996 Act that enabled this competition were overturned.

3. The CPUC, in deciding to lift price caps, relied heavily on the conclusion that wireless mobility services are a close substitute for wireline telephone service. Substantial evidence has emerged that indicates that this is not the case.

    - California has one of the lowest rates of wireless-only households in the nation. Only 9% of California households have cut the cord and gone "wireless-only." The overwhelming majority of California households continue to purchase local telephone services provided over wireline facilities.

    - Wireless substitution for wireline services is now recognized by the Federal Communications Commission as a niche-market phenomenon that does not affect most households.

    - Data from recent surveys regarding telephone usage conducted by the Centers for Disease Control demonstrate that there are statistically significant factors that make it more likely for a household to rely on wireline telephone service. These factors include:

        - Age of household head
        - Race of household head
        - Size of the household
        - Home ownership
        - Marriage
        - Presence of individuals with health problems
        - Presence of individuals with a disability
        - Higher income levels

    These results suggest that wireless substitution is not an option for many households. However, the results associated with household income also suggest that the economic downturn may lead to households with declining incomes to abandon wireline telephone service out of economic necessity. This may lead to additional problems for households as the overall quality of telephone service degrades if a household abandons wireline due to income constraints.

4. The primary source of supply for local telephone services, other than local telephone companies, are cable television companies. This report finds that:

- Not all cable companies sell voice services, and other cable companies that do sell voice services may not have these services ubiquitously deployed in their service areas.

- Those cable companies that sell telephone service have varying policies regarding how they sell those services:

    - Most cable companies that sell voice services offer only packages of voice services that combine local, long distance, and vertical features. These service packages are priced well above stand-alone local service rates, and eliminate consumers' ability to find à la carte alternatives to local telephone company services.

    - Most cable companies promote the purchase of service bundles that combine video programming, high-speed Internet access, and voice services. These bundles have prices that typically start at more than $100 per month.

    - These factors reduce consumers' ability to choose alternatives to their local telephone company's service.

- It is likely that the majority of California households are located in an area where cable voice services are available from one alternative provider. However, this single alternative to the local telephone company does not provide sufficient competition to protect consumers.

- Some cable overbuild activity, where a third wireline connection to the the home is constructed, is evident in limited areas of the state. Cable overbuilders may provide an additional source of voice telephone services. However, cable overbuilders have the same limitations on their service offerings as conventional cable companies, i.e., selling voice services only in a package, and promoting bundles of video, Internet, and voice services. In these limited areas, some consumers may have two alternatives to their local telephone company.

- A significant number of California households are located in areas where there is no cable service provider offering voice services. While many of these households are in rural areas, there are also urban areas without cable voice alternatives. Thus many consumers have little choice except to accept the prices offered by their local telephone company.

5. Most California consumers face a market with two sellers of wireline telephone service—their local telephone company and their local cable company. Economists refer to this market structure as a duopoly. Duopoly markets have not been observed to perform well from the standpoint of encouraging price competition and protecting consumers.

6. Observed pricing behavior on the part of local telephone companies and their cable rivals does not reveal evidence of price competition. Data indicates that price leadership is occurring—alternative providers simply follow the pricing actions of the dominant telephone companies. Observed pricing reflects the actions of firms that recognize that consumers have little choice, and the result has been dramatic rate increases for many California consumers.

7. If competition for local telephone services were to be graded in the nine counties studied in this report, Sacramento County deserves a "D," but the balance of the counties would be awarded "D-"and "F" grades. Market forces are failing to offer adequate protection for California consumers across all of the areas studied.

In light of these findings, it is clear that California consumers, when purchasing local telephone services, are not finding the protection that a competitive market would offer. Unless corrective action is taken, consumers will pay prices that reflect the exercise of market power, leading to the undesirable outcomes of excessive prices, undue discrimination, and the unwarranted transfer of income from consumers to the providers of local telephone services.

POLICY RECOMMENDATIONS

It is clear from the observed behavior of telephone companies that market forces are not sufficient to protect consumers. Market outcomes in the service areas of the state's four largest telephone companies provide substantial evidence that consumers are facing firms that possess market power.

- As the last threads of price protection for basic service rates will be removed in early 2011 it is imperative that the CPUC take action to reinstate reasonable price caps for basic service rates. The price caps should, at a minimum, constrain basic rate increases to no more than the rate of inflation.[v]

- Beginning in 2011 the CPUC will permit basic rates to be geographically deaveraged, i.e., local telephone companies will have the ability to target specific communities with basic service rate increases. Given evidence of continuing market power, it is imperative that this provision of the CPUC's decision also be reversed. The continuing market power identified in this report, combined with local telephone companies' ability to geographically target rate increases, can only increase the harms already experienced by California consumers.

- In addition to a price cap on basic rates, LifeLine rate increases should be reversed, and a uniform, affordable, LifeLine rate should be established statewide. The continued affordability of basic telephone service to low-income households is a pressing issue given the economic crisis that is gripping California.

- Finally, the CPUC should more closely monitor market outcomes associated with pricing, service quality, and the delivery of advanced services.

Market forces are failing to deliver the benefits that the local telephone companies promised the CPUC as it made its decision to remove pricing constraints. It is time to reestablish a reasonable regulatory framework that will protect consumers and ensure that high-quality telecommunications services are available to all Californians at reasonable rates.

v Price cap plans have typically relied on inflation as measured by the Gross Domestic Product Price Index (GDPPI).

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Introduction

In the not too distant past, a typical California household purchased local telephone service from a monopoly telephone company, perhaps embellished with a few vertical features such as call waiting or voice mail.[1] California consumers paid regulated rates for local service that ensured that market power was not exercised by the monopoly provider of telephone service. Because of the limits of consumer choice, price regulation protected consumers.

However, California consumers, like consumers around the nation, have adopted a growing variety of telecommunications services. In addition to local telephone service, many consumers have also added wireless mobility services, and broadband Internet access to their overall telecommunications market basket. National surveys indicate that about 60% of households purchase both wireline and wireless telephone service.[2] In addition, a high percentage of California households now have broadband.[3]

While California consumers certainly do make more choices among the variety of telecommunications services that are available, it is important to note that consumers still place a high value on the functions offered by local telephone service. The fact that only 9% of California households have "cut the cord" and abandoned wireline service indicates that wireline service must provide value to consumers.[4] Recent rulings by the Federal Communications Commission (FCC) also point to the fact that substituting wireless service for wireline is limited to a "small portion of households."[5] It is clear that the capabilities offered by wireline local telephone service continue to be viewed as important to California consumers, as supported by the fact that a large number of California households continue to purchase wireline local telephone service.[6]

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1 In addition, consumers in this not too distant past selected long distance services from competing long distance providers.

2 According to these surveys, about 20% of household purchase wireline service, but do not purchase wireless, and about 17.5% of households are wireless only. See, "Wireless Substitution: Early Release of Estimates From the National Health Interview Survey, January-June 2008," Stephen J. Blumberg, Ph.D., and Julian V. Luke. Division of Health Interview Statistics, National Center for Health Statistics. http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless200812.pdf TURN's recent survey also finds that about 60% of California households purchase both wireless and wireline telephone services. TURN Survey, "Final Weighted Toplines."

3 According to the most recent data available from the FCC, about 80% of California households purchase "high-speed" data services. However, because of the FCC's definition of "high speed," interpreting this statistic is difficult, as differences in the data speeds may categorize poor quality data services with those that achieve higher quality. For FCC data, see FCC Broadband Report, Table 13, that reports 9.3 million residential "high-speed" connections in California as of December 2007. The Census Bureau estimates that there were 12.2 million households in California in 2007.

Other reports show that Hispanics and low-income individuals lag in broadband adoption. See, "Latinos Online: Hispanics with lower levels of education and English proficiency remain largely disconnected from the internet." Pew Internet and American Life Project, March 2007. See also, "Broadband for All? Gaps in California's Broadband Adoption and Availability," Public Policy Institute of California, July 2007.

4 Blumberg, S., Luke, J., Davidson, G., Davern, M., Yu, T., Soderberg, K., "Wireless Substitution: State-level Estimates From the National Health Interview Survey, January–December 2007," March 11, 2009, p. 5. *http://www.cdc.gov/nchs/data/nhsr/nhsr014.pdf*

5 "In the Matter of High-Cost Universal Service Support Federal-State Joint Board on Universal Service; Alltel Communications, Inc., et al. Petitions for Designation as Eligible Telecommunications Carriers; RCC Minnesota, Inc. and RCC Atlantic, Inc. New Hampshire ETC Designation Amendment," WC Docket No. 05-337, CC Docket No. 96-45 Order, May 1, 2008, ¶29.

6 A recent survey conducted by TURN shows similar preferences in California, with more than 80% of respondents identifying their local telephone as their primary telephone, and further stating that many of the features and characteristics of wireline local telephone service continue to be viewed as important to California consumers. TURN Survey, "Final Weighted Toplines."

LOCAL TELEPHONE SERVICE REGULATION AND COMPETITION

The California Public Utilities Commission (CPUC) has determined that "competition" is sufficient to protect California consumers from market power. Unlike most other states that continue to cap basic service rates, the CPUC believes that competition is robust for those who purchase local telephone service alone, for those who purchase basic service combined with vertical features of their choice (à la carte buyers), or for those that purchase as part of a package of services.[7] As a result of CPUC decisions, California consumers will soon have most regulatory protections removed, and "market forces" will determine the prices that consumers are charged for basic telephone service. In their 2006 decision to eliminate price caps for basic telephone service the CPUC stated:[8]

> [T]he ubiquity of the FCC unbundling policies limits the market power of AT&T, Verizon, SureWest, and Frontier. Cross-platform competition, particularly that from wireless and VoIP technologies, provides an additional check that reduces market power of each carrier. Also Verizon and SureWest have demonstrated the presence of competitors throughout their entire service territories. Thus, a geographically specific analysis of policy and competitors makes clear that the ILECs (incumbent local exchagne carriers)[9] no longer possess market power.[10]

Thus, given the market setting that was evaluated by the CPUC in the 2005/2006 period, the Commission determined that market forces would protect consumers because of (1) FCC unbundling policies, and, (2) wireless and voice over Internet protocol (VoIP) competition. In addition, the CPUC found that evidence supplied by Verizon and SureWest supported the proposition that competition was geographically widespread.

In the two and one-half years since the Commission issued its decision, there have been significant changes in the marketplace that have an impact on the CPUC's conclusions. As will be discussed in detail below, there is substantial evidence that "competition" based on the FCC's "unbundling policies" has dramatically decreased. There are now over 1.1 million fewer traditional competitive local exchange carrier (CLEC) lines[11] in service compared to the 2004 peak, a decrease of over 50%.[12] Furthermore, there is substantial evidence that the ILECs do not face facilities-based alternative providers "throughout their entire service territories." Finally there is also substantial evidence that wireless and over-the-top VoIP technologies do not offer the overwhelming majority of consumers a reasonable means to substitute for the local telephone

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7 This report will use the term "package" to identify the combined marketing of related complementary services as a single product, e.g., local telephone service combined with long distance services, Call Waiting, Caller ID, and Call Forwarding. The term "bundle" will be used to describe the combined marketing of products that have lower degrees of complementarity, e.g., voice services and video programming.

8 The CPUC's "uniform regulatory framework" (URF) decision will eliminate price caps on local telephone services, including basic service, and will also allow telephone companies to "deaverage" their rates. Rate deaveraging means that telephone companies can target rate changes in specific areas, as opposed to having one price statewide. The CPUC has also reduced reporting requirements—eliminating previously required reports on the operations of local telephone companies.

9 The CPUC's action affects the four largest local telephone companies operating in California: AT&T, Verizon, SureWest, and Frontier.

10 D.06-08-030 at 132. The Commission continues to reiterate this position. See, for example, Decision 08-09-042, at 10.

11 As will be discussed further below, this report refers to firms that either resell incumbent local exchange carrier (ILEC) services, or rely on unbundled elements as "traditional CLECs." Following passage of the Telecommunications Act of 1996 CLECs were able to start up operations in any state, and relied on the network unbundling and resale provisions of the 1996 Act. While a few of these companies built networks to serve business customers, the Act's unbundled network element and local service resale provisions were the primary means by which residential competition emerged.

12 Data on CLEC line counts from "Selected RBOC Local Telephone Data" for the period December 2004 to December 2007. December 2007 is the period for which the most recent data is available. *http://www.fcc.gov/wcb/iatd/comp.html*

services available from ILECs.[13] There are numerous reasons to believe that because of these limitations on choice, market forces are not sufficient to protect consumers from market power.

COMPETITION AND CHOICE— WHAT PROTECTS CONSUMERS?

Consumers make purchases in a wide variety of markets without the protection of price regulation. In these markets consumers can choose from a variety of sources of supply, and it is this choice that provides discipline to market sellers. If a consumer does not like the price or service quality of one seller, he or she will simply choose another alternative. For example, consider consumer choice in the market for restaurant meals. The prices of restaurant meals are not regulated by the government.[14] When considering the purchase of a restaurant meal, consumers face a substantial array of choices, and this ability to choose from multiple sources of supply disciplines the market, thus limiting the ability of suppliers of restaurant meals to exercise market power.[15]

Consumer choice in the market for restaurant meals is multidimensional. For example, consumers may choose from full service restaurants, where customers are served by a waiter or waitress; "fast-food" restaurants, where consumers have limited service, but can eat on the premises; or restaurants that specialize in take-away, and offer no seating. Beyond the choice of restaurant "style," consumers are likely to have an ample array of choices from among major chains or locally-own proprietorships. For example, focusing on the Sacramento area, according to the Census Bureaus' Zip Code Business Patterns for 2006, in Sacramento City there were nearly 1,100 restaurants operating.[16] Map SR-1, on the following page, shows the distribution of these restaurants by Zip Code area. It is clear from this map that consumers in the Sacramento area have, within each Zip Code area, the ability to choose from multiple alternatives. Of course, because consumers are likely to rely on a vehicle to reach a restaurant, the typical consumer in Sacramento has the ability to move between Zip Code areas, and thus faces hundreds of choices.[17] When compared to the market for local telephone services, the market for restaurant meals offers consumers an expansive array of choices, and these choices help constrain market power.

Competition, Packages, and Bundles

When shopping for telephone services, consumers are frequently confronted with service "packages." Service providers like AT&T California promote combinations of telephone services such as local and long distance calling, a number of vertical features like call waiting and Caller ID, and voice mail.[18] In addition to these packages of telephone services,

13 As will be discussed further below, voice over Internet protocol (VoIP) service can be obtained as a service from cable companies. In addition, companies like Vonage offer VoIP "over-the-top" of a consumers' broadband connection. This report finds that cable company VoIP provides a superior product than does overthe- top VoIP.

14 Of course, the restaurant industry is governed by state laws and local ordinances, and is regulated by state and local agencies regarding food preparation practices, cleanliness, and safety. For a review of recent California laws and regulations affecting restaurants, see material available from the California Restaurant Association. *http://www.calrest.org/go/CRA/?LinkServID=5B892CAC-E224-099C-BBB8469300903E3C&showMeta=0*

15 Market power exists if a firm, or firms, operating in a market have the ability to raise and sustain prices above the economic cost of production for an extended period of time. Market power, where it exists, results in consumers paying prices higher than the costs of production, thus resulting in a misallocation of society's resources, and unfairly transferring income from consumers to the owners of the firm or firms with market power.

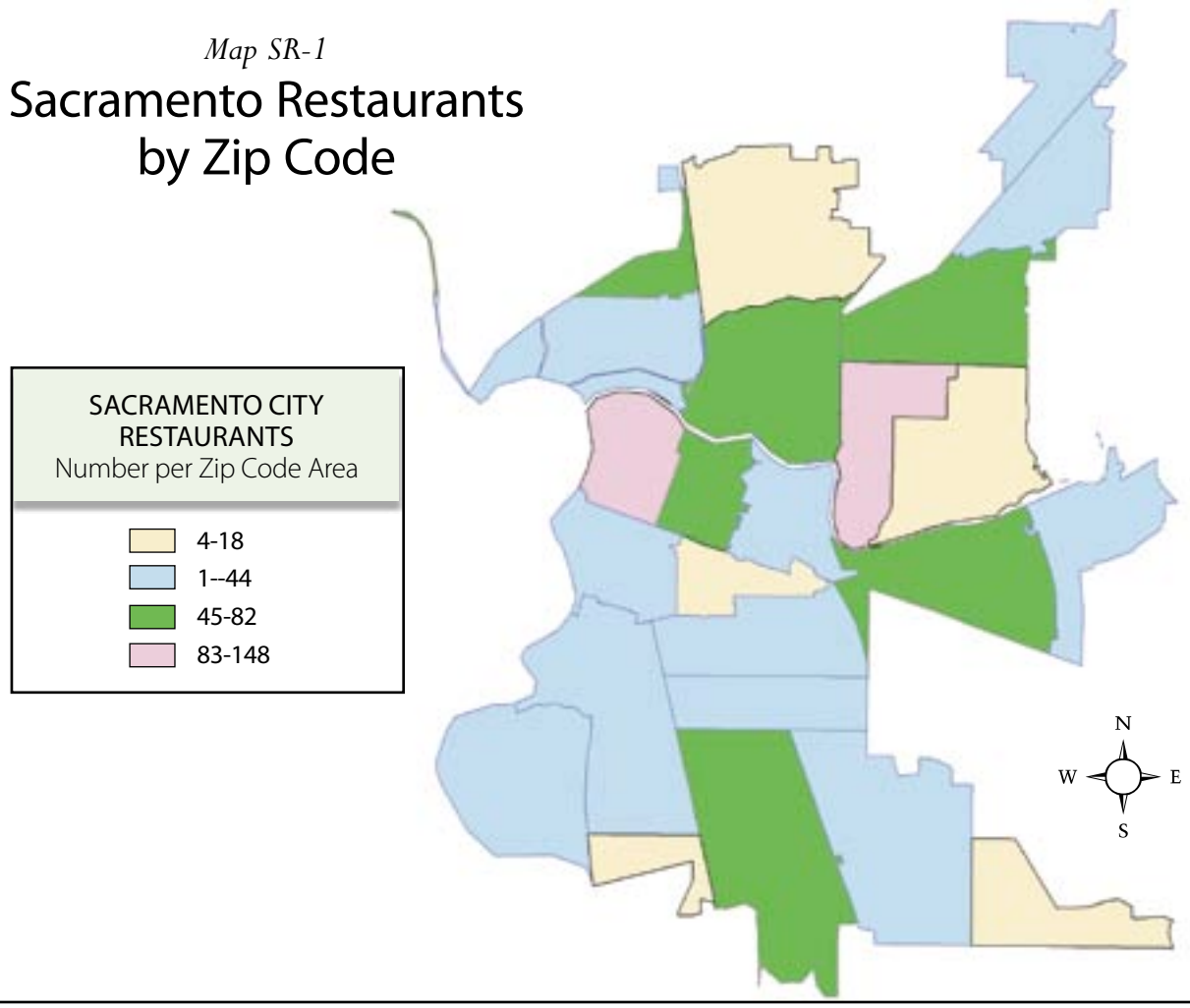
16 *http://www.census.gov/epcd/www/zbp_base.html*

17 A fuller economic evaluation of consumer choice when considering restaurant meals would also account for the fact that consumers can also choose to prepare their own meal with food acquired at a grocery store. The ability of consumers to purchase food that is in various stages of preparation from a grocery store further contributes to limits on market power of restauranteurs.

18 See, for example, AT&T's "All Distance" offer at: *http://www.att.com/gen/general?pid=10982*

Map SR-1

Sacramento Restaurants by Zip Code



consumers are also likely to find offers for "bundles" of services that are not as closely related as telephone calling and voice mail. Service bundles available to California consumers may include voice calling, video services, and broadband Internet access. While packages and bundles may offer "the convenience of one monthly bill," bundles and packages may be used by sellers to entice consumers to purchase more than they need.[19] It is also important to note that the telephone company's ability to up-sell consumers to packages is enhanced by telephone companies raising rates for à la carte options.[20] By raising à la carte prices telephone companies can "migrate" à la carte customers to expensive packages or bundles.

One important constraint on market power that is present in competitive markets is a limitation on the ability of firms to force consumers to purchase more than they want through bundles or packages. For example, while it is common to find packaged "combo meals" in fast-food restaurants, or "early bird specials" that combine entrée, beverage, and dessert in a sit-down restaurant, the forces of competition prevent restaurants from eliminating

19 A recent study by the Illinois Citizens Utility Board, based on individual phone bill analysis, found that many consumers have been "up-sold" by their local telephone company and purchase "expensive, all-you-can-eat phone packages—plans that provide unlimited calling and a host of extra features that are rarely used." See, "The Right Call: A $1.5 Billion Economic Stimulus Plan for Illinois," February 2009. *http://www.citizensutilityboard.org/pdfs/NewsReleases/20090210_stimulusreport.pdf*

Economists have also identified bundled service offerings a means of creating entry barriers, and deterring competition. See, Nalebuf, B. "Bundling as an Entry Barrier," The Quarterly Journal of Economics, February 2004, pp. 159-187.

20 Rate increases for à la carte telephone services is discussed in more detail in a later section of this report.

à la carte options.[21] If a restaurant eliminated à la carte options in an attempt to generate more revenues, rivals would recognize the opportunity to attract customers that desire à la carte options, and cater to those customers desiring à la carte. It is clear from experience with the restaurant industry that a "package-only" approach is not profitable for the overwhelming majority of restaurants. However, reasonably priced à la carte alternatives are disappearing from the local telephone service market,[22] this fact suggests that market power is present.

"Competition" for Local Telephone Services

Beginning in the mid-1990s, legal entry barriers were removed from the local telephone service market. However, it was widely recognized that the local telephone monopoly was not only the result of legal entry barriers. In addition, the causes of the local service monopoly included technical entry barriers, including the high cost of building an alternative network capable of delivering local telephone service. In 1996 the U.S. Congress passed the Telecommunications Act of 1996, that took the additional step of requiring local telephone companies to resell their services and underlying network technology.[23] The resale of both services and network facilities initially proved to be the most successful short-term component of the 1996 Act from the standpoint of generating consumer choice. However, because the resale option required that the competitor purchase some or all of their inputs from the incumbent telephone company, there was little room for vigorous competition. Facilities-based entry, where the incumbent facing rivals that had built their own networks, has the potential to deliver more vigorous price and quality competition to consumers—assuming that enough entrants can enter the market. In the thirteen years since the 1996 Act was passed, resale entry has experienced a "rise and fall." As a result, California consumers face few choices of local service provider, if they have a choice at all.

The Decline of Resale Alternatives

When deciding to eliminate price caps on local telephone services, including basic telephone service, the CPUC based the conclusion of statewide competition on the ability of competitive local exchange carriers (CLECs) to provide service through resale and unbundled elements.[24]

CLECs serving residential customers did not build their own facilities to reach consumers.[25] Instead, these companies rely on the technology and services controlled by ILECs. Following the implementation of the 1996 Act, the traditional CLEC industry grew in California. For example, by December of 2004, traditional CLECs served nearly 12% of residential lines in AT&T California's (then known as SBC) service area.[26] This growth in CLEC supply was driven largely by the expansion of the two largest long distance providers—the legacy

21 Transitory elimination of à la carte options is sometimes found with restaurant meals. For example, a popular restaurant may offer prix fix meals on an evening when high-volume is expected, for example, on New Year's eve. As a transitory occurrence, this would not suggest market power.

22 As will be discussed further below, prices for à la carte telephone features have been increased dramatically, making à la carte purchases much less attractive. Additionally, most alternative local service providers, such as cable companies,do not offer à la carte options.

23 The 1996 Act required that ILECs allow new entrants to purchase complete services for resale, or to purchase unbundled network elements (UNEs) from the local telephone company. This latter path enabled entrants with a business plan that called for use of both incumbent technology, and technology provided by the entrant. To simplify the discussion, I will refer to the resale/UNE entry approach as "resale."

24 D.06-08-030 at 132.

25 CLECs tended to gravitate toward the business market segment. Some CLECs that served business customers constructed their own facilities.

26 FCC, Selected RBOC Local Telephone Data, "RBOC Local Telephone December 2004.xls," available at: http://www.fcc.gov/wcb/iatd/comp.html"Resale" entry primarily impacted the California service areas of AT&T and Verizon. SureWest and Citizens/Frontier generally experienced much lower levels of resale-based entry.

AT&T, and MCI.[27] These firms utilized the 1996 Act's provisions to add local services to products sold to their existing long distance customers, as well as to sign-up new customers.

This success, however, was to be short lived. Due to a series of unfavorable court rulings, the ability of traditional CLECs to utilize ILEC facilities was undermined, and by early 2005 the traditional CLEC industry began a rapid descent.[28] By June of 2006, shortly before the CPUC issued its ruling to lift pricing constraints on local telephone services, the number of traditional CLEC lines had dropped dramatically.[29] Since then, CLEC lines have continued to drop. For example, in AT&T California's service area, traditional CLEC lines have declined from their December 2004 peak of 1.9 million to 815,000 in December 2007—a decline of more than 57%.[30] The residential and small business market was disproportionately affected by this decline—some CLECs built facilities to serve the large business market, and these firms have better weathered the storm surrounding the reduction in availability of wholesale elements provided by the ILECs to the CLECs. To evaluate the impact on the residential and small business market, consider the information reported by the FCC in Table 1, on the following page. Table 1 compares data from FCC reports for June 2004 and for the most recent period available, December 2007. Table 1 shows that CLECs that serve residential and small business customers now serve over 960,000 fewer lines, a decline of over 60%.[31] The elimination of UNE platforms was not offset by an increase in local service resale. Residential consumer choice has declined as the traditional CLEC industry contracted, with Verizon's acquisition of MCI, and SBC's acquisition of the legacy AT&T cementing the fate of the traditional CLEC industry.

Current Status of Resale Alternatives

In order to further evaluate the current status of the CLEC industry, especially for the residential market, CLECs continuing to operate in California were identified using the CLEC listing available on the CPUC web site and Internet search tools. This research confirms what general statistics available from the FCC show—the residential CLEC industry shrank dramatically following the elimination of UNE-P, and the mergers of the independent AT&T with SBC, and MCI with Verizon.

Research conducted for this report has determined that residential CLECs continue to operate, but that these firms have a limited presence, and a limited ability to constrain ILEC pricing. CLECs that currently appear to offer residential services are listed in Table 2, on the following page.

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27 In 2005 the long distance carrier AT&T was acquired by SBC Communications, Inc. Verizon acquired the long distance carrier MCI, also in 2005. Thus, the two largest CLECs operating in the state were acquired by the two largest ILECs in the state.

28 The 1996 required that ILECs make services available through resale, and to also provide piece-parts of their network technology to CLECs. These piece-parts are known as "unbundled network elements" or UNEs. In implementing the 1996 Telecommunications Act the FCC required UNEs be made available as a "platform" (or "UNE-P"), and the UNE-P was the option of choice for most CLECs that served the residential market. After the court challenges, the UNE-P was eliminated, and residential CLECs quickly faded thereafter.

29 The data available from the FCC regarding the status of the CLEC industry in June of 2006 was not released by the FCC until January of 2007.

30 Data for December 2007 is the most recent period available from the FCC. Also, the FCC data no longer reports whether lines are utilized for business or residential customers, thus the number of residential CLEC lines in AT&T California's service area is likely far below 815,000.

31 The December 2007 FCC data does not report what portion of UNE loops, platforms and resale lines are provided to residential and small business customers. The analysis in Table 1 applies the same proportions that the FCC reported for June 2004 to the June 2007 data. The data available from the FCC shows that CLEC lines in Verizon's California service area reached a peak of 445,000 in June of 2005, and have declined to 344,750 in December of 2007. However, most Verizon lines were provided to business customers. Data from: Selected RBOC Local Telephone Data, *http://www.fcc.gov/wcb/iatd/comp.html*

Table 1:
Change in Residential and Small Business CLEC Lines in AT&T California's Service Area

Period	Residential and Small Business UNE Loops and Platforms Sold by AT&T California to CLECs	Residential and Small Business Resale Lines
June 2004	1,554,300	48,224
December 2007	550,472	90,293
Net Change	-1,003,828	42,069

Overall Net Change in Residential and Small Business CLEC Lines in AT&T California's Service Area: -961,759

Table 2:
"Traditional" CLECs with marketing presence in California.

CLEC	Prepaid-Only?	Lowest Basic Rate	Unlimited Bundle	Notes
ACN Communication Services		$25.94	$38.99	AT&T and Verizon service area only.
Apex Telecom		$9.99		Residential retail service in AT&T service area. "Specializing in Bay Area." Appears to target Asian community. 800 number periodically not in service.
Asian American Association		$24.95		Targeting Asian American Community. $24.95 AT&T; $27.95 Verizon.
Blue Casa Communications		$27.99	$49.99	Targeting Hispanic Community.
Budget Phone (Budget Prepay)	Yes	$49.95	.	High-Priced Prepaid
Connectto	Yes	$27.99	$54.95	Specializing in Eastern European. Lifeline and "basic" service. $54.99 "unlimited" plan charges $0.049 per minute for domestic long distance.
Curatel	Yes	$14.40*	$29.40	High-Priced Prepaid. Markets Lifeline service "bundle" for more than double current LifeLine rates. Spanish language.
dPi Teleconnect	Yes	$39.99	$56.99	High-Priced Prepaid. AT&T, Verizon service area. "Unlimited" does not include toll. $10 discount for "prompt pay."
EarthLink		$49.95	$69.95	Bundles DSL and voice. Limited availablity.
Excel Communications		$39.95	$59.95	$39.95 to $59.95. Requires credit card billing. Price quote from service rep.
MCI		$41.99	$59.99	"Neighborhood" services still listed on web site. Available in AT&T service area.
Midwestern Telecommunications	Yes	$35.29	$40.29	High-Priced Prepaid provider. No toll service in "unlimited" bundle.
Phoneco	Yes	$29.99	$37.98	High-Priced Prepaid provider. Unlimited does not include toll.
PNG Telecommunications (Powernet Global)		$21.99	$39.99	Residential local service in AT&T service area. "Unlimited" bundle provides only 120 long distance minutes.
Sage Telecom		$24.99	$39.99	Limited to AT&T service area
TC Telephone		$16.99	$49.99	Limited to AT&T service area
Telscape		$24/$28	$47/$53	Residential Service (Hispanic marketing angle), AT&T/Verizon territory prices.
Trinsic		$59.68		Availability in AT&T and Verizon service areas.

*Price for LifeLine eligible customers. This price is roughly double the LifeLine rate available from an ILEC.

The research was able to confirm that the eighteen CLECs shown in Table 2 are at least offering services targeted at the residential market in California.[32] However, few of these CLECs offer consumers a reasonable choice, and most offer service at prices well above those available for basic service from an ILEC. For example, five of the CLECs shown in Table 2 that appear to be operating in California are high-priced "prepaid" providers. These "prepaid" companies target low-income consumers and offer high-priced prepaid local service, typically marketing their products at check cashing stores or other vendors concentrated in low-income areas. These high-priced prepaid providers do not represent a reasonable alternative to ILEC service offerings, and do not provide a competitive check on ILEC market power.[33]

Of the remaining 13 firms, many have limited operations, or marketing practices. Apex Telecom indicates that its operations are limited to the San Francisco Bay area, and appears to target the Asian community.[34] Asian American Association indicates that they offer service in AT&T and Verizon service areas. Two other service providers, Blue Casa Communications and Telscape, market their services targeting the Hispanic community. The companies shown in Table 2 may have limitations associated with their services that reduce their attractiveness to consumers. For example, PowerNet Global and Excel Communications offer no specific information for residential consumers on their web sites regarding which geographic locations their services are available. To discover whether service is offered in California, a customer representative must be contacted. Furthermore, PowerNet Global indicates that they do not have the ability to establish new service, an existing account with an ILEC is required. EarthLink offers voice service only bundled with DSL in areas of San Francisco, Los Angeles, San Diego, and San Jose, but tells customers that not all homes in these areas are serviceable, and that customers must have an active telephone account (i.e., no new subscribers can be processed).[35]

Use of Internet search tools that might be used by an individual shopping for telephone service, did not reveal a substantial CLEC marketing presence. Using Google and search terms like "local telephone service (city name, state)," or "telephone service (city name, state)" generally did not return results that included the firms shown in Table 2. Using other specific Internet sites, such as "allconnect.com" or "connectmyphone.com" also reveal a very limited presence of the CLECs shown in Table 2. Only Sage Telecom and the prepaid provider dPi Teleconnect were found to consistently appear in address-specific searches using these tools, and Sage Telecom was only found in areas served by AT&T. This indicates that a consumer searching for alternative sources of supply would be unlikely to uncover traditional CLECs through use of the Internet. It also indicates that the CLECs shown in Table 2 do not even bother to pay Google for page placement advertising.

All firms shown in Table 2 appear to have small scale operations. The California Public Utilities Commission's publishes a list of the 40 largest telecommunications providers operating in the state, and *only one* of the companies in the

32 The companies shown in Table 2 most frequently have operations in AT&T's service area. A smaller number also have operations in Verizon's service area. These is little evidence of these companies operating in SureWest or Citizens' service areas. In addition, this research has not been able to confirm that Apex Telecom is taking on new subscribers.

33 The California LifeLine program offers low-income consumers the ability to purchase basic local phone service at discounted rates. Some of the high-priced prepaid providers market LifeLine service bundles at rates well above current LifeLine rates.

34 Repeated attempts to contact this provider, either through its web site, its toll free number, or its local telephone number failed.

35 "EarthLink DSL & Home Phone Service is available in the following greater metropolitan areas: Atlanta, Chicago, Dallas, Los Angeles, Miami, New York City, Philadelphia, San Diego, San Francisco, San Jose, Seattle, and Washington, D.C. However, not all homes in these cities will be serviceable. Phone service requires that you transfer an active phone number to EarthLink." *http://www.earthlink.net/voice/*

Table 2, MCI, makes the list.[36] This is a strong indication that CLEC providers are not significant players in the residential market segment.

Other factors limit traditional CLEC's ability to discipline ILEC pricing:

- AT&T and Verizon sell basic service for rates ranging between $13.50 to $20.91 per month. The CLECs shown in Table 2 cannot compete with these prices as the inputs that they acquire from AT&T and Verzion cost more than basic rates. Furthermore, the CLEC prices are likely to rise as the ILEC prices rise.[37]

- Most residential CLECs offer only packages of services at prices well above current basic service rates. Most of these CLECs do not offer à la carte purchase options. The lack of à la carte options from these CLECs limits consumer choice.

- A major limitation on CLECs is their ability to attract new customers. CLEC advertising in the state and national media is virtually nonexistent. "Do not call" lists have substantially reduced telemarketing opportunities. Telemarketing once proved to be an effective method of growing CLEC business. Furthermore, as noted above, CLECs may not be able to sign-up consumers that do not have an existing account for telephone service.

In summary, the ability of traditional CLECs to offer consumers a viable choice, and to discipline the market power of incumbent service providers is doubtful. The limited success of the traditional CLEC industry in the 2000-2004 period was driven by a regulatory structure that enabled CLEC entry and marketing success. After the regulatory structure that enabled entry was dismantled, the residential CLEC industry collapsed, with the disappearance of many CLECs, including the two largest residential suppliers, MCI and the legacy AT&T, having a profoundly negative impact on consumer choice. The CPUC's conclusion that the "ubiquity of FCC unbundling policies" constrain ILEC market power is not supported by this data.

INTERMODAL ALTERNATIVES TO LOCAL TELEPHONE SERVICE

As discussed above, it is clear that the resale/unbundling competition enabled by the 1996 Act has declined dramatically since the CPUC made its decision to remove price caps. However, the CPUC also identified intermodal alternatives as providing a check on market power. The intermodal choices identified by the CPUC included wireless and VoIP services. It is important to consider whether these intermodal alternatives offer consumers choices that are consistent with market competition adequately protecting consumers.

Is Wireless a Reasonable Alternative?

In its Decision to lift pricing constraints on basic service the Commission stated "Wireless service is a substitute for wireline service,"[38] also stating "the build out of wireless carriers' networks since

36 The CPUC's "Top 40" list does not distinguish between business and residential customers served, thus the level of residential service provided by MCI it is not clear from the CPUC's Top 40 list.

37 The wholesale rates for ILEC services that are resold by CLECs are based on a percentage discount off of the ILECs' retail rate. Commercial agreements typically include price escalator clauses that increase the prices paid for UNE-P replacements on an annual basis.

38 D.06-08-030, Findings of Fact 39, p. 264.

this Commission's last major telecommunications regulatory review eighteen years ago has made wireless technologies a *close substitute* for landline services. This evidence is a significant factor in this decision."[39] In addition, the Commission stated: "The evidence available does not support the conclusion stated that wireless service is a complement to wireline service."[40] From an economic perspective, if these conclusions are correct, then market outcomes should reflect the alleged ease with which most consumers should be able to move between wireless and wireline services, and should show clear evidence of competition between wireless and wireline service providers.[41]

FCC Evaluation of Wireless/ Wireline Substitution

The FCC has recently evaluated wireless usage and concluded that most households do not find a wireless telephone to be a suitable substitute for wireline services. In a discussion of companies that receive support for providing service in high cost areas (companies known in FCC parlance as "eligible telecommunications carriers" or ETCs), the FCC notes that:

> These wireless competitive ETCs do not capture lines from the incumbent LEC to become a customer's sole service provider, except in a small portion of households. Thus, rather than providing a complete substitute for traditional wireline service, these wireless competitive ETCs largely provide mobile wireless telephony service in addition to a customer's existing wireline service.[42]

This conclusion is a powerful statement regarding the "competitive" characteristics of wireless services vis-à-vis wireline services. If consumers cannot easily replace wireline service with wireless, then consumer choice is limited, and wireline providers will not face significant pricing discipline due to the existence of wireless services. However, the FCC findings are not the only evidence that wireless services do not provide a competitive alternative for most households.

Wireless Signal Strength, Coverage and Substitution

The service quality associated with wireless offerings may make substitution of wireless for wireline impractical for many consumers. Wireless coverage varies depending on the carrier's network facilities, and other factors, such as the location of the customer, terrain, foliage, and buildings. Most wireless carriers inform their customers that the ability to make a call indoors is not a guaranteed feature of their service. For example, AT&T Wireless publishes signal strength maps that describe service availability in terms of the ability to receive indoor coverage. Diagram 1, and Diagram 2, on the following page, show AT&T coverage maps for residential neighborhoods in Redding, in Shasta County, and in Sacramento.

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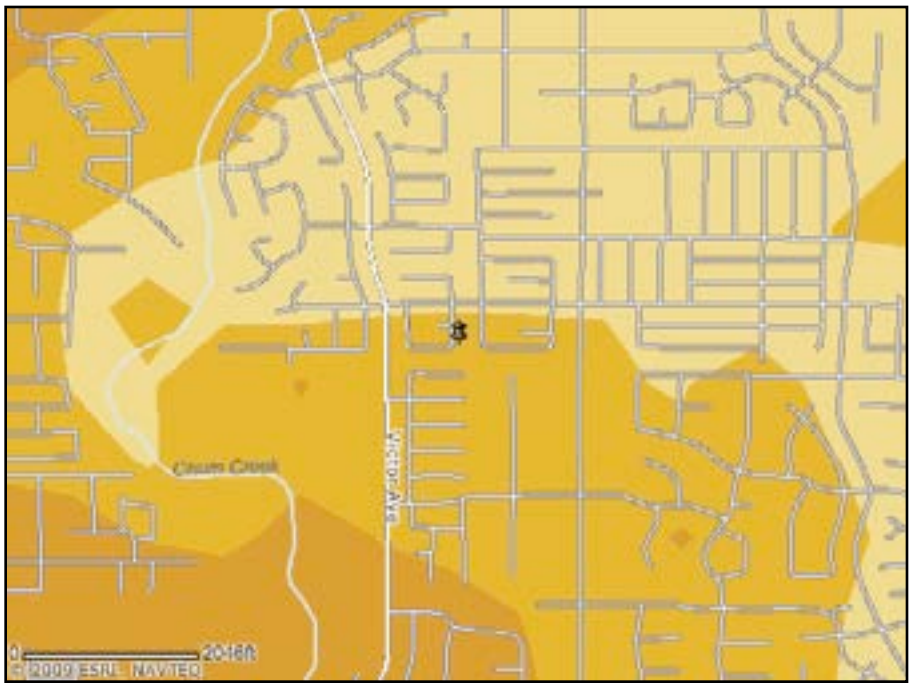
39 D.06-08-030, p. 120, emphasis added.

40 D.06-08-030, p. 264.

41 It is important to note that the two largest wireless service providers in California, AT&T Wireless and Verizon Wireless, are also the two largest providers of wireline local telephone services. Thus, these companies have an interest in managing any "competition" that may occur between wireless and wireline telephony. This issue is discussed in more detail below.

42 "In the Matter of High-Cost Universal Service Support Federal-State Joint Board on Universal Service," WC Docket No. 05-337, CC Docket No. 96-45. Notice of Proposed Rulemaking, January 29, 2008, FCC-08-4, ¶9. The FCC reiterated this conclusion "In the Matter of High-Cost Universal Service Support Federal-State Joint Board on Universal Service; Alltel Communications, Inc., et al. Petitions for Designation as Eligible Telecommunications Carriers; RCC Minnesota, Inc. and RCC Atlantic, Inc. New Hampshire ETC Designation Amendment," WC Docket No. 05-337, CC Docket No. 96-45 Order, May 1, 2008, ¶29.

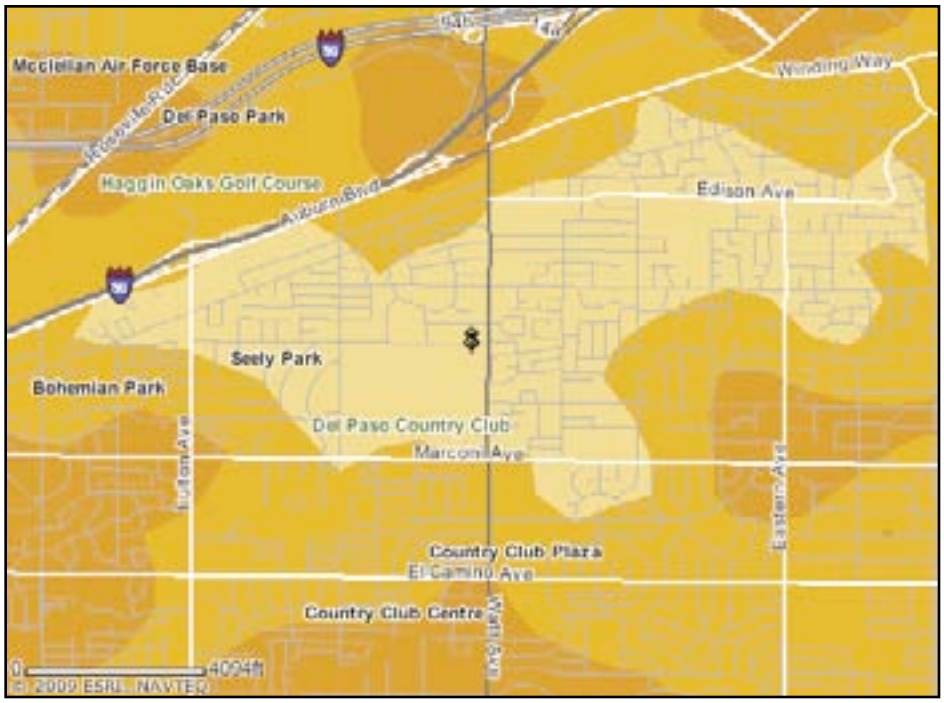


AT&T offers the following interpretation of the signal strength identified in the maps:

DARK ORANGE—BEST: In general, the areas shown in dark orange should have the strongest signal strength and be sufficient for most in-building coverage. However, in-building coverage can and will be adversely affected by the thickness/construction type of walls, or your location in the building (i.e., in the basement, in the middle of the building with multiple walls, etc.)

MEDIUM ORANGE—GOOD: The areas shown in the medium orange should be sufficient for on-street or in-the-open coverage, most in-vehicle coverage and possibly some in-building coverage.

LIGHT ORANGE—MODERATE: The areas shown in the light orange should have sufficient signal strength for on-street or in-the-open coverage, but may not have it for in-vehicle coverage or in-building coverage.



These maps and their disclaimers reinforce the fact that wireless carriers do not design their service to ensure indoor coverage, even in a high-density urban area, such as the 95821 Zip Code in Sacramento. Similar results are found for the other major wireless carriers that publish coverage maps that depict signal strength variation. It should also be noted that in more rural areas, wireless coverage is much less robust, and may be nonexistent.[43]

National Health Interview Survey Data on Wireless Substitution

As the CPUC correctly recognized, for market prices to be disciplined by competition, services must be "close substitutes." Recent data from the National Health Interview Survey (NHIS) shows that only about 9% of California households have cut the cord and gone wireless only.[44] This is a strong indicator that the outright replacement of wireline with wireless service is difficult for most California households. If there are demographic factors, or other characteristics of a household that systematically influence consumer choice (such as age, income, or the presence of an individual with a disability or poor health), then the proposition that wireless is a close substitute for the general population is not reasonable. If wireless and wireline services are in fact "close substitutes" for all Californians, then it would be surprising to find that numerous demographic factors have an impact on consumers' choice of whether or not to go wireless only.

In order to evaluate the ability of consumers to substitute between wireline and wireless services, a study of data on consumer choice and consumer characteristics was conducted. The empirical analysis of consumer choice supports the FCC's conclusion that most consumers find it difficult to substitute wireless for wireline service. The study, discussed in more detail in Appendix B, identifies factors that have a statistically significant impact on the decision to refrain from purchasing wireless-only service. A brief summary is provided below.

Summary of NHIS Study

In order to evaluate substitution between wireless and wireline service, a regression analysis was conducted using the 2007 National Health Interview Survey (NHIS) data.[45] The NHIS is performed by the Census Bureau on behalf of the Centers for Disease Control and Prevention. This survey is conducted through face-to-face interviews. This avoids the problem of telephone surveys, that may not reach wireless-only households. In recent years the NHIS survey has been modified to include more detailed questions regarding telephone usage. This information is reported alongside other information regarding household characteristics, including standard demographic information and detailed health-related information. This additional information can be combined with the telephone usage information to support statistical analysis of factors that influence household decisions regarding telephone service. The data set allows the households' choice of telecommunications services to be categorized into one of four categories: No Telephone Service; Wireless-Only; Wireline-Only; or Both Wireless and Wireline. Table 3, on the following page, shows the percentage and number of records that reflect each type of service choice.

43 The only available information regarding wireless coverage is from wireless carriers. These carriers have few incentives to reveal deficient coverage.

44 Blumberg, S., Luke, J., Davidson, G., Davern, M., Yu, T., Soderberg, K., "Wireless Substitution: State-level Estimates From the National Health Interview Survey, January–December 2007," March 11, 2009, p. 5. *http://www.cdc.gov/nchs/data/nhsr/nhsr014.pdf*

45 This report relies on full-year data available from the CDC for 2007. Partial-year summary information for 2008 has been released by CDC, but the full 2008 data set will not be released until mid-2009. Summary results reported by the CDC for the partial 2008 data are consistent with the results observed for 2007.

Table 3:
NHIS Survey Results—Household Choice of Telephone Services

No Telephone Service	Wireless-Only	Wireless-Only	Both Wireline and Wireless	Telephone Households	Telephone Households with Wireline Telephone	Percent of All Telephone Households that Have Wireline Telephone
(A)	(B)	(C)	(D)	(B)+(C)+(D)	(C)+(D)	$\frac{(C)+(D)}{(B)+(C)+(D)}$
676	4,527	6,839	16,757	28,123	26,678	83.9%

The data in Table 3 indicate that in 2007, 83.9% of telephone households nationwide (i.e., those households that have telephone service), have a wireline telephone.[46] This statistic in and of itself is a reasonable indicator of whether wireless is viewed as a substitute by most households. The fact that such a high percentage of households surveyed continue to maintain wireline service suggests that wireless service does not act as a "close substitute" for wireline service. The fact that 83.9% of telephone households nationwide maintain wireline service indicates that there must be characteristics of the service that wireless cannot supply, making it difficult to substitute wireless for wireline outright. Given that California is well below the national average for "cord cutting," it is likely that an even higher percentage of California households continue to maintain wireline service.

Factors that Reduce "Cord Cutting"

If it is the case that wireless and wireline services are close substitutes, as the CPUC believed when it made its decision to remove price caps on local telephone service rates, then there should not be significant and systematic differences in the types of individuals that are observed to use only wireless service. The regression analysis conducted using the NHIS data shows, however, that there are systematic differences in the characteristics of households with regard to the decision to go "wireless-only." The following are statistically significant factors shown to *decrease* the probability that a household will be wireless-only:

- Age of household head
- Race of household head
- Larger size of the household
- Home ownership
- Marriage
- Presence of individuals with health problems
- Presence of individuals with a disability
- Higher income levels[47]

These statistically significant factors suggest that while it is the case that we observe that a portion of households have "cut the cord" and gone wireless-only, it does not follow that wireless telephony is a widely acceptable substitute for wireline local telephone service—there are numerous countervailing factors that make the ability to substitute more difficult.

46 The NHIS also reports that 30% of households are "wireless mostly." "Wireless mostly" is defined by the CDC researchers as households that have both wireless and wireline service, but where the survey respondent receives most of their calls on a wireless telephone. This statistic is of interest when trying to understand the impact of wireless adoption on telephone surveys, which is one of the objectives of the NHIS. It should be noted that there is an inherent bias in this statistic, as a household may have multiple wireless accounts, but is likely to have only one wireline account—the number of calls coming to the individual wireless users is more likely to exceed the number coming to the single wireline. However, the fact that all of the "wireless mostly" households continue to maintain a wireline telephone indicates that there must be some value to those households of having a wireline telephone. This value may come from the ability to place calls more cheaply than with a wireless telephone, or it may be related to other factors that are discussed further below. In summary, from the standpoint of evaluating competition, "wireless mostly" does not present a persuasive data point.

47 Likewise, the analysis supports reports that wireless-only households are most commonly single male, renters, with low income. "Today's cord-cutters remain distinct from the average mobile user: They earn less, are more likely to be single males younger than 35, and are less well-educated." Forrester Research Report, "Cord Cutting Grows into the U.S. Mainstream," March 30, 2006. It should be noted that while it is commonly observed that college students rely on wireless telephones, from a demographic perspective, they will be tabulated as having less education than, say, a college graduate.

Household Income and Cord Cutting

One of the findings of the study indicates that households with higher income levels are less likely to be wireless-only. This result suggests that with the economic downturn, and declining consumer incomes, more consumers may decide to drop their wireline service. Should this occur, the rise in wireless-only households does not reflect growing competition, but instead reflects an income effect on the household's purchase decision. If incomes decline, consumers' choices may change as a result of the income effect. For example, during an economic downturn and falling consumer incomes, households will consume more canned meat and less fresh meat. The fact that consumers eat more canned meat instead of fresh meat as incomes decline does not suggest that competition between fresh meat and canned meat has intensified, but instead suggests that declining incomes lead to the substitution out of economic necessity.

A similar conclusion can be drawn regarding the decision to abandon wireline as consumer incomes fall. Given the fact that wireline service provides telephone service to all members of a household, growing reliance on wireless due to declining incomes generates a policy problem, as overall telephone service is degraded when a household drops its wireline service—not all household members may have access to a telephone. Rising rates for basic service may exacerbate the income-driven cord cutting activity.

Verizon recently announced that it may consider offering limited wireline service for $5 per month. Press reports indicate that the action is in response to the economic decline, and links that decline to the abandonment of wireline service.[48] However, the Verizon $5 service only allows consumers to receive calls and to only dial-out to emergency services and Verizon customer service. Furthermore, the press reports indicate that the plan would only be available to consumers that also purchase Verizon broadband services. This pricing response may buck the trend of rising basic rates, however, the fact that the $5 service envisioned by Verizon places substantial limits on calling, and may only be available as part of a bundle, suggests a market segmentation strategy, rather than a broad competitive pricing response. As the *Wall Street Journal* notes:

> The strategy would come with some risks. If too many customers opt for the low-cost voice plans, they would cannibalize revenue from more expensive landline plans. Verizon's unlimited nationwide home-phone plans start at $40 a month. The company isn't planning to advertise the new plans widely, but rather to make the offer only to those who threaten to cut their landline service.[49]

Thus, Verizon recognizes that cord cutting is likely to impact only certain customers, and the trick will be determining which customers are at risk. By making the $5 offer to a customer who is calling to disconnect service, Verizon may be able to entice cash-strapped consumers to retain a low-grade wireline telephone, which is a desirable outcome as it keeps the household connected to high-quality emergency services. But the Verizon strategy also illustrates that Verizon does not perceive the threat posed by cord cutting to rise to the level of requiring an across-the-board pricing response, or even rise to the level of promoting a low-priced wireline à la carte offering. Finally, this example clearly illustrates that companies like Verizon and AT&T, that provide both wireline and wireless services, are interested in managing any "competition" that may exist between wireline and wireless.

48 "Verizon May offer Landline Plan for $5," Wall Street Journal, February 17, 2008.
http://online.wsj.com/article/SB123483395304696039.html

49 Ibid.

Summary of Wireless Substitution

In summary, with regard to wireless service, the evidence indicates: (1) for a limited subset of the population, a wireless phone can replace wireline, (2) for a large segment of consumers, wireless is used in a complementary fashion with wireline—both services are purchased, (3) for the overwhelming majority of households with any telephone service, the value of functions provided by a wireline telephone leads to the purchase of this service, and (4) the economic downturn may lead to more households abandoning wireline out of economic necessity.

The discussion above supports the proposition that wireless service is not a "close substitute" for wireline for most customers. Wireless substitution is unlikely to provide a pricing constraint on local telephone company services, as wireless plans are much more expensive than wireline service. Telephone companies have experienced residential line losses for some time, due to wireless substitution, broadband adoption, and rivalry from cable providers.[50] Thus, the observed pricing strategies of raising residential wireline rates already incorporates knowledge that some consumers are abandoning wireline service and relying on wireless alone. For most consumers, replacing wireline with wireless is not a viable choice, and as a result, the availability of wireless services is not constraining wireline rate increases.

Intermodal Alternatives—VoIP

In deciding to remove price caps for local telephone service, including basic local exchange service, the CPUC also identified voice over Internet protocol (VoIP) as an additional constraint on ILEC market power. VoIP services can be obtained in one of two ways. The first VoIP alternative, often called "over-the-top" VoIP, requires that a consumer purchase a broadband Internet connection, and then utilize a VoIP provider that is unaffiliated with the broadband provider. The largest over-the-top VoIP provider is Vonage. The other avenue through which a consumer can acquire VoIP service is from their broadband provider. Cable television companies, and overbuilders,[51] have upgraded some of their facilities to provide VoIP service. This section of the report will examine the availability of VoIP services, and whether these services adequately contribute to the control of ILEC market power.

Over-the-Top VoIP

The CPUC, in its decision to remove price caps for basic local services, pointed to the existence of over-the-top VoIP providers, such as Vonage, as another source of competitive supply. To utilize over-the-top VoIP, a consumer must purchase a broadband connection, which, should the household not have broadband, considerably increases the cost of purchasing over-the-top VoIP. Alternatively, if broadband is not available where a consumer resides, over-the-top VoIP is not an option.[52]

VoIP services are provided using packet-switched technology, as opposed to the conventional circuit-switched technology associated with the legacy telephone network. As a result, VoIP service has limitations that may reduce its desirability as a substitute for basic telephone service. One significant limitation of VoIP service is its need for electric power to operate. Unlike the legacy telephone network, that features reliable backup power systems, VoIP services

50 AT&T InvestorBriefing, January 28, 2009, p. 14.

51 Overbuilders are firms that have extended facilities in areas that are already served by a cable company. Overbuilders may be existing cable companies that extend facilities into an adjacent area that is not covered by their traditional franchise, or a new company. See Appendix A for further discussion.

52 While the research associated with this report did not explicitly check for the availability of broadband service, the presence of facilities-based VoIP, such as that provided by cable companies, requires that the cable operator's network be broadband capable. Comparing the maps in Appendix A that report on the availability of cable VoIP services to the broadband availability maps prepared by the California Broadband Initiative shows similar coverage. See maps available at: *http://www.calink.ca.gov/taskforce/appendix_maps.asp*

may not offer similar protection. Over-the-top VoIP providers necessarily rely on broadband services that the consumer purchases from another company, and do not provide back-up power sources. Even if the VoIP provider did provide a back-up power source, there would be no guarantee that the underlying broadband network (that is not controlled by the over-the-top VoIP provider) would operate in the event of a power outage. Because the broadband service is one element of service, a subscriber may be susceptible to "finger pointing" in the event of trouble with the VoIP service.[53]

Another limitation of VoIP services relates to 911 services. Over-the-top VoIP services offer more limited 911 features, and are less likely to be compatible with E911. Where over-the-top VoIP providers do have 911 capabilities, consumers are typically required to inform the provider of the address to which emergency personnel should be dispatched, as VoIP providers do not track the specific location from which their service is being used. Consumers must also keep this information updated.

The over-the-top VoIP industry has struggled given the rise of cable-based VoIP providers. Cable-based VoIP typically offers superior VoIP services, including some degree of battery back-up and the possibility of E911, that over-the-top VoIP providers cannot match. Vonage, the over-the-top VoIP industry leader, has experienced substantial setbacks, including successful patent-infringement litigation brought by Verizon, and stagnating customer growth.[54] According to TURN's survey, about 2% of respondents reported using Vonage as their primary home telephone connection. This indicates that over-the-top VoIP service has not been widely adopted by consumers, and is unlikely to provide a reasonable substitute for local telephone services provided by the ILEC.

Emerging VoIP-Based Services

T-Mobile, a wireless carrier operating in California, has recently introduced a product called "@Home" that links over-the-top VoIP calling with a T-Mobile customer's wireless calling plan. To use @Home, a consumer must purchase a T-Mobile wireless plan, and must also have broadband service, and must install a wireless router.[55] While the T-Mobile @Home service presents a novel approach to marketing VoIP service, the service has the same limitations as other over-the-top VoIP products, and may not be a reasonable alternative for many consumers. It is also notable that because T-Mobile has no wireline affiliate, that this company has no concerns regarding cannibalization of existing wirelines. Other wireless carriers, such as AT&T and Verizon have wireline affiliates, and thus have to consider the impact of marketing a similar product on use of their wireline products.

For example, Verizon is currently in the early stage of marketing a new product called "Hub." This "new home phone,"[56] will be marketed by

53 I.e., the VoIP provider may indicate that a problem experienced by a consumer is with the broadband provider, and out of the VoIP provider's control.

54 Vonage reports a decline in customers in its operating results for December 31, 2008, the first decline in its operating history. Vonage also reports that its monthly "churn" rate is 2.9%, which indicates that it loses about 35% of its customer base each year. Vonage identifies its marketing costs per gross customer addition of $309.10. Given these statistics, whether Vonage will be sustainable is questionable. See, Vonage Form 8-K: *http://www.sec.gov/Archives/edgar/data/1272830/000119312509038168/dex991. htm* See also, for example, "Just how bad can things get at Vonage?" FierceVoIP, March 24, 2008. *http://www.fiercevoip.com/story/just-how-bad-can-things-get-at-vonage/2008-03- 24*

55 The @Home service does not utilize the customer's cell phone, and T-Mobile encourages prospective @Home users to purchase a separate T-Mobile cordless phone that T-Mobile indicates provides superior performance with the @Home system. *http://www.t-mobileathome.com/#/about-at-home/faqs.aspx*

56 "Verizon Web Phone Targets Home Users," Wall Street Journal, January 23, 2009, http://online.wsj.com/article/SB123267041054808307.html

Verizon Wireless, and will rely on a broadband connection, and interact with Verizon wireless telephones. Verizon sees the product as a means to "retain existing landline customers."[57] Similarly, AT&T has introduced its "Home Manager" that offers similar features, but does not rely on VoIP, and integrates broadband, traditional wireline, and wireless calling.[58] Similarly, Verizon has also recently released a product that boosts cell coverage in one's home, that also requires a broadband connection. However, this device, unlike the T-Mobile @Home service, does not offer unlimited calling, but simply improves signal strength, and requires the customer to use their wireless calling plan.[59] This marketing strategy does not provide a price incentive to abandon wireline service, as flat-rate local calling is an attractive component of basic telephone service.[60] Verizon Wireless' $250 price tag for the device does not point to a penetration pricing strategy on Verizon's part. These AT&T and Verizon service offerings, as they are being offered by an integrated provider of wireless and wireline services, are unlikely to restrain these same carriers' local service pricing policies.

Availability of Facilities-Based VoIP—Cable and Wireless

While traditional CLEC service provided to the residential market has dramatically declined, cable-provided VoIP service has expanded since the CPUC decided to remove price caps for local telephone services. Cable voice services, often provided using VoIP,[61] generally offers a superior voice service than does over-the-top VoIP, and typically offers some form of battery backup, and offers more conventional 911 services. However, even cable VoIP service may be incompatible with functions that can be provided using conventional telephone service. For example, Time Warner Cable, which offers VoIP service in much of its California service area, screens service applicants with questions regarding whether the prospective consumer utilizes Tivo or satellite television. These services require a dial-up connection to operate, and Time Warner advises:

> (Time Warner's) Digital Phone does not currently support dial up connections, including Tivo and satellite customers. If you need a dial up connection, you should keep a low cost traditional phone line.[62]

Thus, Time Warner tells its prospective customers that they may have to continue to use the traditional phone system. Furthermore, VoIP systems may also be incompatible with alarm monitoring systems.[63] Similarly, home healthcare monitoring systems are also typically dependant on legacy telephone technology, and may not work with a VoIP

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57 Ibid.

58 See the product description available at *http://www.wireless.att.com/homemanager/userGuides.jsp?wtSlotClick=1-0016I A-0-1&WT.svl=calltoaction*
AT&T no longer accepts new customers for its VoIP service.
http://www.usa.att.com/callvantage/consumer_redirect.jsp

59 *http://www.verizonwireless.com/b2c/store/accessory?action=gotoFemtocell*

60 For example, 89% of survey respondents associated with TURN's survey regarding attitudes toward telephone services stated that the ability to make an unlimited number of local calls for a flat rate was either very important or important. TURN Survey, "Final Weighted Toplines," p. 4.

61 Cox Communications, which introduced voice services in California earlier than most other cable providers, initially utilized conventional circuit-switched voice services. See, for example, article by Cox's Chief Technology Officer Chris Bowick "Cox Shares Trial Results and Engineering Strategies," Communications Technologies, June 1, 2003. *http://www.cablefax.com/ct/sections/features/15046.html*
However, beginning in 2005 Cox announced plans to migrate to VoIP. See, "VON: Cox Announces VoIP Plans," TelephonyOnline, March 7, 2005.

62 *https://ecare.timewarnerla.com/allnone/popups/pop_digPhoneVerify.cfm?homeAlarm=no&dialUp=yes&DSL=no*

63 The author of this report discovered this fact when switching his business telephone service to Comcast. A standard telephone line is required by his alarm company to operate their service, and as a result, the switch to Comcast did not result in the discontinuance of Verizon's legacy telephone service.

system.[64] Thus, cable VoIP technology may not be an option for all consumers. In addition to facilities-based VoIP services provided by cable television companies, Clearwire, a wireless facilities-based broadband and VoIP provider, has begun operations in limited areas of the state.[65] Clearwire's voice product is only available as part of a bundle with high-speed Internet service, and is priced about $55 per month, and requires a one- or two-year contract. Clearwire's service is more similar to over-the-top VoIP than to cable-based VoIP, as no battery back-up is provided, and 911 service set-up is the responsibility of the customer.[66] Clearwire's service, because it is a wireless service may be subject to interference, and may not be available in all areas due to variations in terrain, or other factors.[67] Given these limitations, Clearwire's voice service is less likely to be viewed as a reasonable substitute for many consumers. However, Clearwire is considered in this study, and its operations in Shasta County, one of the nine counties evaluated in detail, are explored further in Appendix A.

Geographic Analysis of Facilities-Based VoIP Alternatives

In order to evaluate the impact of the growth of facilities-based VoIP on California consumers, a study of the types of services offered by facilities-based providers, and the geographic availability of services was conducted. This aspect of the market for local voice services is important. Cable providers offer an independent facilities-based alternative to ILEC services. In theory, facilities-based supply, if it results in a large enough number of alternatives, should contribute to competition that is capable of protecting consumers. To evaluate the availability of facilities-based VoIP services, a study was conducted that examined the extent and nature of these services in nine California counties: Alameda, Fresno, Humboldt, Los Angeles, Madera, Sacramento, San Bernardino, Santa Clara, and Shasta. The combined population of these counties makes up approximately 48% of California's overall population. The counties were selected to provide representative profiles of the availability of cable and overbuilder voice services. These counties include high-density areas, as well as areas that capture the diversity of California's mountainous, insular, and agricultural areas. A detailed discussion of the methodology utilized to evaluate the availability of local telephone service provided by facilities-based VoIP providers is supplied in Appendix A.

Table 4, on the following page, summarizes the results of the research regarding cable voice service availability. The research found that in most urban areas, residential customers have one cable provider that serves their residence, and in many, but not all, cases this provider has some type of voice service

64 One medical alarm buyer's guide summarizes the issues with VoIP as follows: No medical alarm device should ever be hooked up to Voice over IP (Internet phones). No doubt, the telephone long distance rate is great. We use Voice over IP phones to connect our offices in Santa Barbara, Maui, Palm Springs and Los Angeles. We need a landline for backup because 10% of the time noise is so loud on the line, we must switch off VOIP. Switching to a landline is easy technology for our offices. In your home, when you need help the most, you could be in trouble. Beyond that noise problem… Internet connections are never reliable…

Solution:

If you are concerned about getting help consistently during an emergency… DON'T USE ANY OF THESE DEVICES in the telephone jack with your medical alarm system. The risk is simply too high. Keep it simple. If you must use one of these devices, a separate phone number (a separate phone line) for any medical alarm system or medical alert device is the best solution. *https://www.seniorsafety.com/*

65 According to Clearwire's web site, service is available in some areas in and around Chico, Merced, Modesto, Redding, Stockton, and Visalia. *http://www.clearwire.com/store/service_areas.php*

66 "Clearwire Digital Voice Service 911 is different than traditional 911. Availability may be delayed or disrupted by power failures, unavailability of broadband connections or delays in moving or establishing your phone number or address." https://www.clearwire.com/internet-phone-service/overview.php. See also: *https://www.clearwire.com/company/legal/911.htm*

67 Clearwire advises prospective customers "It is possible to be within the coverage area but not be able to receive a signal due to unusual geography or to be within the coverage area but not adequately receive signal due to unexpected circumstances." *http://www.clearwire.com/support/faqs.php*

offering. For most consumers, this results in one facilities-based alternative to the local telephone company. Table 4 shows that three of the counties (Los Angeles, Sacramento, and Shasta) have some overbuilder presence, and these overbuilders have more limited geographic availability within these counties than do the conventional cable companies. In these limited areas, consumers may have two alternative voice service providers, other than the local telephone company. Appendix A provides maps that show, on a Zip Code basis, the choices consumers can make in these counties. These results show that consumers in urban areas are much more likely than those residing outside of urban areas to have the ability to choose even one alternative voice service provider.

Table 5, below, reports the lowest-cost local service alternative that offers unlimited local calling found for the cable operators in the areas studied.[68] Table 5 shows that the impact of most cable operators packaging of voice services results in prices that are

Table 4:
Summary of Cable Voice Services by County

County	Total Facilities-Based VoIP Alternatives to ILEC Voice Service
Alameda	1 in most urban areas
Fresno	1 in most urban areas
Humboldt	1 in most urban areas
Los Angeles	1 in most urban areas, 2 in some urban areas
Madera	1 in most urban areas
Sacramento	1 in most urban areas, 2 in some urban areas
San Bernardino	1 in most urban areas
Santa Clara	1 in some urban areas
Shasta	1 in some urban areas, 2 in some urban areas

Table 5:
Summary of Cable Voice Service Prices

County	Cable Company or Overbuilder	Lowest Voice Service Prices
Alameda	Comcast	$37.95
Fresno	Comcast	$37.95
Humboldt	SuddenLink	$49.99
Los Angeles	Time Warner	$44.95
	Champion Broadband	$54.90*
	Charter	$44.99
	Cox	$12.55 to $15.25
Madera	Comcast	$37.95
Sacramento	Comcast	$37.95
	SureWest	$66.98*
San Bernardino	Time Warner	$44.95
	Charter	$44.99
Santa Clara	Comcast	$37.95
Shasta	Charter	$44.99
	Clearwire	$55.00*

***Includes required broadband purchase.**

68 Prices reported in Table 5 do not include taxes and fees.

well above the à la carte prices available from the ILECs. The voice service prices, with the exception of those available from Cox Communications, reflect voice service packages that add multiple features to local calling service, and typically also include unlimited long distance calling. This general lack of à la carte offerings reduces consumer choice, and also suggests that competitive forces are weak—vibrant competition supports à la carte options.

The cable operators and overbuilders identified in Table 5 also promote bundles of nontelephone services, such as video and broadband Internet access. Voice services, when purchased from a cable operator in a bundle, may have an implicitly reduced price. However, whether or not the consumer is interested in, for example, the video offerings of the cable provider, will determine whether these bundled service offers are reasonable alternatives. It is likely that consumers that have higher incomes, and who can afford to make substantial expenditures on bundles, will find better deals than those consumers that, either due to personal tastes, or to income limits, do not want to purchase a high-end bundle of services.

In summary, many urban areas will have one facilities-based alternative to ILEC service, and a much more limited number of urban customers may have two facilities-based alternatives to the ILEC. Consumers outside of high density areas are much less likely to have a facilities based alternative to the ILEC. The desirability of the alternative is also affected by the cable provider that operates in the area where a specific consumer resides. For example, Comcast, which serves metropolitan areas in the central valley and the Bay Area does not offer à la carte options for its voice services. Time Warner, which serves large areas in Southern California, does not promote à la carte, and also offers a service that is incompatible with technologies such as Tivo and satellite television. Charter Communications, which serves in Los Angeles and some other portions of the state, also does not promote à la carte telephone services. Cox Communications is the exception to the rule, but, as can be on Map CC, below, Cox Communications serves limited areas (Cox has the smallest service area of major cable operators in the state). This research indicates that with regard to facilities-based supply, market forces are not delivering much choice to consumers, and that prices and service offerings are not consistent with most consumers finding alternatives to à la carte options available from their telephone company.

Map CC

DUOPOLY IS NOT COMPETITION

The results summarized in Table 4, and discussed in more detail in Appendix A, suggest that the majority of Californians have two choices of facilities-based voice telephone service. In addition, consumers may find a few traditional CLECs still offering services. This market structure is not consistent with consumers finding sufficient protection from market power. Instead, the typical consumer is likely to be confronted with a duopoly market, i.e., a market with two facilities-based sellers, and a fringe of small-scale resellers that are entirely dependent on the ILECs for their inputs.[69] Outside of those consumers that reside in Cox Communications' service area, the alternative available from the cable company will not permit the purchase of voice services outside of an all-inclusive package.

It is widely recognized by economists that duopoly markets are much less likely to generate outcomes consistent with those expected under competitive conditions, i.e., duopoly firms recognize a mutual interdependence of actions, resulting in restricted output and higher prices, as compared to competitive markets.[70] Duopoly telecommunications markets have not performed well. For example, at one time the FCC issued two cellular licenses in each market area. One license was offered to the incumbent telephone company, with the second made available to any other qualified applicant.[71] The historical performance of this previous cellular duopoly market has been examined by academic researchers, who have found that the theoretical economic predictions have been borne out by data from cellular duopoly markets:

> The evidence suggests that cellular prices are significantly above competitive levels. . . .it appears from our study that certain firms nevertheless obtain higher-than-normal rents, given such an industry structure. . . .[I]n markets where independent operators face each other exclusively. . .we find outright cartel pricing.[72]

Likewise, the U.S. Department of Justice's investigation of cellular market led it to conclude:

> The Department's extensive investigations into the cellular industry . . . indicate that cellular duopolists have substantial market power . . . . The basic structural problem with cellular markets is well known -- the fact that they are and have been duopolies with (at least until very recently) absolute barriers to entry. While the FCC's decision to issue two cellular licenses -- rather than only one -- was motivated by a desire to stimulate competition, . . . two firm markets are not particularly competitive. The noncompetitiveness of two-firm markets is exacerbated here by the overlapping alliances of the cellular carriers, so that firms that "compete" with each other in one market are partners in another.[73]

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69 Because the fringe firms, the traditional CLECs, serve few customers, and are entirely dependent on terms and conditions set by the ILECs for their service offerings, the competitive impact of these firms is minimal.

70 See, for example, Carlton, Dennis, and Jeffery Perloff, *Modern Industrial Organization, 4th Ed.* Pearson Addison Wesley, 2005, pp. 161-170.

71 See, for example, Berresford, John. "The Impact of Law and Regulation on Technology: The Case History of Cellular Radio," *The Business Lawyer*, Vol 44, May 1989, p. 727.

72 Parker, Philip and Lars-Hendrik Roller. "Collusive Conduct in Duopolies: Multimarket Contact and Cross-Ownership in the Mobile Telephone Industry," *The RAND Journal of Economics*, Vol. 28, No. 2, Summer, 1997, p. 321.

73 Memorandum of the United States in Response to the Bell Companies' Motions for Generic Wireless Waivers at 14-15, United States v. Western Electric Co., Civ. Action No. 82-0192 (HHG), D.D.C., filed July 25, 1994 (quotation marks, citations, and punctuation omitted), cited *In the Matter of Implementation of Section 6002(B) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services*, First Report. Federal Communications Commission, 10 FCC Rcd 8844; 1995 FCC 95-317, released August 18, 1995.

The lackluster performance of the cellular duopoly is important when considering whether a duopoly in the provision of local telephone service will protect consumers from market power. There is every reason to expect that telephone and cable companies will not engage in price competition.

Facilities-Based Entry is a Key to Price Competition

During the period of the cellular duopoly, "market forces" did not protect consumers. However, in 1993 Congress authorized the FCC to issue licenses for new wireless telephony services, which resulted in entry of new firms in the wireless market.[74] The initial auctions for the "Personal Communications Services" (PCS) licenses were held in 1995 and 1996, with service deployment beginning shortly thereafter.

From an economic perspective, market entry is a critical element in controlling market power. The market entry enabled by the FCC's new licenses for PCS services increased the number of wireless service providers, and by the early 2000's, there were six (6) facilities-based nationwide wireless carriers,[75] and other facilities-based regional wireless carriers.[76] Thus, consumers would no longer face the choice between two providers, rather, multiple facilities-based firms would vie for consumers' wireless business. While the number of firms in wireless markets was still not large, the new market entry was highly disruptive to collusive pricing practices that were previously associated with cellular duopoly markets.

Important to the process of pricing discipline is the fact that new market entrants, to be successful, must establish themselves in the market. This can be accomplished by offering a service at a lower price than the service which is offered by the incumbent firms, or other rivals. Collusive pricing behavior is much less likely when entry is occurring in a marketplace because new firms must establish themselves and capture market share.

The data in Table 6, on the following page, shows a period of vigorous price competition in the wireless market during the period 1998 to 2001, when the new wireless carriers were establishing themselves in the wireless market. Price declines have leveled off in the wireless industry, and in recent years mergers have decreased the number of nationwide carriers from six (6) to four (4),[77] and midsize carriers such as Alltel Wireless, CellularOne, and Western Wireless have been absorbed into the two largest wireless providers, AT&T and Verizon. This industry consolidation may explain the leveling off of price decreases, and also may explain the recent class action suits brought against major wireless carriers regarding text messaging price increases.[78] However, the moral of the story is that consumers that face multiple facilities-based providers vying for their business are more likely to experience price benefits in the market.[79]

74 See, for example, In the Matter of FCC Report to Congress on Spectrum Auctions, WT Docket No. 97-150, FCC 97-353, Released October 19, 1997, p. 9.

75 The six nationwide carriers were: AT&T Wireless, Cingular Wireless, Nextel, Sprint, VoiceStream, and Verizon Wireless.

76 Up to eight (8) facilities-based licenses existed in major market areas. Wireless resellers also emerged.

77 AT&T Wireless was acquired by Cingular Wireless, and Cingular was eventually renamed AT&T Wireless. Sprint and Nextel also merged. VoiceStream was acquired by Deutsche Telecom and renamed T-Mobile.

78 See, for example, "Class action nets group of top wireless carriers for texting, other charges," RCR Wireless, May 16 2008.

79 The discussion of the impact of entry in the wireless industry focuses on pricing issues alone, and ignores non-price factors from which consumers frequently did not find adequate protection. For example, market forces did not overcome unfavorable wireless market outcomes such as poor service quality, confusing billing, handset bundling, and long-term contracts.

Table 6:
CPI for Wireless Service as Reported by the Bureau of Labor Statistics

Year	CPI Wireless Service Price Index	Annual Price Change for Wireless Services
1997	100.00	
1998	95.10	-4.90%
1999	84.90	-10.73%
2000	76.00	-10.48%
2001	68.10	-10.39%
2002	67.40	-1.03%
2003	66.80	-0.89%
2004	66.20	-0.90%
2005	65.00	-1.81%
2006	64.60	-0.62%
2007	64.38	-0.34%
2008	64.24	-0.22%

When considering the market for local telephone services, it is clear that the level of facilities-based entry does not rise to the level experienced by the wireless industry following the FCC's decision to eliminate the cellular duopoly. Entry by one facilities-based cable voice rival, or even a second overbuilder serving limited areas, is simply not enough to protect consumers.

However, it is reasonable to conclude that widespread entry of five or six additional facilities based suppliers in the local market would make price competition much more likely.[80]

ILEC PRICING ACTIONS SUGGEST MARKET POWER

When evaluating the status of competition, the CPUC heard from telephone company experts regarding the prospects for ILEC pricing behavior, should the CPUC lift pricing constraints. For example, Dr. Robert Harris, an economic expert testifying on behalf of SBC (now AT&T California), told the CPUC:

> One of the reasons I'm confident in making the recommendations that I'm making to this Commission (i.e., to remove price caps) is that I'm firmly convinced that the stupidist thing SBC or Verizon could do was think, oh, we got some pricing flexibility now. Let's start jacking up local service rates.[81]

This prediction has simply not been borne out. As the ILECs have gained pricing flexibility, they have "jacked up" local service rates. Reviewing the history of these rate increases clearly shows that the "economic theory" that influenced the CPUC's decision to lift pricing constraints did not correctly predict how ILECs would utilize their new-found freedom.

80 If one's observation on this hypothetical entry scenario is "there is no way that such a high number of facilities-based providers could be supported by the market due to the high fixed costs of building a network," then this suggests entry barriers and a "natural duopoly." And because of the observed lack of price competition, discussed further below, it also suggests the continuing need for price regulation.

81 From Dr. Harris' oral testimony. See, CPUC01-#220620-v1-R0505005_013006_Vol_2, at 364.

Following the CPUC's decision to remove price caps on local telephone services, rates for services other than basic local telephone service had pricing restrictions removed. In 2008, the CPUC also initiated a phased transition to full pricing flexibility for basic service rates by allowing the ILECs to increase basic rates by up to 60% over a two-year period. The CPUC has also allowed the ILECs to increase LifeLine rates by as much as 63% over a two-year period. The response of telephone companies to this newfound freedom supports the proposition that market forces are not providing a constraint on market power—the competition that was supposed to protect consumers has failed to deliver protection to consumers.

Table 7, on the following page, summarizes selected AT&T price increases implemented since 2006.[82] It is clear from Table 7 that AT&T believes that it can profitably increase prices for its services, even when the rate increases are substantial. This is an indication that AT&T does not believe that it faces the prospect of a vigorous pricing response from some rival. This pricing behavior supports the proposition that rates for basic service should be capped.[83]

It is also important to note that by increasing basic local service rates, and the rates for stand alone features, AT&T can discourage the purchase of à la carte services, and promote its packages and service bundles. This pricing strategy, while perhaps leaving à la carte options "on the menu" contributes to the de facto elimination of à la carte options. It is also notable that AT&T has implemented significant increases for its local toll services. Rising prices for long distance services raises another red flag regarding the state of competition in markets for telephone services. Finally, while the focus of this report is on the residential market, it is notable that substantial increases have been implemented by AT&T for its business services. Since the URF decision the price of a basic business access line has been increased 89%; the price of a basic PBX trunk has been increased by 84%; the price of a business local toll minute has increased 94%; the price of business inside wire maintenance has increased 58%; and the price of business 3-way calling has increased 48%. These increases indicate that the lack of competition in residential markets is also apparent in the small business market.

Verizon, California's second largest ILEC has also implemented substantial residential rate increases. Table 8, below follwing Table 7, summarizes some of these increases. The price increases in Table 8 are also indicative of the lack of price discipline provided by market forces. The fact that Verizon has pursued price increases for bundles and packages also indicates that Verizon does not believe that price competition from its cable rivals is likely.

The rate increases summarized in Tables 7 and 8 do not comport with a market subject to price competition, and are consistent with the presence of market power. As the CPUC is now moving to eliminate all pricing constraints on basic service, and to also allow geographically targeted price increases, it is reasonable to expect that additional price increases will be forthcoming, and that market forces will not constrain the market power possessed by the ILECs. Additional basic service price increases will also likely reduce the availability of à la carte options as a viable alternative to package and bundled offerings available from the ILECs or their cable rivals.

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82 The term "URF" that appears in Table 7 abbreviates "Uniform Regulatory Framework," i.e., the CPUC's 2006 decision to remove price caps. Price increase information in Tables 7 and 8 is from the CPUC web site: *http://www.cpuc.ca.gov/PUC/Telco/Consumer+Information/070905_phsvcchanges.htm*

83 The CPUC has indicated that it will continue to cap basic rates in "high cost" areas of the state. However, the cap specified, $36 per month for basic service, would do little to prevent additional, dramatic, rate increases.

84 *http://www.cpuc.ca.gov/NR/rdonlyres/80EAB232-5356-468A-8FB1-4F12D4CE55B1/0/CDAdvisory_toCAB_Nov_2008__2_.pdf*

Table 7:
AT&T Residential Rate Increases Since URF

	Percent Increase Since URF	Increased Rate	Rate When URF was Implemented	Date of Most Recent Increase
Basic Flat	26%	$13.50	$10.69	1/1/2009
Basic Measured	28%	$ 7.28	$5.70	1/1/2009
Basic LifeLine	14%	$ 6.11	$5.34	1/1/2009
Price of 3-Minute Call				
		New	Old	
Local Toll				
13-20 Miles, Day	111%	$0.36	$0.17	4/1/2008
13-20 Miles, Evening	97%	$0.27	$0.14	4/1/2008
13-20 Miles, Night	163%	$0.27	$0.10	4/1/2008
>21 Miles, Day	71%	$0.42	$0.25	4/1/2008
>21 Miles, Evening	68%	$0.33	$0.20	4/1/2008
>21 Miles, Night	124%	$0.33	$0.15	4/1/2008
Calling Features				
Caller ID	62%	$9.99	$6.17	1/15/2008
Anonymous Call Rejection	242%	$6.50	$1.90	1/1/2009
Call Forwarding	86%	$6.00	$3.23	1/15/2008
Call Waiting	86%	$6.00	$3.23	1/15/2008
Three-Way Calling	86%	$6.00	$3.23	1/15/2008
Call Screen	86%	$6.00	$3.23	1/15/2008
Repeat or Speed Dialing	86%	$6.00	$3.23	1/15/2008
Call Trace	29%	$6.00	$4.65	1/1/2009
Directory Services				
Non-Published Listing	346%	$1.25	$0.28	6/1/2007
DA Service	226%	$1.50	$0.46	9/15/2007
Miscellaneous Services				
WirePro	101%	$6.00	$2.99	1/15/2008
Returned Check	276%	$25.00	$6.65	3/23/2007
Non Published Listing - White page & DA	346%	$1.25	$0.28	6/1/2007
Non Published - white page only	614%	$1.00	$0.14	6/1/2007
uSelect Package	36%	$15.31	$11.26	1/15/2008
Advantage Plan/The Works	14%	$25.37	$22.32	1/15/2008

Table 8:
Verizon Local Phone Rate Increases Since URF

Services	Rate Prior to URF	Most Recent Revised Rate	% Change	Date of Most Recent Increase
Flat Rate Basic Local Service	$17.25 or $17.66	$19.50 or $19.91	12.5% or 13%	1/1/2009
Basic LifeLine	$5.34	$6.11	14%	1/1/2009
Local Toll (Day Rate)†				
Initial/Additional Minute	$0.114/$0.070	$0.16/$0.16	40%/129%	4/1/2008
Three-Minute Local Toll Call	$0.254	$0.48	188%	
Directory Assistance				
Free Allowance	5	0		4/1/2008
Per Call Charge	$0.35	$0.95	171%	4/1/2008
Price of 6 Directory Assistance Calls	$0.35	$5.70	1,528%	4/1/2008
Inside Wire Maintenance Plan	$2.99	$4.95	66%*	8/1/2007
Call Waiting	$3.50	$4.50	29%	8/1/2008
Bundles/Packages				
Verizon Local Packages	$30.95 to $39.95	$34.95 to $43.95	13% to 7%	4/10/2008
Verizon Regional Package	$40.00	$44.00	10%	4/10/2008
Verizon Freedom Unlimited	$56.99	$60.99	7%	4/10/2008

†Uses rates for 13-20 mile day rate call
*For customers that purchase bundled services the increase in the Inside Wire plan was to $3.99, or 33%.

Price Matching is Not Price Competition

As has been documented in this report, the market for local telephone services in California is characterized by a small number of facilities-based local service providers—the ILEC and a cable company. In limited areas there may be an overbuilder. Thus, consumers, at best, have two or three facilities-based choices. Markets with small numbers of facilities-based service providers may be prone to price matching and tacit collusion rather than price competition.[85] For example, cable service operators, rather than pricing based on their own costs, priced their voice service packages that contain unlimited local and long distance calling to correspond with ILEC voice package prices for packages that contain unlimited local and long distance calling.[86]

85 While it is true that there are also some resale providers remaining in the market, because these firms are entirely dependent on the ILEC for their inputs, they have little ability to engage in price competition with the ILEC.

86 Table 5 reports cable voice prices. Verizon voice service packages that contain unlimited local and long-distance calling are priced starting at $49.99 per month; AT&T voice service packages that contain unlimited local and long-distance calling are priced starting at $45 per month (currently available with an online promotion at $40 per month).

Likewise, Cox Communications, which is the only cable operator that offers basic telephone service as a stand-alone option, rather than establishing a price for basic service based on its costs, offers basic service prices to reflect prices offered by either AT&T or Verizon, depending on the customer's location.[87] In addition, following AT&T and Verizon price increases for basic service rates and à la carte calling features like call waiting and three-way calling, Cox increased the price of its basic service rates by 25%,[88] and increased à la carte features by 25% per month for the first feature, and by 100% per month for additional features. Cox also increased Caller ID prices by 25% after AT&T increased its Caller ID rates.[89] This evidence of price leadership, where Cox follows the ILEC's lead on price increases, does not support the proposition that "competition" protects consumers, but rather paints a picture of a market, where the dominant ILECs set prices, and other firms "follow the lead."

SUMMING UP—ASSESSING "CHOICE" FOR LOCAL TELEPHONE SERVICES

This section of the report combines evidence on the variety of factors discussed above (and further discussed in the report's Appendices) that can impact consumer choice of local voice services. Ranking of the degree of "competition" observed in the geographic areas studied, from all sources, will be presented, and the observed outcomes will be "graded" to indicate the success or failure of "competition" protecting the large number of California consumers that continue to purchase local telephone services from their local telephone company.

This report has evaluated market conditions in nine California counties. What is immediately notable regarding the status of customer choice and competition in these counties is the relative lack of alternatives to the local services sold by the ILECs, and the low level of facilities-based entry. As discussed above, the level of facilities-based competition uncovered in this research is not likely to motivate price competition sufficient to protect consumers. Facilities-based entry has not come close to the level of facilities-based entry that characterized wireless markets in the early part of this century, which resulted in some degree of price competition for consumers.

The study shows that the primary factors associated with differences that consumers will experience in the marketplace are directly associated with a consumer's place of residence. For example, the cable television provider serving a consumer's home will have a substantial impact on the types of services that are available. Alternatively, consumers that reside in AT&T's service area may have a few more traditional CLEC options than is the case for consumers that reside in Verizon's service area.

In order to rank the variation in market conditions, a study was done that began with the identification of the portion of a county's population that has choice. Table 9, on the following page, summarizes the results of this study. The ranking shown in Table 9 places Sacramento at the top of the counties with regard to consumers' ability to choose among facilities-based local service providers.

To arrive at the ranking shown in Table 9, population data for the Zip Code Areas studied was used to calculate the maximum percentage of the population in the county that had either one or two choices of facilities-based alternative supply. It is important to note that since the research

87 See, Cox Tariff, Eighteenth Revised Cal. PUC Sheet 13T. Available at: *http://www.cox.com/Telephone/StateTariffs/California/CALocal/CALocal_A-1_ %203-11-09AL525.pdf*

88 *http://www.cpuc.ca.gov/NR/rdonlyres/A482089A-1E4B-43F9-8106-4752A344B244/0/CDAdvisory_toCAB_March2009.pdf*

89 Cox price increase information reported here from the CPUC web site. *http://www.cpuc.ca.gov/PUC/Telco/Consumer+Information/070905_phsvcchanges.htm*

methodology did not check service availability at each address in a county, the values shown in Table 9 are highly conservative, and represent a theoretical maximum level of service availability. This summary assumes that if any service was found in a Zip Code area, that all households can get service. This may be a reasonable assumption for high-density urban areas, but in suburban and rural areas, this approach likely overstates the availability of services.[90]

From the results shown in Table 9, it is clear that in Sacramento County, because of the SureWest Broadband overbuild into the service areas of AT&T and Citizens/Frontier, consumers have an additional choice that is more widely available than in any of the other eight counties. San Bernardino, Los Angeles and Alameda show overall outcomes that are similar to one another, and the very limited overbuilder activity in San Bernardino and Los Angeles does not offer a "third choice" to many consumers. Santa Clara's result is somewhat more like the rural counties, and this is due to the lack of voice services in Charter Communications' service area around the urban areas of Morgan Hill and Gilroy.[91] Predictably, the larger population center in Fresno County raises this generally more rural county's score slightly above the three most rural counties in the study. Shasta County, because of the presence of Clearwire, has a relatively high percentage of its population with a second facilities-based source of VoIP. However, because of the limitations of this wireless VoIP product, which is much more similar to over-the-top VoIP, it is not reasonable to place the availability of this technology on the same level as, for example, SureWest's fiber-based overbuild in Sacramento County.

The results in Table 9 are shaded to suggest the "breaks" in the distribution of choice among facilities-based alternatives, and where there are no clear breaks, the counties "tie" for the ranking. This ranking reflects both the proportion of the county's population that has at least two choices—typically the local telephone company and the local cable company—and the limited presence of three choices in some counties. *While variations in choice have been categorized, there is still no evidence that the level of choice in any county rises to that sufficient to discipline ILEC market power*. As discussed above, market evidence points to unjustified price increases and price leadership among the small number of local service providers.

Table 9:
Ranking Consumer Choice of Facilities-Based Local Services in the Nine Counties

County	Maximum Percent of Population with Two Choices of Facilities- Based Local Service Providers	Maximum Percentage of Population with Three Choices of Facilities- Based Local Service Providers	Rank
Sacramento	98.6%	43.2%	1
San Bernardino	95.1%	6.9%	2
Los Angeles	99.2%	1.1%	2
Alameda	99.5%	0.0%	3
Santa Clara	88.5%	0.0%	4
Fresno	84.0%	0.0%	5
Humboldt	82.9%	0.0%	5
Shasta	77.4%	77.4%*	6
Madera	80.1%	0.0%	6

*Reflects Clearwire wireless VoIP services.

90 The rankings shown in Table 9 also provide a reasonable gauge of broadband availability in the counties. This suggests that ranking of the availability of over-the-top VoIP services is also reflected in Table 9.

91 See Appendix A for full discussion of the county studies.

Further Consideration of the Potential for Cord Cutting

As was discussed above in the report, and further in Appendix B, wireless cord cutting is a niche market phenomenon, and does not provide adequate pricing discipline for local telephone services. However, to be complete, wireless service availability, as represented by wireless carrier coverage maps, was assessed to evaluate the relative quality of wireless coverage in the nine counties. Presumably, better wireless coverage will make it easier for a consumer that finds wireless to be a reasonable alternative to "cut the cord" and go wireless-only. Wireless carrier coverage maps, and their descriptions of service capabilities were evaluated in each of the counties, and judgement was applied to determine the relative service quality across the counties.[92]

This review resulted in a relative ranking (on a scale of one [1] to five [5]) of wireless coverage across the nine counties. Table 10, below, shows that the general assessment of wireless coverage results in a similar ranking compared to the results shown in Table 9. The more rural counties generally have wireless carriers showing lower levels of service quality. San Bernardino and Los Angeles counties, especially the urban areas, have representations of better quality service than the other urban counties. Adding this consideration to the county-level assessment does not lead me to conclude that the relative ranking of "choice" that is shown in Table 9 should be altered.

Factoring in Traditional CLECs

Finally, the impact of resale/UNE competition was also weighed for the nine counties, with the main consideration as to whether there was a substantial presence of carriers other than AT&T California in a county.[93] Table 11, on the following page, summarizes the county-wide assessment of the CLEC impact on consumer choice. As discussed in an earlier section of this report, the CLEC sector has declined, and many CLECs have characteristics that make their services less likely to be provide a viable choice for consumers. However, to factor in the impact of traditional CLECs on the overall ranking, in counties that are served by AT&T California alone, or where AT&T serves the most areas, the CLEC impact is considered a "plus."

Table 10:
Ranking of Wireless Coverage

County	Wireless Coverage Assessment *(1 = Lowest, 5 = Highest)*
San Bernardino	4
Los Angeles	4
Alameda	3.5
Sacramento	3.5
Santa Clara	3.5
Fresno	3.0
Humboldt	2.5
Madera	2.5
Shasta	2

92 Service coverage maps were evaluated for AT&T Wireless, Sprint/Nextel, TMobile, and Verizon Wireless. Of these four carriers, Verizon Wireless shows only a general depiction of its coverage area, but does not represent signal strength. Thus, the coverage variability across the counties associated with AT&T Wireless, Sprint/Nextel, and T-Mobile maps was used to identify service quality variability.

A substantial presence of Verizon (or other ILECs which generally have limited CLEC accommodation) in urban areas, as is the case in Los Angeles and San Bernardino results in a "minus" assessment. While there is some variation across the counties with this assessment, the "marking down" of Los Angeles, Sacramento, and San Bernardino, or the "marking up" of Alameda, Humboldt, and Madera, does not rise to the level of changing the ranking shown earlier in Table 9. As discussed earlier, the ability of the traditional CLEC sector to discipline prices is limited.

Table 11:
ILEC Presence by County and CLEC Potential

County	ILECs Serving Urban Areas in County	Other ILECs in County	Impact on Traditional CLEC Availability
Alameda	AT&T	None	Plus
Fresno	AT&T; Verizon	Verizon; Kerman; Ponderosa	Neutral
Humboldt	AT&T	Verizon; Siskiyou; Citizens Frontier	Plus
Los Angeles	AT&T; Verizon		Minus
Madera	AT&T	Verizon; Ponderosa; Sierra	Plus
Sacramento	AT&T; Citizens/Frontier; SureWest		Neutral/Minus
San Bernardino	Verizon; AT&T	Ponderosa; Citizens/Frontier	Minus
Santa Clara	AT&T; Verizon	Verizon; Citizens/Frontier	Neutral
Shasta	AT&T; Citizens/Frontier	TDS Telecom	Neutral

Grading the Results

Given the evaluation above, which considers the scope of facilities-based wireline entry (and broadband availability), the quality of wireless services, and the ability of consumers to access to the declining CLEC sector, (as well as the information discussed earlier in this report, and in the report's Appendices), the general grouping shown in Table 9 continues to provide a reasonable ranking of the general level of choice across the nine counties. However, even in Sacramento, which displays the highest level of facilities-based entry, the degree of choice is not consistent with the removal of price caps for local telephone services, as envisioned by the CPUC. If competition for local telephone services were to be graded in these nine counties, Sacramento deserves a "D." The one additional choice that many consumers enjoy is an incremental step in the right direction. However, the balance of the counties would be awarded "D-" and "F" grades, see Table 12 on following page. Market forces are failing to offer adequate protection for California consumers, and removal of price caps for local service rates is not a reasonable action given this failure.

It is likely that additional facilities-based entry might bring these grades up. However, whether new multiple sources of facilities-based supply are possible is highly questionable. Thus, given the lack of consumer protection associated with the current level of "competition," it is reasonable to establish pricing protection for consumers through regulatory means.

93 As discussed earlier, AT&T has the highest level of traditional CLEC activity. Verizon's service area has a more limited CLEC presence, and SureWest and Citizens/Frontier (as well as other smaller ILECs) have even less CLEC activity.

Table 12:
Local Service Competition "Report Card"

County	Letter Grade for Competition's Ability to Protect Consumers
Sacramento	D
San Bernardino	D-
Los Angeles	D-
Alameda	D-
Santa Clara	F
Fresno	F
Humboldt	F
Shasta	F
Madera	F

CONCLUSION

California consumers continue to face a market for local telephone services that offers few choices in general, and virtually no choice for consumers that prefer to purchase services outside of a package or bundle. The traditional CLEC sector cannot be viewed as providing a check on ILEC market power. The fact that traditional CLECs are entirely dependent on inputs provided by ILECs suggests that the lack of independence will not result in price competition that is capable of protecting consumers. While there has been growth of facilities-based supply through the cable sector, most consumers face an environment where they have only one, or in limited cases, two alternative choices, while others may have no choice at all. This market structure does not offer a foundation that will encourage price competition and offer protection to consumers. The fact that cable alternatives typically promote bundles of services further undermines choice, and makes it less likely that price competition will emerge between telephone companies and their cable rivals. It is likely, as borne out by ILEC pricing actions since the CPUC's 2006 decision, that additional price increases for basic local service will not be constrained, and the resulting duopoly will lead to additional harm to consumers.

Given the state of the market for local telecommunication services, the CPUC's decision to remove price caps on all local telephone services is inappropriate and fails to offer consumers sufficient protection in the marketplace. The pricing patterns revealed to date under the removal of regulatory oversight implemented by the Commission is not consistent with rates that are "just and reasonable," as is still required by statute. A substantially improved market outcome could be achieved if ILEC basic local service rates remained under a reasonable price cap. Capping prices on popular vertical features would also promote à la carte options, and encourage more choice. Absent a price cap, market suppliers face no constraint on upward pricing, as standalone basic service can be priced to make à la carte options unattractive, and to drive consumers to purchase expensive packages and bundles. Keeping basic service rates under a price cap will promote consumer choice, and provide some degree of discipline to a market that continues to exhibit market power. As the CPUC's decision also permits, beginning in 2011, geographic deaveraging of basic telephone service, i.e., local telephone companies will have the ability to target specific communities with rate increases, it is imperative that this provision of the CPUC's decision also be reversed. The continuing market power identified in this report, combined with local telephone companies' ability to geographically target rate increases, can only increase the harms already experienced by California consumers.

POLICY RECOMMENDATIONS

It is clear from the observed behavior of telephone companies and their cable rivals that market forces are not sufficient to protect consumers. Market outcomes in the service areas of the state's four largest ILECs provide substantial evidence that consumers are facing firms that possess market power.

- As the last threads of price protection for basic service rates will be removed in early 2011, it is imperative that the CPUC take action to reinstate reasonable price caps for local service rates. The price caps should, at a minimum, constrain basic rate increases to no more than the rate of inflation.[94]
- As the CPUC's has also decided to permit, beginning in 2011, geographic deaveraging, i.e., local telephone companies will have the ability to target specific communities with basic service rate increases, it is imperative that this provision of the CPUC's decision also be reversed. The continuing market power identified in this report, combined with local telephone companies' ability to geographically target rate increases, can only increase the harms already experienced by California consumers.
- In addition to a price cap on basic rates, LifeLine rate increases should be reversed, and a uniform, affordable, LifeLine rate should be established statewide. The continued affordability of basic telephone service to low-income households is a pressing issue given the economic crisis that is gripping California.
- Finally, the CPUC should more closely monitor market outcomes associated with pricing, service quality, and the delivery of advanced services

EPILOGUE

As this report was going to print, TURN gained access to a previously unreleased study conducted by the Staff of the California Public Utilities Commission. This study, titled *Market Share Analysis of Residential Voice Communications in California*, utilizes proprietary information associated with the FCC's Form 477 to calculate market shares of firms serving the residential market for the period ending in December of 2007. The report also develops summary statistics assessing changes in market share over time.

Market share is highly valuable when assessing the status of competition.[95] The Staff study found that the residential voice communications markets in California are highly concentrated. Furthermore, between June of 2005 and June of 2007 market concentration increased in residential markets for wireline voice services, wireless voice services, and broadband services, measured either separately or on a combined basis. The CPUC's finding is startling, as it shows that even if one assumes that a wireline telephone, a wireless telephone, or a broadband connection are perfect substitutes for one another, market concentration has increased. These results support the conclusions of TURN's report that competition is insufficient to protect consumers.

94 Price cap plans have typically relied on inflation as measured by the Gross Domestic Product Price Index (GDPPI).

95 A common tool utilized to evaluate market share is the Herfindahl-Hirschman Index (HHI) used by the U.S. Department of Justice (DOJ) to evaluate mergers. As a rule of thumb the DOJ considers HHI values of more than 1,800 top reflect highly concentrated markets. The Staff study shows that all HHI values in the markets, either individually or on a combined basis, are above 1,800, which indicates that these markets are highly concentrated.

Appendix A:
Geographic Evaluation of Facilities-Based Local Service Alternatives

Methodology

Telephone companies like AT&T California, Verizon, SureWest, and Frontier, operate in service areas that originally resulted from franchises granted by the state. The overwhelming majority of California households reside in an area where a telephone company has service.[1] The methodology described in this appendix seeks to identify the number of facilities-based alternatives to a household's local telephone service provider. Thus, the term "alternative provider" should be understood as an alternative to the telephone company that provides local telephone service. To evaluate consumer choice in each area, research was undertaken to identify the facilities-based providers of local telephone service offered by cable television companies or other facilities based overbuilders.

The geographic basis used to conduct the research focused on Zip Codes located within nine California counties. U.S. Postal Service Zip Codes are not geographic areas. Rather, they reflect mail routes that exist in a geographic area. The U.S. Census Bureau associates Postal Service Zip Codes with geographic boundaries created by the Census Bureau. These Zip Code Tabulation Areas (ZCTAs) provide unique sub-county geographic zones. Geographic reference to Zip Codes in this report reflect ZCTAs, that have been matched to Postal Service Zip Codes.[2] Mapping tools were used to overlay Census Bureau five-digit ZCTAs on maps of county boundaries. In addition, a list of Zip Codes was obtained for the counties, and care was taken to identify all geographic Zip Codes in the County.[3]

With regard to telephone company service areas, maps were obtained from the California Public Utilities Commission.

Several sources of publicly available data were utilized to determine alternative provider service availability and service prices. General Internet searches were conducted to identify telephone service providers in counties. In addtion, the service availability tools provided at specific cable company, cable overbuilder, and other service provider web sites were used. These web-based tools require that information be inputted regarding the location where service is desired. In some cases, the cable company web site requires a specific street address and Zip Code. In other cases, Zip Code information regarding the service location was all that was requested.

1 Certain insular areas may not be served by a telephone company, but the overall number of households in these areas is likely very small.

2 Given that the most recent ZCTAs released by the Census Bureau reflect 2000 Census information, the research identified some Zip Codes that have been introduced since 2000, using data from USNaviguide.com, that is discussed further below.

3 Some Zip Codes are associated with "point" locations, such as a Post Office box, or a specific business. These point Zip Codes were not studied.

Additional information was obtained from cable-industry service locator tools, such as Go2Broadband.com. Go2Broadband.com is a service of CableLabs, the research affiliate of the cable industry.[4] The Go2Broadband.com tool provides service information based on the street address of potential customer locations. Cable Movers Hotline, a web site that provides information on cable service availability and cable service offers based on the street address of potential customers, was also used.[5] These services were used to confirm the identity of service providers at specific addresses. For example, Time Warner Cable identifies service availability based on Zip Codes alone. Thus, the databases available from Go2Broadband and Cable Movers Hotline were used to check service availability at the street address level.[6] Finally, information from MediaPrints™, a division of Warren Communications News was reviewed. MediaPrints™ publishes maps of cable service operators' service territories, and includes a summary of services available. According to MediaPrints™ representatives, the information published in the company's mapping products is based on self-reported information from the cable, and cable overbuilder industry.[7]

To obtain street addresses within a Zip Code, the mapping tool available from USNaviguide.com was used. This mapping tool overlays Zip Code areas with street/road-level mapping. It also provides satellite pictures that can be overlaid on the Zip Code/street maps, which proved useful in the identification of residential areas within rural and remote insular areas, as well as separating industrial/commercial areas from residential areas in urban/suburban Zip Codes.

To illustrate that general approach taken with this research, I will provide an example of analysis conducted in Fresno County. The Fresno County Zip Code 93706 includes high-density suburban areas that abut downtown Fresno. However, 93706 also includes large agricultural areas, where residential housing is widely scattered. 93706 also includes a small town, Eaton. Various sources indicate that Fresno County is served by Comcast. Use of USNaviguide.com's mapping tool to obtain specific addresses was combined with Comcast's service locator tool and Go2Broadband, to investigate service availability in each of these general areas of 93706 (high density, low density, and Eaton). The results indicate that Comcast appears to offer voice telephone service widely in this Zip Code. Go2Broadband also identified only Comcast service (Go2Broadband will identify multiple cable providers in areas where an overbuilder offers service).[8] Use of other Internet search tools also did not reveal any additional alternative voice service suppliers in this area.

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4 "Founded in 1988 by cable operating companies, Cable Television Laboratories, Inc. (CableLabs®) is a non-profit research and development consortium that is dedicated to pursuing new cable telecommunications technologies and to helping its cable operator members integrate those technical advancements into their business objectives." *http://www.cablelabs.com/about/*

5 Cable Movers Hotline® indicates that it is a service of the cable industry and lists multiple cable companies as sponsoring the web site.

6 Time Warner customer service representatives also utilize Go2Broadband.com to identify service availability.

7 The research conducted for this report examined service availability in detail, and during the course of this evaluation it became clear that while some information available from MediaPrintsTM is accurate, substantial amounts of information reported by MediaPrints™ is incorrect.

8 In the case of the 93706 Zip Code used in this example, the information contained in the MediaPrints™ database is supported by the additional research in the Zip Code. In other instances, this is not the case. For example, MediaPrints™ reports that SuddenLink offers service in another portion of Fresno County. This report was not supported by the research. No service provider could be found in area identified by MediaPrintsTM as being served by SuddenLink. Both Go2Broadband and Cable Movers Hotline did not identify any service provider in this portion of Fresno County, and SuddenLink's web site and service representatives indicate that they do not serve this area.

INTERPRETING THE MAPS

Each county has at least one map provided that depicts the urban areas identified by the U.S. Census Bureau, and also identifies selected cities to provide points of reference. Within the county boundaries, Zip Code areas are outlined. Color coding is utilized in the map to associate the choices available with the service providers operating in specific Zip Code areas. In most cases, the choice is between one local telephone company and one cable company. In isolated cases, some consumers were found to have one additional choice. In some counties, a single choice between a telephone company and cable company was found to be available nearly county-wide. In other cases, multiple telephone and cable companies serve the county, resulting in consumers in various locations in the county having different choices, but still generally having only the ability to choose between one telephone company and one cable company.

Because of variation in the availability of service found in some Zip Code areas, some of the descriptions of choices indicate that the choice reported might not be widespread in the Zip Code area. For example, in Sacramento County, SureWest Broadband provides service as an overbuilder. In a few Zip Code areas, SureWest was found to have service widely available. In other Zip Code areas, service availability was found to be more sporadic. Thus, the description of the choices in these Zip Codes reflects these types of differences.

Areas color-coded in white on the maps are associated with geographic locations where consumers continue face only one-choice, i.e., their local telephone company. While this condition is more commonly associated with rural areas, some urban areas still have this monopoly outcome. It is also important to note that the results tend to overstate the areas where consumers have choice. Because many Zip Code areas are large, and extend outside of urban areas, the maps generally over-represent the existence of choice. It is much less likely that choice is available in areas outside of the urban areas associated with a Zip Code area.

In addition, areas where local telephone franchises do not exist are identified on the maps. These are referred to as "unfiled territory," and generally reflect areas such as state or federal parks or forests. In no case was any cable company, or other alternative facilities-based supplier of voice service found to have operations in areas identified as "unfiled" telephone company service areas.

COUNTY LEVEL RESULTS

Alameda County

According to recent Census Bureau estimates, Alameda County has a population of about 1.5 million, residing in about 520,000 households. Alameda County has a lower percentage of white and a higher percentage of black residents than the statewide average (48.1% white and 13.0% black for Alameda, compared to the statewide averages of 60.26% white and 6.19% black). Alameda County has a relatively higher percentage of residents identified as Asian (24.8% vs. 12.3% statewide). Alameda has a lower percentage of Hispanic/Latino residents (21.4% Alameda County vs. 36.1% Statewide). Median household income in Alameda County ($68,740) is about $19,000 above the statewide average. About 11.4% of the population of Alameda County lives in poverty level. Statewide, 13.0% of the population lives in poverty.

Map AL-1, on the following page, shows city locations and urban areas in Alameda County. A substantial portion of the western portion of the county is urbanized. Non-urbanized areas in the southwest portion of the county reflect both industrialized areas, farmland, and coastal lands. The non-urban areas located between the San Francisco/Oakland/San Jose corridor, and Dublin and Livermore to the east reflect lightly populated regions of the Coastal Range. The large nonurbanized area to the southeast is lightly populated, with some agricultural activity. In general, the urbanized areas are where alternative voice facilities were found, with some areas immediately outside of urbanized areas having alternative voice services available.

Alameda County is served by the ILEC AT&T and also includes a substantial unfiled territory. The only cable service provider in Alameda County is Comcast. The research methodology investigated service availability in all Zip Code areas in the county, and found that in addition to AT&T services, voice service was offered in Comcast's service area. There is no evidence of cable overbuilder activity in Alameda County. At one time, Alameda Power and Telecom provided some telecommunications services, but has sold its telecommunications customer base to Comcast.[9]

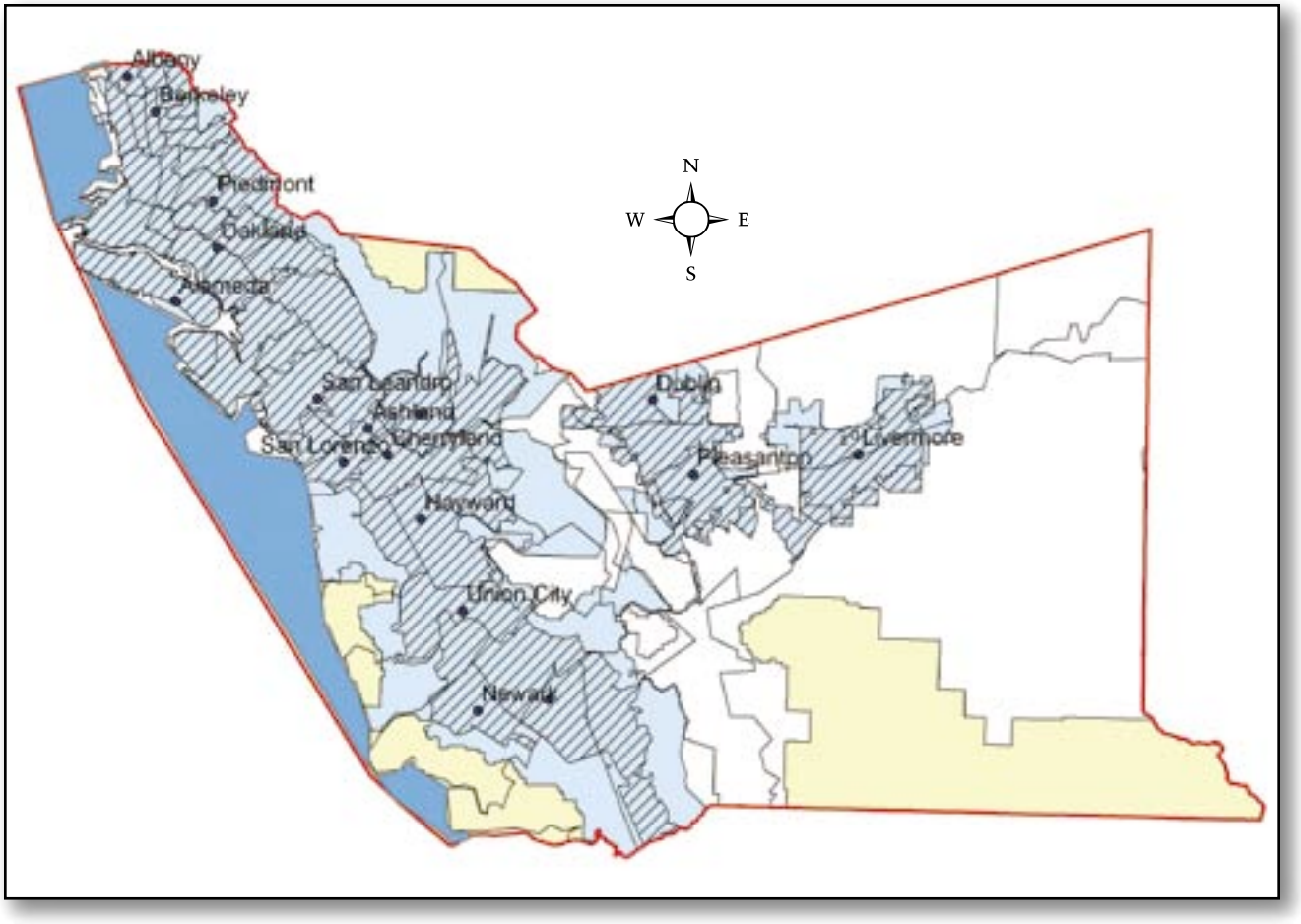
In Alameda County, some consumers can choose between the facilities-based telephone service offered by AT&T or Comcast. Others still have only one choice—AT&T. Map AL-1 shows the geographic areas, and the choices available. As is the case with the other geographic areas studied, the reporting of voice service availability is on a Zip Code basis, and that tends to overstate the geographic reach of where consumers have a choice in some of the Zip Code areas shown. In the light blue colored areas outside of the marked urban areas consumers do not consistently have choice.

In summary, in Alameda County, consumers residing in urban areas are likely to be able to choose between AT&T and Comcast. As discussed in the body of the report, because Comcast does not offer à la carte options, the choice of Comcast is more likely to be an alternative for those consumers that prefer packages and bundles, and who have the income to afford those alternatives.

9 http://www.alamedamp.com/internet/

Map AL-1

Alameda Choices



CHOICES OF FACILITIES-BASED LOCAL SERVICE PROVIDERS IN ZIP CODE AREA

- County Boundary
- Urban Areas
- Zip Boundary
- AT&T or Comcast
- AT&T Only
- Unfiled Territory
- Water

Fresno County

According to recent Census Bureau estimates, Fresno County has a population of about 900,000 residing in about 280,000 households. Fresno County has a slightly higher percentage of white, and a lower percentage of black, residents than the statewide average (62.4% white and 4.9% black for Fresno, compared to the statewide averages of 60.26% white and 6.19% black). Fresno County has a relatively lower percentage of residents identified as Asian (8.7% vs. 12.3% statewide). Fresno has a higher percentage of Hispanic/Latino residents (48.2% Fresno County vs. 36.1% Statewide). Median household income in Fresno County ($47,298) is about $2,500 below the statewide average. About 20.6% of the population of Fresno County lives in poverty. Statewide, 13.0% of the population lives in poverty.

Map F-1, on the following page, shows the urban population characteristics of Fresno County. In addition to Fresno City, a number of smaller communities exhibit urban characteristics, such as Coalinga, Firebaugh, Sanger, and Selma. The non-urbanized areas in the western portion of the county are agricultural areas that have low-density population. In the eastern portion of the county geographic characteristics transition from farmland to the foothills of the Sierra Nevada mountains. In general, the urbanized areas are where alternative voice facilities were found, with some areas immediately outside of urbanized areas having alternative voice services available.

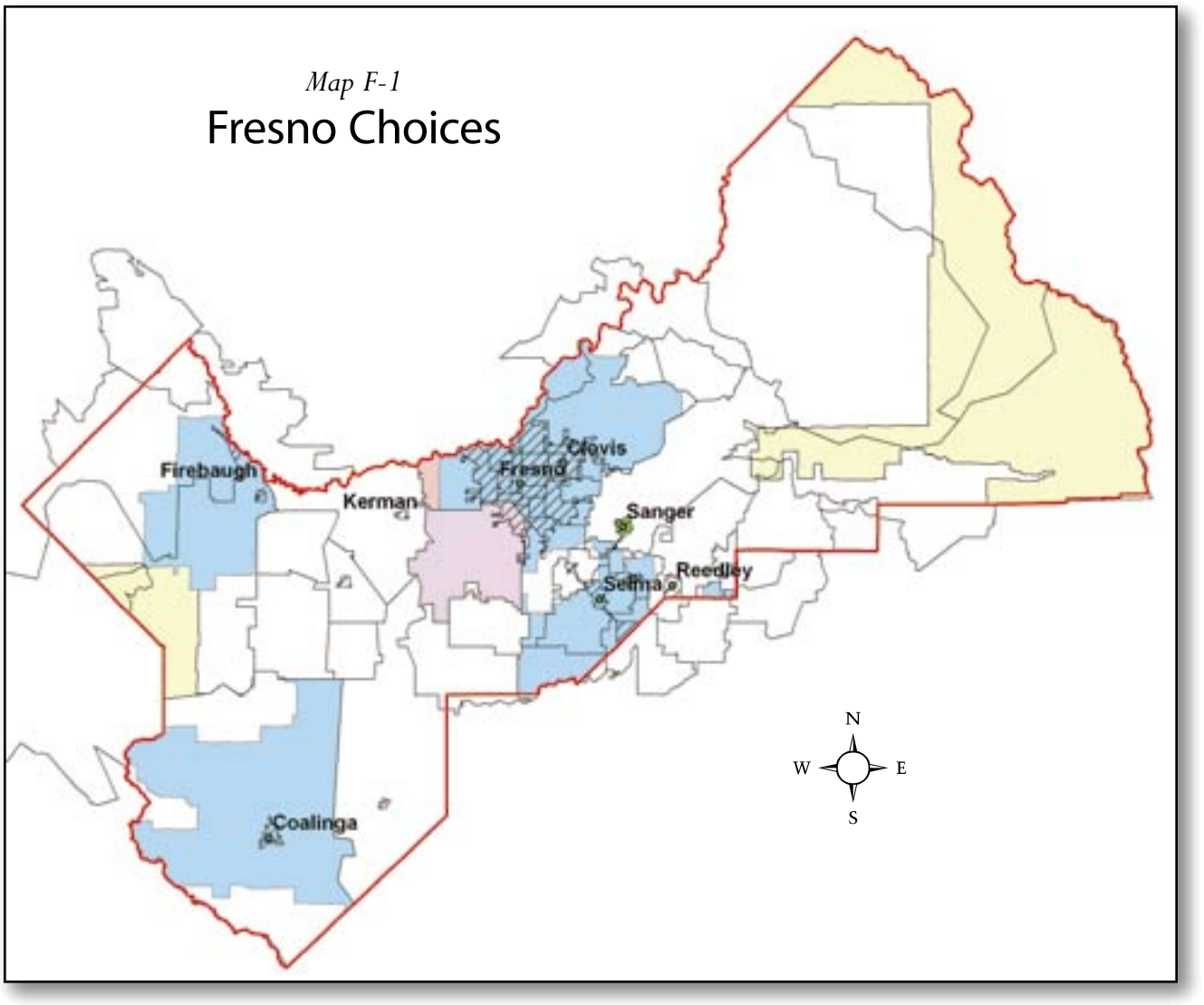
With regard to ILEC services, portions of Fresno County are served by AT&T or Verizon, or by independent telephone companies Kerman and Ponderosa. There are also unfiled service areas in the county. While there are multiple ILECs operating in the county, consumers cannot choose between these companies for local telephone services. The cable service providers in Fresno County are Comcast and Charter, with Comcast serving the much larger area. The research methodology applied investigated voice telephone service availability in all Zip Code areas in the county, and found that voice service was available in the majority of Comcast's service area, although not in some of the rural portions of the service area. Charter, which serves a much smaller portion of the county, does not have voice service available in its service area. There is no evidence of cable overbuilder activity in Fresno County.

In Fresno County, some consumers can choose between the facilities-based telephone service offered by AT&T or Comcast. In other areas some consumers can choose between Verizon and Comcast, or Kerman and Comcast. Others still have only one choice—their local ILEC. Map F-1 shows the geographic areas, and the choices available. As is the case with the other geographic areas studied, the reporting of voice service availability is on a Zip Code basis, and that tends to overstate the geographic reach of where consumers have a choice in some of the Zip Code areas shown. Unless otherwise noted, in the shaded areas outside of the marked urban areas consumers do not consistently have choice.

In summary, in Fresno County, consumers that reside in or near Fresno City, and in some other urban areas are likely to be able to choose between AT&T or Comcast. As discussed in the body of the report, because Comcast does not offer à la carte options, the choice of Comcast is more likely to be an alternative for those consumers that prefer packages and bundles, and who have the income to afford those alternatives. Consumers residing in other areas of the county are much less likely to have choice.

Map F-1

Fresno Choices



CHOICES OF FACILITIES-BASED LOCAL SERVICE PROVIDERS IN ZIP CODE AREA

- County Boundary
- Urban Areas
- Zip Boundary
- AT&T or Comcast (Extends Outside of Urban Area)
- AT&T or Comcast
- Verizon or Comcast
- Kerman or Comast
- ILEC Only
- Unfiled Territory

Humboldt County

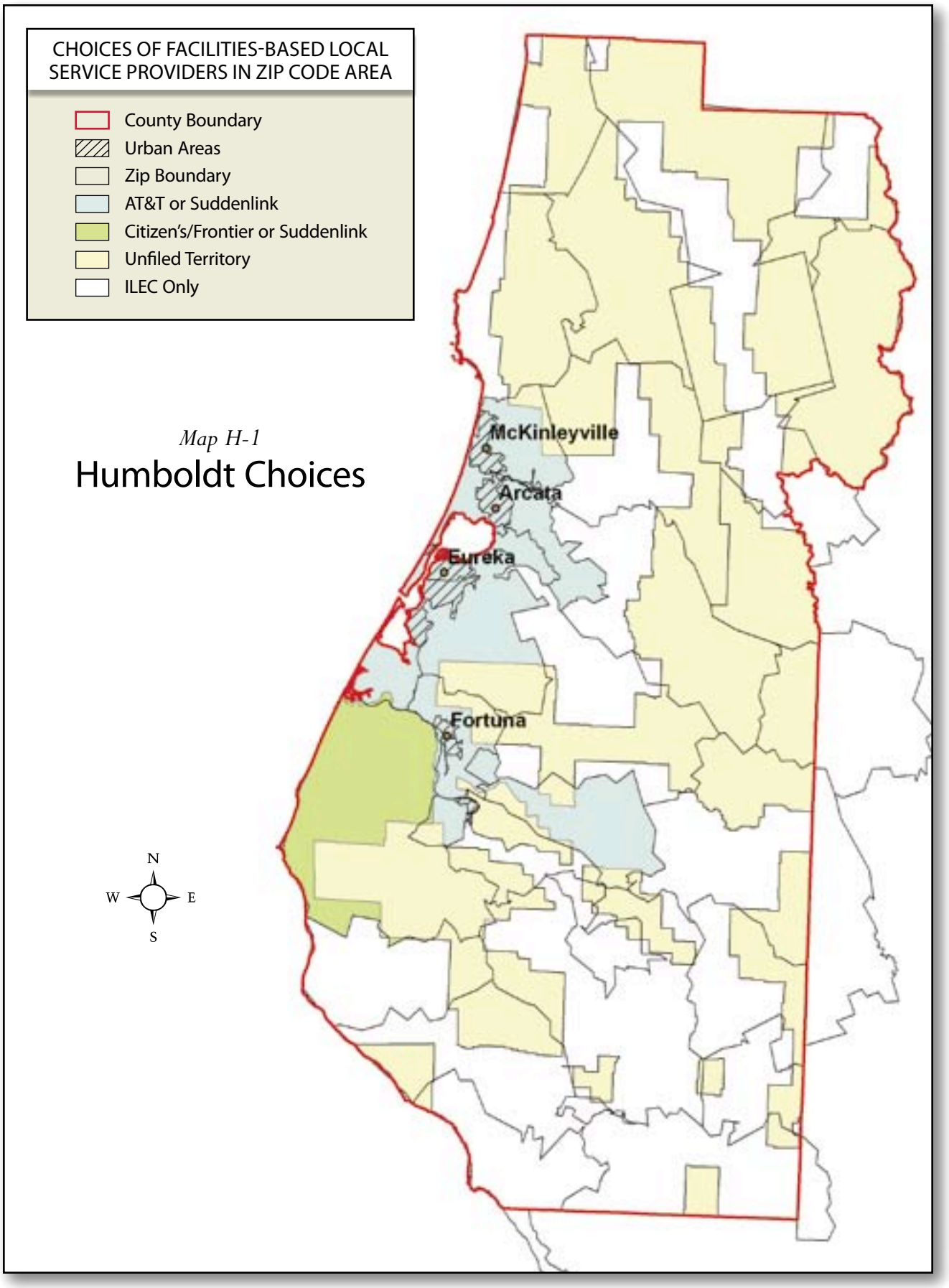
According to recent Census Bureau estimates, Humboldt County has a population of about 129,000 residing in about 52,000 households. Humboldt County has a much higher percentage of white and a lower percentage of black residents than the statewide average (82.0% white and 1.2% black for Humboldt, compared to the statewide averages of 60.26% white and 6.19% black). Humboldt County has a lower percentage of residents identified as Asian (2.6% vs.12.3% statewide). Humboldt has a lower percentage of Hispanic/Latino residents (8.1% Humboldt County vs. 36.1% Statewide). Median household income in Humboldt County($36,870) is about $13,000 below the statewide average. About 16.9% of the population of Humboldt County lives in poverty. Statewide, 13.0% of the population lives in poverty.

Map H-1, on the following page, shows the urban population characteristics of Humboldt County. Eureka is the largest of the areas in the County classified by the Census Bureau as urban. In addition to Eureka, other communities exhibit urban characteristics, such as Arcata, Fortuna, and McKinleyville. The non-urbanized areas in the balance of the county are rugged areas that generally have low-density population. In general, the urbanized areas are where alternative voice facilities were found, with some areas immediately outside of urbanized areas having alternative voice services available.

Humboldt County ILECs include AT&T California, Citizens/Frontier, Verizon, or Siskiyou Telephone. While there are multiple ILECs operating in the county, consumers cannot choose between these companies for local telephone services. Three cable companies have operations in Humboldt County: Almega Cable, Suddenlink, and Wave Broadband. These companies operate within their franchise areas and consumers cannot choose between them. Only SuddenLink was found to offer voice services. There is no evidence of cable overbuilder activity in Humboldt County.

In Humboldt County, some consumers can choose between the facilities-based telephone service offered by AT&T or SuddenLink. In other areas some consumers can choose between Citizens/ Frontier or SuddenLink. Others still have only one choice—their ILEC. Map H-1 shows the geographic areas, and the choices available. As is the case with the other geographic areas studied, the reporting of voice service availability is on a Zip Code basis, and that tends to overstate the geographic reach of where consumers have a choice in some of the Zip Code areas shown. In the shaded areas outside of the marked urban areas consumers do not consistently have choice.

In summary, in Humboldt County consumers that reside in or near Eureka, and in other more densely populated areas are likely to have one alternative choice, if they reside in SuddenLink's service area. As discussed in the body of this report, SuddenLink only offers voice services as a package, which may not be desired by all consumers. Consumers residing in other areas of the county are unlikely to have any alternative.



Map H-1

Humboldt Choices

Los Angeles County

According to recent Census Bureau estimates, Los Angeles County has a population of about 9.88 million, residing in about 3.2 million households. Los Angeles County has a lower percentage of white and a higher percentage of black residents than the statewide average (49.9% white and 8.8% black for Los Angeles, compared to the statewide averages of 60.26% white and 6.19% black). Los Angeles County has a slightly higher percentage of residents identified as Asian (13.1% vs. 12.3% statewide). Los Angeles has a higher percentage of Hispanic/Latino residents (46.8% Los Angeles County vs. 36.1% Statewide). Median household income in Los Angeles County ($53,573) is about $3,500 above the statewide average. About 15.4% of the population of Los Angeles County lives in poverty. Statewide, 13.0% of the population lives in poverty.

Map LA-1, on the following page, shows the urban characteristics of Los Angeles County. Much of Los Angeles County is classified as urban. In the northern/northwest portion of the county communities such as Lancaster, Palmdale, and Lake Los Angeles are located, surrounded by low population density desert and mountainous terrain. Santa Clarita is an urban area in the northeast portion of the county. Most urbanized areas in Los Angeles County were found to have an alternative voice service provider.

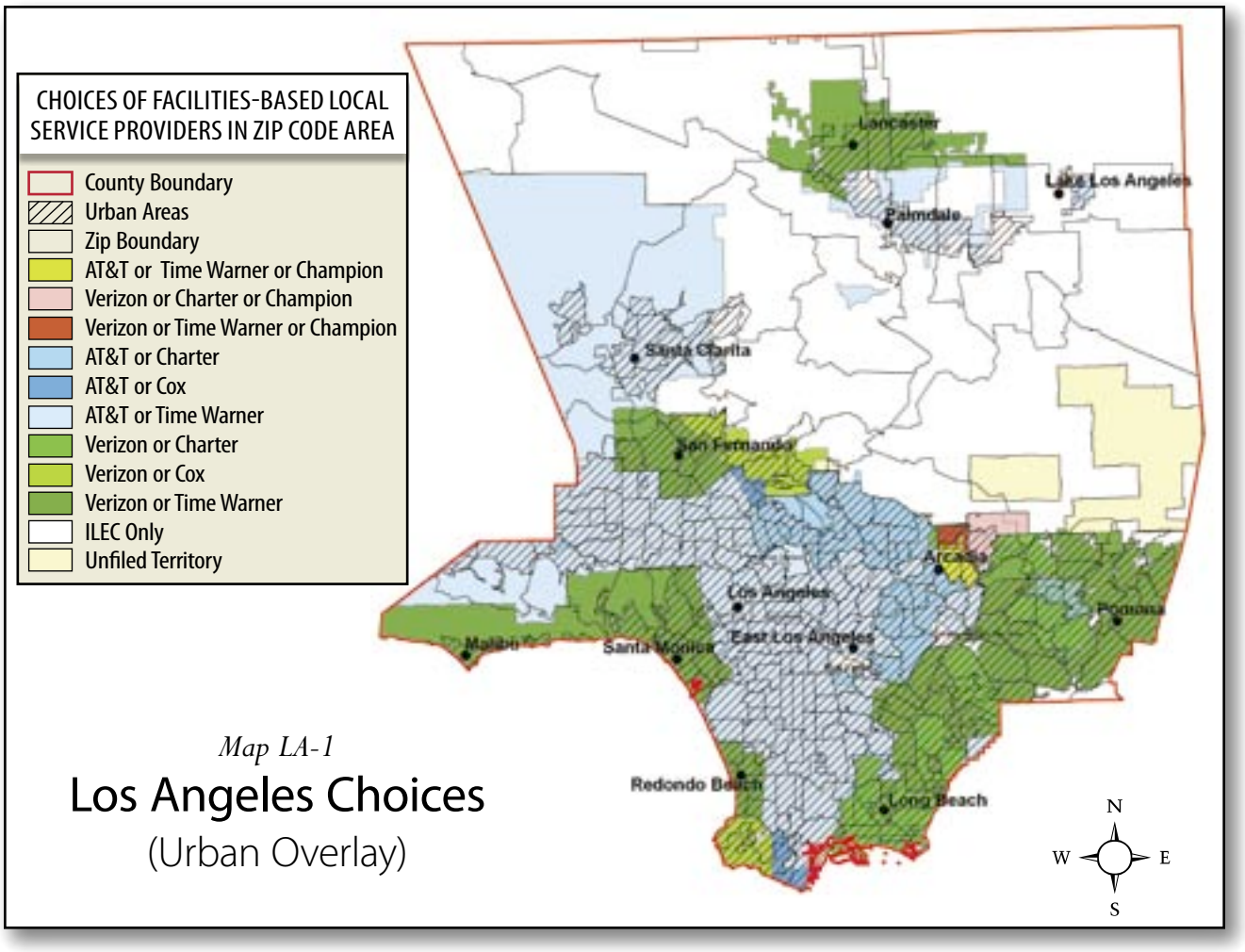
AT&T and Verizon are the ILECs operating in Los Angeles County. While there are two ILECs operating in the county, consumers cannot choose between these companies for local telephone services. Several cable companies operate in Los Angeles County. Time Warner Cable, Charter Communications, Cox, and Catalina Cable (which serves only Catalina Island) provide service in Los Angeles County, however, Time Warner provides service in the largest geographic footprint. Generally, consumers cannot choose between cable service providers. There is some cable overbuild activity in Los Angeles County. Champion Broadband, which took over facilities from RCN, has service in a limited area in Arcadia and Monrovia. MediaPrints™ indicates that Charter Communications is an overbuilder in Time Warner's service area in Los Angeles. The research found no evidence of Charter Communications offering service in Time Warner's Los Angeles service

Table A-1:
Los Angeles Choices

Consumers Residing in AT&T's service area
AT&T or Charter
AT&T or Cox
AT&T or Time Warner
AT&T or Time Warner or Champion
AT&T Alone (No Choice)
Consumers Residing in Verizon Service Area
Verizon or Charter
Verizon or Cox
Verizon or Time Warner
Verizon or Time Warner or Champion
Verizon or Charter or Champion
Verizon Alone (No Choice)

area. In addition to Charter's web-based service locator,[10] Charter customer service representatives indicate that service from Charter was not available inside Time Warner's service territory. To the extent that Charter is planning on overbuilding in Time Warner's service area, given Charter's bankruptcy,[11] at what pace future buildout activities, if any, will take place is not clear.

Table A-1, on the prior page, identifies the choices that are available to consumers residing in Los Angeles County, depending on the location of their residence. Depending on their location, most Los Angeles consumers can choose between their local telephone company or a cable voice service provider. Some Los Angeles consumers have the added choice of Champion Broadband, that serves a limited area around Arcadia and Monrovia. Map LA-1 shows the choices of facilities based voice service providers based on the results of the research methodology. In the more densely populated areas of the county, the research indicates that consumers have two choices of facilities-based voice services. In the shaded areas outside of the marked urban areas consumers do not consistently have choice. This is especially so in the Zip Code areas in the western areas of the county that fall outside of the urban boundaries.



Map LA-1

Los Angeles Choices

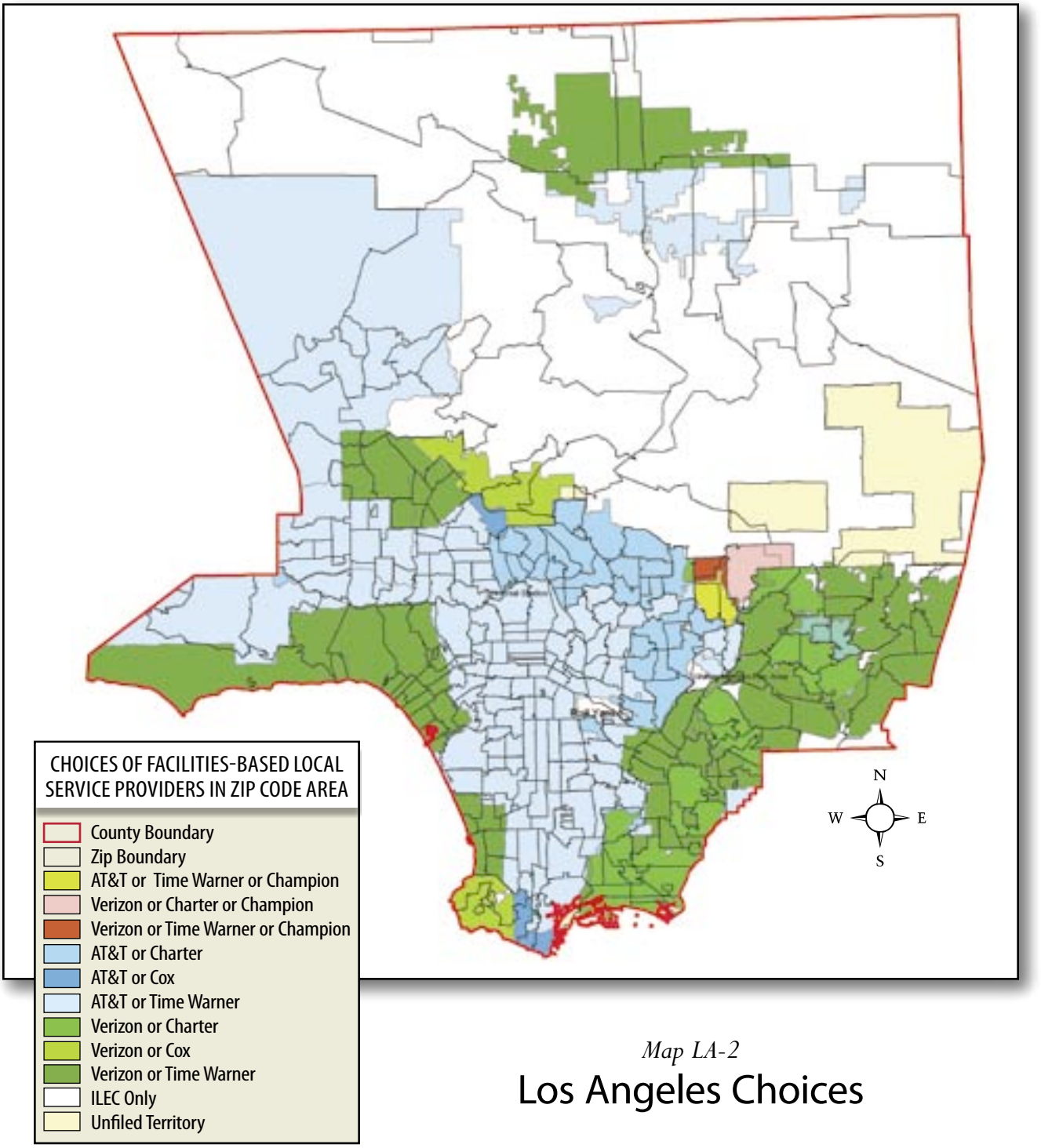
(Urban Overlay)

10 In areas identified by MediaPrints™ as having a Charter overbuild, Charter's service locator tool was used to check for availability. In each case, Charter indicated that service was not available, and further indicated, through a link to a service availability checker, that Time Warner was the service provider in the area.

11 "Wave of Bad Debt Swamps Companies," *Wall Street Journal*, February 13, 2009. *http://online.wsj.com/article/SB123446235205578373.html?mod=testMod*

Map LA-2, below, removes the urban area identification and city names to more clearly display the choices in Zip Code Areas.

In summary, in Los Angeles County, consumers generally can choose between their ILEC and a cable provider. Some may have one additional choice. As discussed in the body of this report, Charter and Time Warner only offer voice service packages, and Time Warner's VoIP service has technical limitations that may not make the service a reasonable choice. Champion broadband offers voice services only in a bundle with broadband, which raises the cost of this alternative. Consumers residing in rural areas of the county are much less likely to have choice.



Map LA-2

Los Angeles Choices

Madera County

According to recent Census Bureau estimates, Madera County has a population of about 146,000 residing in about 43,000 households. Madera County has a higher percentage of white and a lower percentage of black residents than the statewide average (78.9% white and 4.0% black for Madera, compared to the statewide averages of 60.26% white and 6.19% black). Madera County has a lower percentage of residents identified as Asian (2.0% vs. 12.3% statewide). Madera has a higher percentage of Hispanic/Latino residents (50.2% Madera County vs. 36.1% Statewide). Median household income in Madera County ($44,975) is about $5,000 below the statewide average. About 17.8% of the population of Madera County lives in poverty. Statewide, 13.0% of the population lives in poverty.

Map M-1, on the following page, shows the urban population characteristics of Madera County. Madera City and a number of smaller communities such as Chowchilla, Bonadelle Ranchos-Madera Ranchos, and Oakhurst exhibit urban characteristics. The non-urbanized areas in the western portion of the county are agricultural areas that generally have low-density population. In the eastern portion of the county, characteristics transition from farmland to the foothills of the Sierra Nevada mountains. In general, the urbanized areas are where alternative voice facilities were found, with some areas immediately outside of urbanized areas having alternative voice services available.

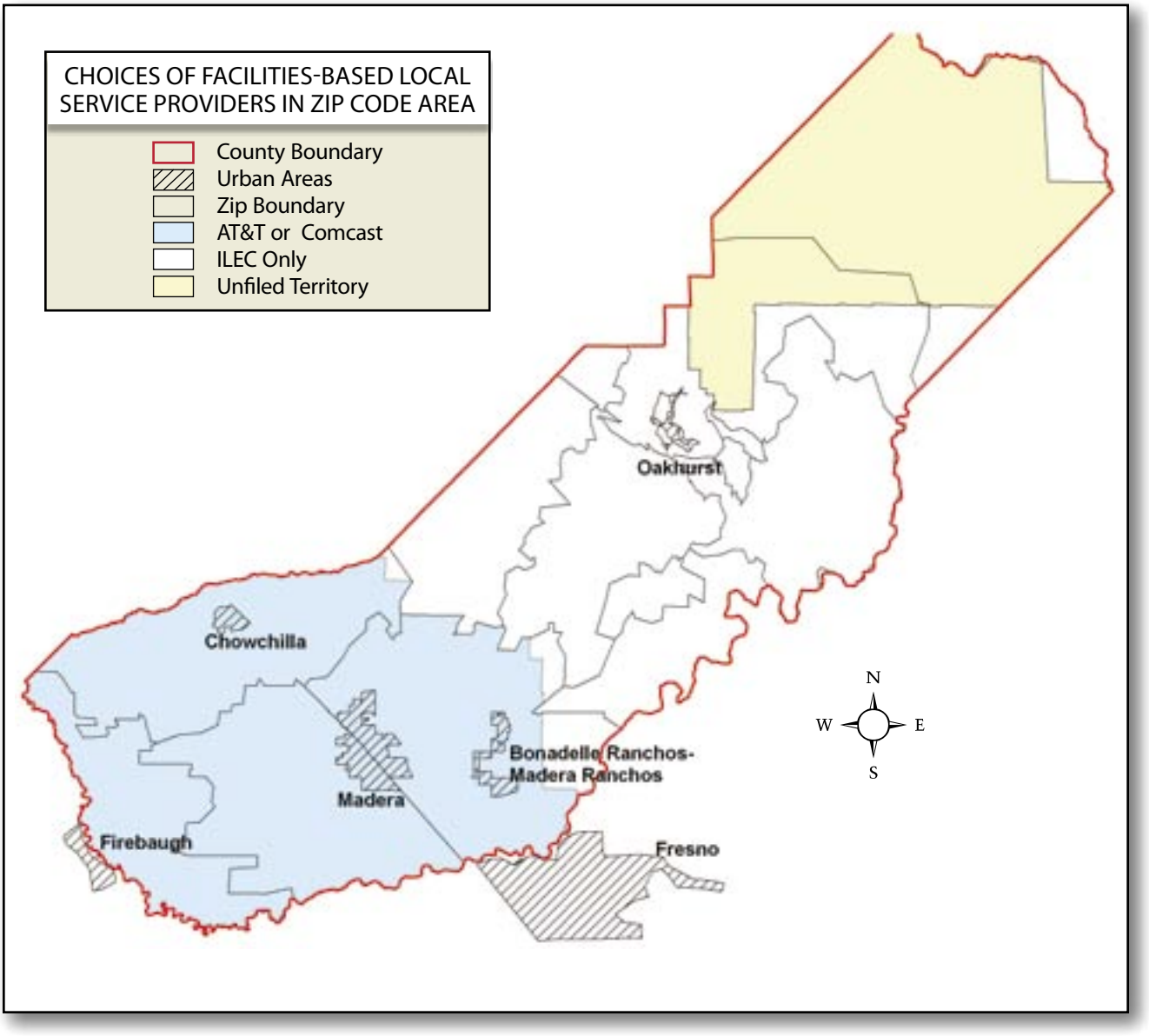
AT&T, Verizon, Ponderosa Telephone, or Sierra Telephone, provide telephone service in the county, and the county also includes substantial unfiled territory. While there are multiple ILECs operating in the county, consumers cannot choose between these companies for local telephone services. The primary cable service provider in Madera County is Comcast. Northland Cable also serves a small area in and around Oakhurst. The research methodology investigated service availability in all Zip Code areas in the county, and found that voice service was offered in the majority of Comcast's service area. Northland Cable, which serves a much smaller portion of the county, does not have voice service available in its service area. There is no evidence of cable overbuilder activity in Madera County.

In Madera County, some consumers can choose between the facilities-based telephone service offered by AT&T or Comcast. Others still have only one choice—their ILEC. Map M-1 shows the geographic areas, and the choices available. As is the case with the other geographic areas studied, the reporting of voice service availability is on a Zip Code basis, and that tends to overstate the geographic reach of where consumers have a choice in some of the Zip Code areas shown. In the shaded areas outside of the marked urban areas consumers do not consistently have choice.

In summary, in Madera County, consumers that reside in and around urban areas in the southwest portion of the county are likely to have the choice of AT&T or Comcast. As discussed in the body of the report, because Comcast does not offer à la carte options, the choice of Comcast is more likely to be an alternative for those consumers that prefer packages and bundles, and who have the income to afford those alternatives. Consumers residing in other areas of the county are much less likely to have choice.

Map M-1

Madera Choices



Sacramento County

According to recent Census Bureau estimates, Sacramento County has a population of about 1.4 million, residing in about 500,000 households. Sacramento County has a slightly higher percentage of white and a higher percentage of black residents than the statewide average (61.8% white and 10.1% black for Sacramento, compared to the statewide averages of 60.26% white and 6.19% black). Sacramento County has a slightly higher percentage of residents identified as Asian (13.6% vs. 12.3% statewide). Sacramento has a lower percentage of Hispanic/Latino residents (19.6% Sacramento County vs. 36.1% Statewide). Median household income in Sacramento County ($56,978) is about $7,000 above the statewide average. About 12.5% of the population of Sacramento County lives in poverty. Statewide, 13.0% of the population lives in poverty

Map Sac-1, on the following page, shows the urban population characteristics of Sacramento County. In addition to the main core urban area that runs from Citrus Heights near the northern border of the county, through Sacramento City, on to the Elk Grove area, other smaller communities that exhibit urban characteristics include Lodi in the south, and Rancho Murieta in the east. The non-urbanized areas in the eastern portion of the county are marginal agricultural areas and transition into the foothills of the Sierra Nevada range. These areas exhibit low density population. In the southern portion of the county, characteristics transition from urban to farmland. In general, the urbanized areas are where alternative voice facilities were found, with some areas immediately outside of urbanized areas also having alternative voice services available.

AT&T California, Citizens/Frontier, or SureWest provide telephone services in the county. Cable television services in Sacramento County are provided by Comcast.[12] Sacramento is served by one overbuilder, SureWest Broadband, that is affiliated with SureWest's ILEC operations.

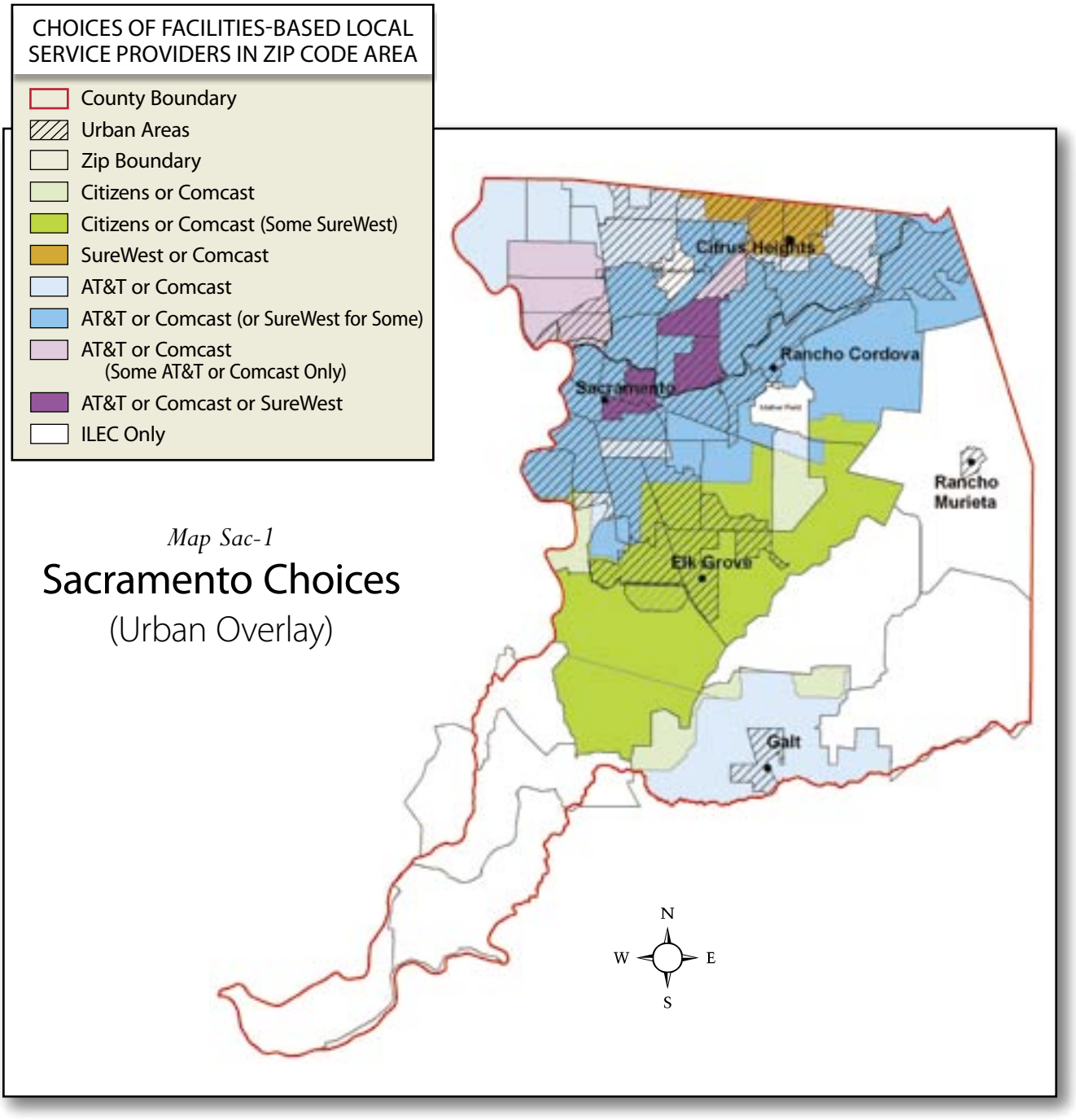
Thus, Sacramento was unique among the areas studied in that one ILEC, SureWest, has extended facilities into the service areas of abutting the ILECs AT&T and Citizens/Frontier. However, this overbuild does not reach all consumers. Table A-2, above, summarizes the choices that Sacramento consumers may have, depending on where they live.

Table A-2:
Sacramento Choices

Consumers Residing in AT&T's service area
AT&T or Comcast
AT&T or Comcast or SureWest Broadband
AT&T Alone (No Choice)
Consumers Residing in SureWest Service Area
SureWest or Comcast
Consumers residing in Citizens/Frontier Service Area
Citizens/Frontier or Comcast
Citizens/Frontier or Comcast or SureWest Broadband
Citizens/Frontier Alone (No Choice)

12 MediaPrints™ indicates that Wave Broadband serves in Sacramento County However, research indicates that this is not the case. Rancho Murieta is served by a private association cable provider that does not offer voice services.

In Sacramento County, consumers that reside in AT&T's service area can choose between the facilities-based telephone service offered by AT&T or Comcast. Alternatively, in Citizens/Frontier's service area, consumers can generally choose between Citizens/Frontier and Comcast. Some of these consumers can add SureWest Broadband to the choices identified above. However, others still have only one choice—their ILEC. Map Sac-1 shows the geographic areas, and the choices available. As is the case with the other geographic areas studied, the reporting of voice service availability is on a Zip Code basis, and that tends to overstate the geographic reach of where consumers have a choice in some of the Zip Code areas shown. In the shaded areas outside of the marked urban areas consumers do not consistently have the choices identified. Map Sac-2, on the following page, removes the urban overlay and city names to more clearly show variation in choices in the Zip Code areas.

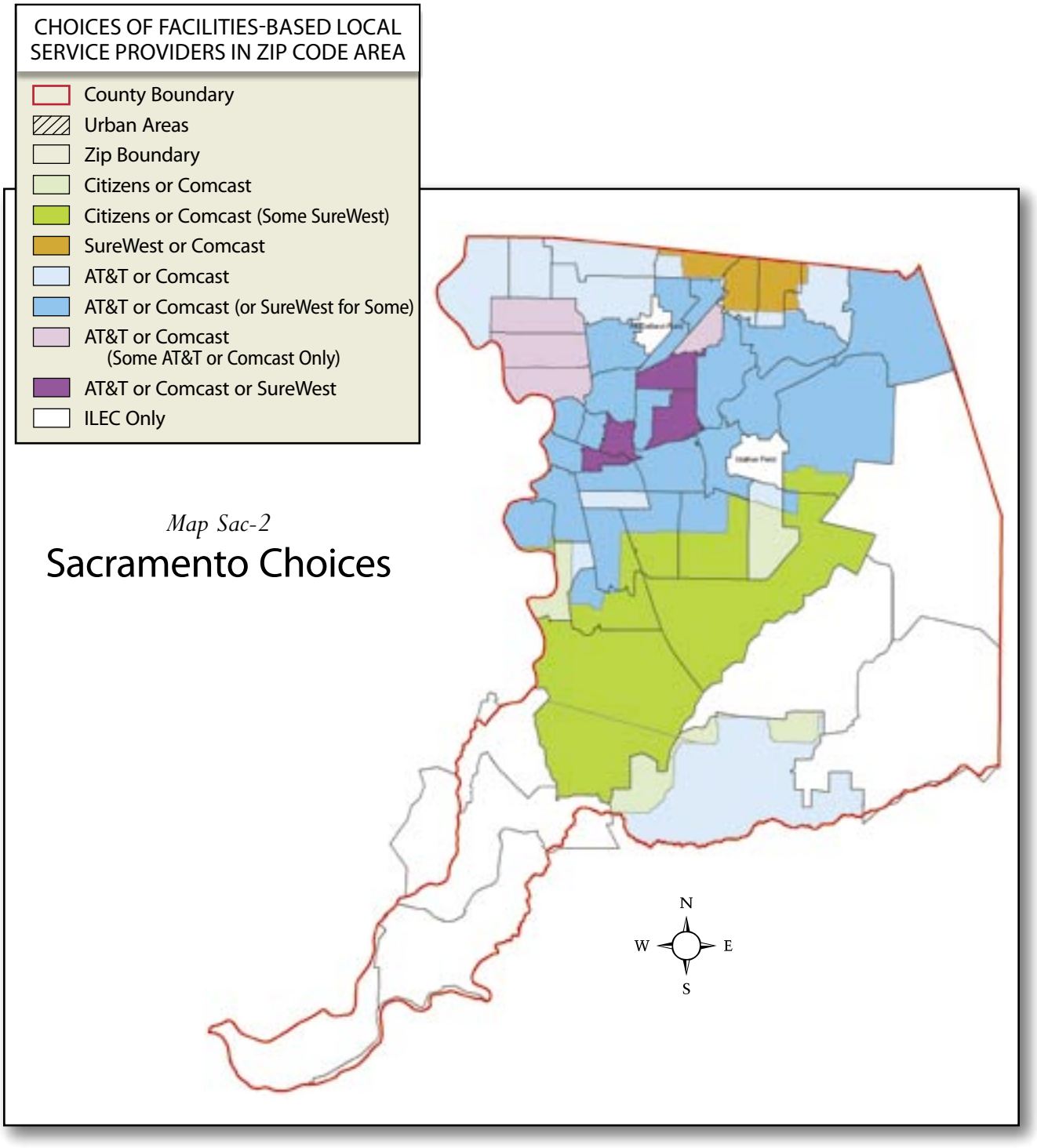


Map Sac-1

Sacramento Choices

(Urban Overlay)

In summary, in Sacramento County, consumers residing in urban areas are likely, depending on where they live, to be able to choose between AT&T and Comcast, or SureWest and Comcast, or Citizens/Frontier and Comcast. For a smaller subset of consumers, an additional choice of SureWest Broadband may exist. As discussed in the body of the report, because Comcast does not offer à la carte options, the choice of Comcast is more likely to be an alternative for those consumers that prefer packages and bundles, and who have the income to afford those alternatives. SureWest Broadband also promotes packages and bundles, and requires broadband subscription for some telephone services. Consumers residing outside of urban areas of the county are much less likely to have choice.



Map Sac-2

Sacramento Choices

San Bernardino County

According to recent Census Bureau estimates, San Bernardino County has a population of about 1.98 million, residing in about 590,000 households. San Bernardino County has a lower percentage of white and a higher percentage of black residents than the statewide average (56.9% white and 12.1% black for San Bernardino, compared to the statewide averages of 60.26% white and 6.19% black). San Bernardino County has a relatively lower percentage of residents identified as Asian (5.9% vs. 12.3% statewide). San Bernardino has a higher percentage of Hispanic/Latino residents (46.8% San Bernardino County vs. 36.1% Statewide). Median household income in San Bernardino County ($56,428) is about $6,500 above the statewide average. About 13.7% of the population of San Bernardino County lives in poverty. Statewide, 13.0% of the population lives in poverty.

Map SB-1, on the following page, shows the urban population characteristics of San Bernardino County. In addition to the main core urban area that is in the southwest corner of the county, other smaller communities that exhibit urban characteristics include Barstow, Victorville, Twenty-Nine Palms, Big Bear Lake, and Yucca Valley. The non-urbanized areas in the northern and eastern portion of the county are primarily desert areas with low-density population. In general, the urbanized areas are where alternative voice facilities were found, with some areas immediately outside of urbanized areas also having alternative voice services available.

Portions of San Bernardino County are served by Verizon, AT&T, Citizens/Frontier or Ponderosa Telephone. There are substantial portions of San Bernardino County that are unserved. While there are multiple ILECs operating in the county, consumers cannot choose between these companies for local telephone services.

The primary cable service providers in San Bernardino County are Time Warner and Charter, which operate in the southwest corner of the county. Within the service areas of these two cable companies, voice services appear to be generally available. According to MediaPrints, Rapid Cable has operations in the southeast corner of the county, however, according to Rapid Cable customer representatives, Rapid Cable does not offer telephone service in the county.

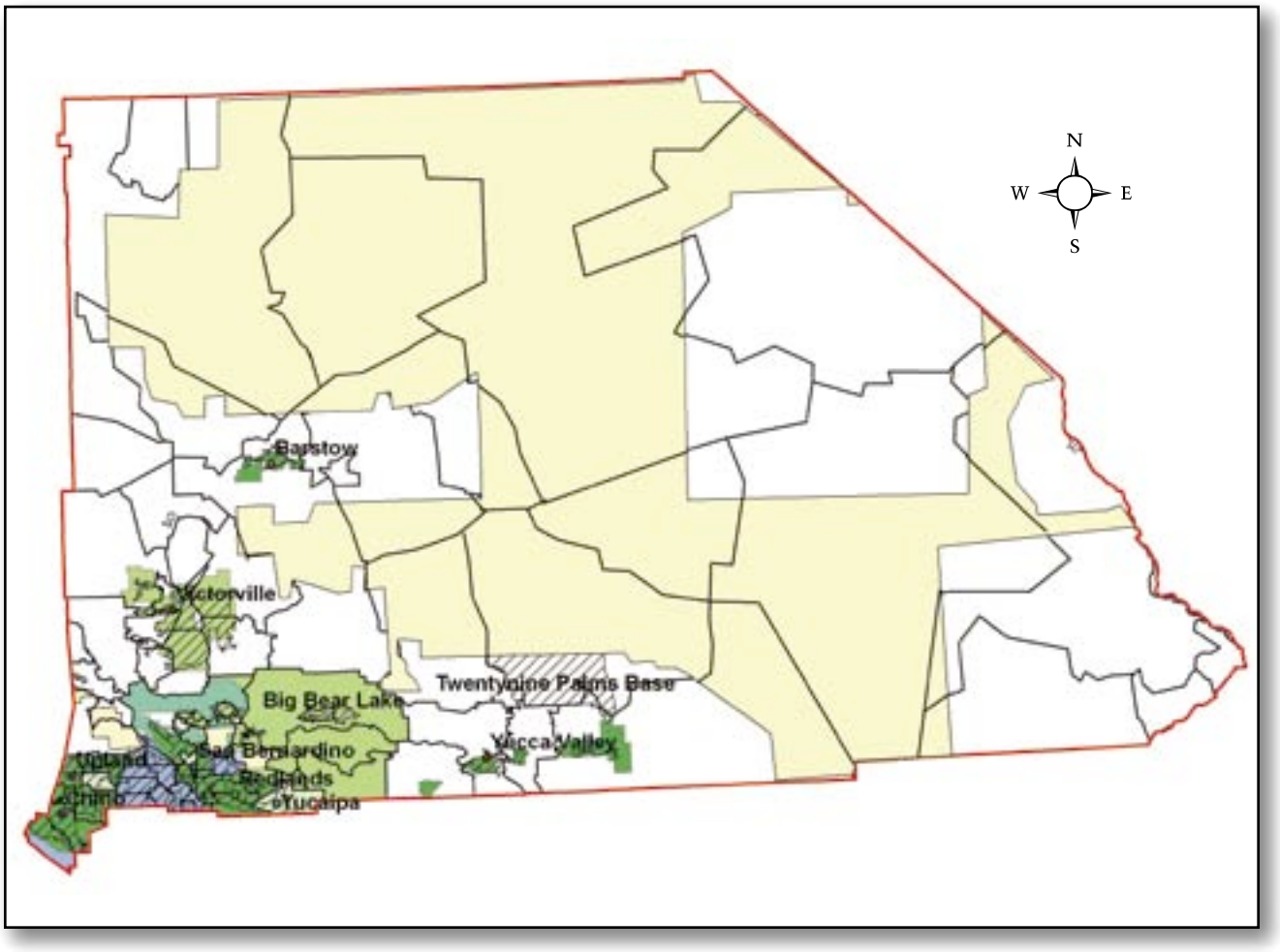
As shown in Table A-3, below, in San Bernardino County, some consumers can choose between the facilities-based telephone service offered by AT&T or their cable provider. Other consumers can choose between Verizon and one cable provider. A limited number of Verizon consumers may have an

Table A-3:
San Bernardino Choices

Consumers Residing in AT&T's Service Area
AT&T or Charter
AT&T or Time Warner
AT&T Alone (No Choice)
Consumers Residing in Verizon's Service Area
Verizon or Charter
Verizon or Time Warner
Verizon or Charter or Time Warner
Verizon Alone (No Choice)

Map SB-1

San Bernadino Choices

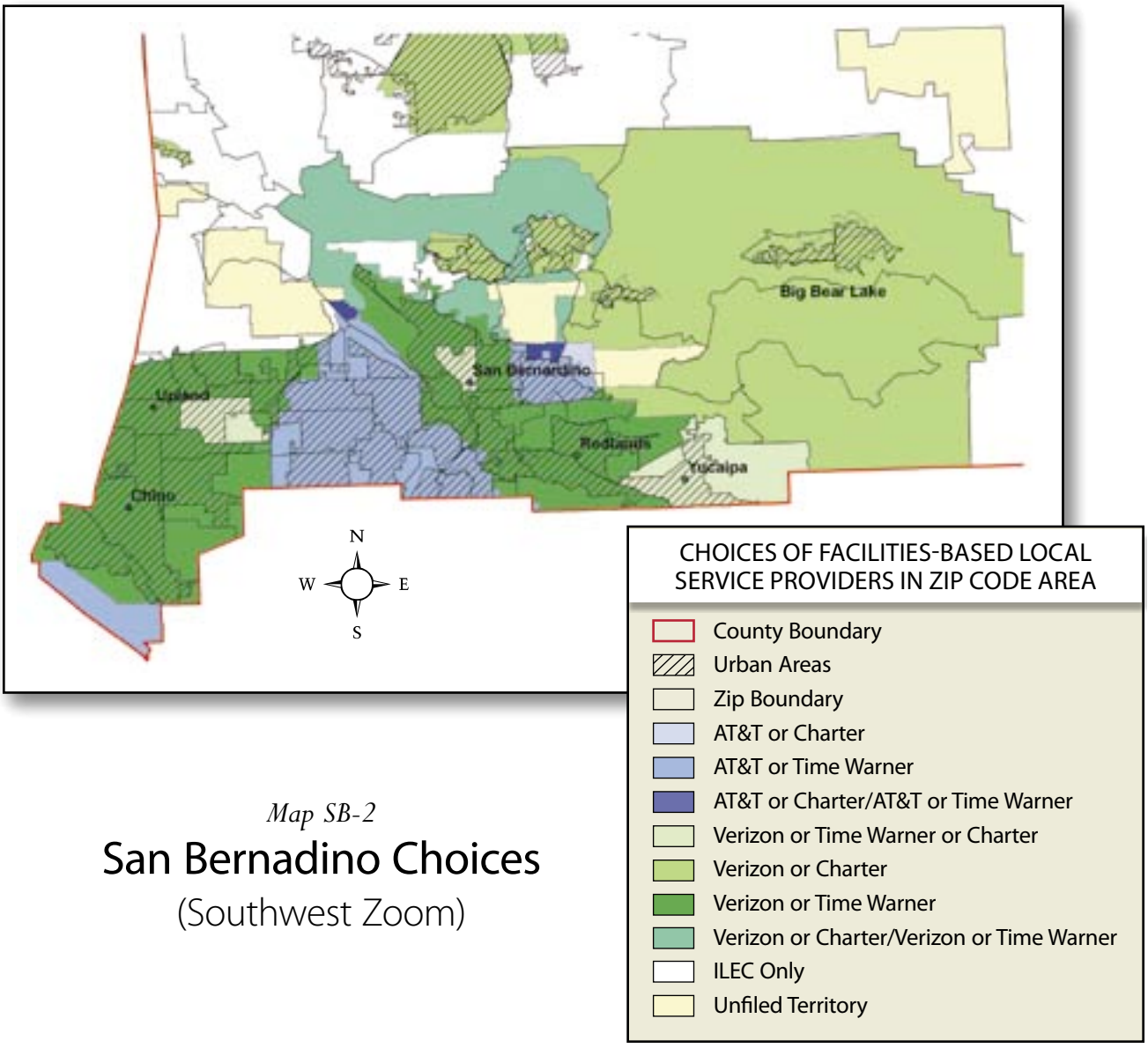


CHOICES OF FACILITIES-BASED LOCAL SERVICE PROVIDERS IN ZIP CODE AREA

- County Boundary
- Urban Areas
- Zip Boundary
- AT&T or Charter
- AT&T or Time Warner
- AT&T or Charter/AT&T or Time Warner
- Verizon or Time Warner or Charter
- Verizon or Charter
- Verizon or Time Warner
- Verizon or Charter/Verizon or Time Warner
- ILEC Only
- Unfiled Territory

additional choice, and can select between Verizon, Time Warner, or Charter (although the number of consumers that have three choices is relatively small). Others still have only one choice—their ILEC. Map SB-2, below, enlarges the southwest corner of the county to show a more detailed view of the geographic areas, and the choices available. As is the case with the other geographic areas studied, the reporting of voice service availability is on a Zip Code basis, and that tends to overstate the geographic reach of where consumers have a choice in some of the Zip Code areas shown. In the shaded areas outside of the marked urban areas consumers do not consistently have choice. This is especially so in the Zip Code areas away from the southwest corner of the county that fall outside of the urban boundaries.

In summary, in San Bernardino County, consumers that reside in the county's higher-density southwest corner generally have the ability to choose between voice service offered by their ILEC and their cable provider, and some may have an additional choice. As discussed in the body of this report, Charter and Time Warner only offer voice service packages, and Time Warner's VoIP service has technical limitations that may not make the service a reasonable choice. Consumers residing in other areas of the county are much less likely to have choice.



Map SB-2

San Bernadino Choices

(Southwest Zoom)

Santa Clara County

According to recent Census Bureau estimates, Santa Clara County has a population of about 1.75 million residing in about 582,000 households. Santa Clara County has a lower percentage of white and a lower percentage of black residents than the statewide average (53.4% white and 2.5% black for Santa Clara, compared to the statewide averages of 60.26% white and 6.19% black). Santa Clara County has a higher percentage of residents identified as Asian (30.4% vs. 12.3% statewide). Santa Clara has a lower percentage of Hispanic/Latino residents (25.7% Santa Clara County vs. 36.1% Statewide). Median household income in Santa Clara County ($84,360) is more than $34,000 above the statewide average. About 8.7% of the population of Santa Clara County lives in poverty. Statewide, 13.0% of the population lives in poverty.

Map SC-1, on the following page, shows the urban population characteristics of Santa Clara County. The main core urban area that runs from the northern border of the county includes communities such as Mountain View, Sunnyvale, Cupertino, and San Jose. In addition, Morgan Hill and Gilroy exhibit urban characteristics in the southern portion of the county. The nonurbanized areas in the western portion of the county are the costal range, that has low population density. Eastern portions of the county are also rugged terrain and exhibit low-density population. In the southern portion of the county, in the non-rugged areas, characteristics transition from farmland to urban to farmland. In general, the northern urbanized areas are where alternative voice facilities were found, with areas immediately outside of urbanized areas having alternative voice services available. The southern urbanized areas, alternative voice services were not found.

AT&T, Verizon, and Citizens/Frontier provide telephone service in the county.[13] While there are multiple ILECs operating in the county, consumers cannot choose between these companies for local telephone services. The cable service providers in Santa Clara County are Comcast and Charter.[14] The research methodology applied investigated service availability in all Zip Code areas in the county, and found that voice service was available in the majority of Comcast's service area. Charter, which serves the portion of the county around Morgan Hill and Gilroy, does not have voice service available in its Santa Clara service area. There is no evidence of cable overbuilder activity in Santa Clara County.[15]

In Santa Clara County, some consumers can choose between the facilities-based telephone service offered by AT&T or Comcast. Others still have only one choice—their local ILEC. Map SC-1 shows the geographic areas, and the choices available. As is the case with the other geographic areas studied, the reporting of voice service availability is on a Zip Code basis, and that tends to overstate the geographic reach of where consumers have a choice in some of the Zip Code areas shown. In the shaded areas outside of the marked urban areas consumers do not consistently have choice. It is notable that the urban areas in the southern portion of the county do not have choice.

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13 Citizens acquired Global Valley Networks property in eastern Santa Clara County in 2007.

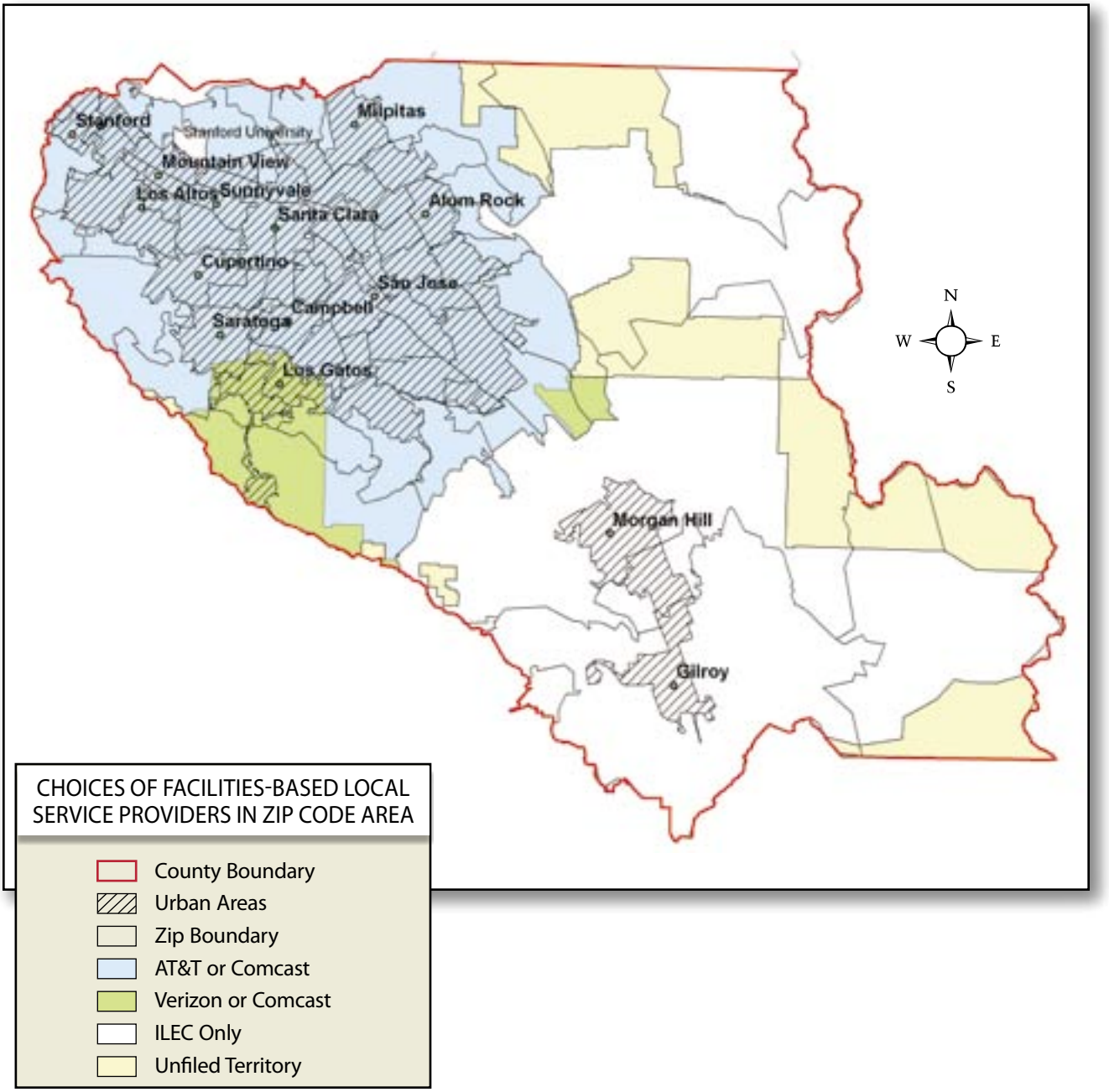
14 In Palo Alto, efforts have been underway to connect homes and businesses to a fiber-based alternative network called iPaloAlto. This project has recently stalled due to the financial crisis. See: "Economic crisis stalls Palo Alto fiber project," January 15, 2009, *http://www.ipaloalto.org/pdf/PAWeeklyOnlin_011509_stalls.pdf*

15 The MediaPrints™ data identify Matrix Cablevision and Comcast as overbuilders in the County. However, Matrix is no longer offering services, and Comcast serves in the areas that MediaPrints™ identifies as Matrix's service area. The area where MediaPrints™ shows Comcast as an overbuilder is in Comcast's primary service area.

In summary, in Santa Clara County consumers, if they reside in Comcast's service area, are likely to have one choice other than their ILEC. As discussed in the body of the report, because Comcast does not offer à la carte options, the choice of Comcast is more likely to be an alternative for those consumers that prefer packages and bundles, and who have the income to afford those alternatives. Consumers residing in other areas of the county are unlikely to have even one alternative provider.

Map SC-1

Santa Clara Choices



Shasta County

According to recent Census Bureau estimates, Shasta County has a population of about 179,000 residing in about 69,000 households. Shasta County has a higher percentage of white and a lower percentage of black residents than the statewide average (89.3% white and 0.9% black for Shasta, compared to the statewide averages of 60.26% white and 6.19% black). Shasta County has a much lower percentage of residents identified as Asian (2.5% vs. 12.3% statewide). Shasta has a much lower percentage of Hispanic/Latino residents (7.7% Shasta County vs. 36.1% Statewide). Median household income in Shasta County ($41,901) is about $8,000 below the statewide average. About 14.5% of the population of Shasta County lives in poverty. Statewide, 13.0% of the population lives in poverty.

Map Sh-1, on the following page, shows the urban population characteristics of Shasta County. Shasta County is mountainous, with relatively little urban classification other than Redding, Burney, and Cottonwood. In general, the urbanized areas around Redding are where alternative voice facilities were found, with some areas immediately outside of this urbanized area having alternative voice services available.

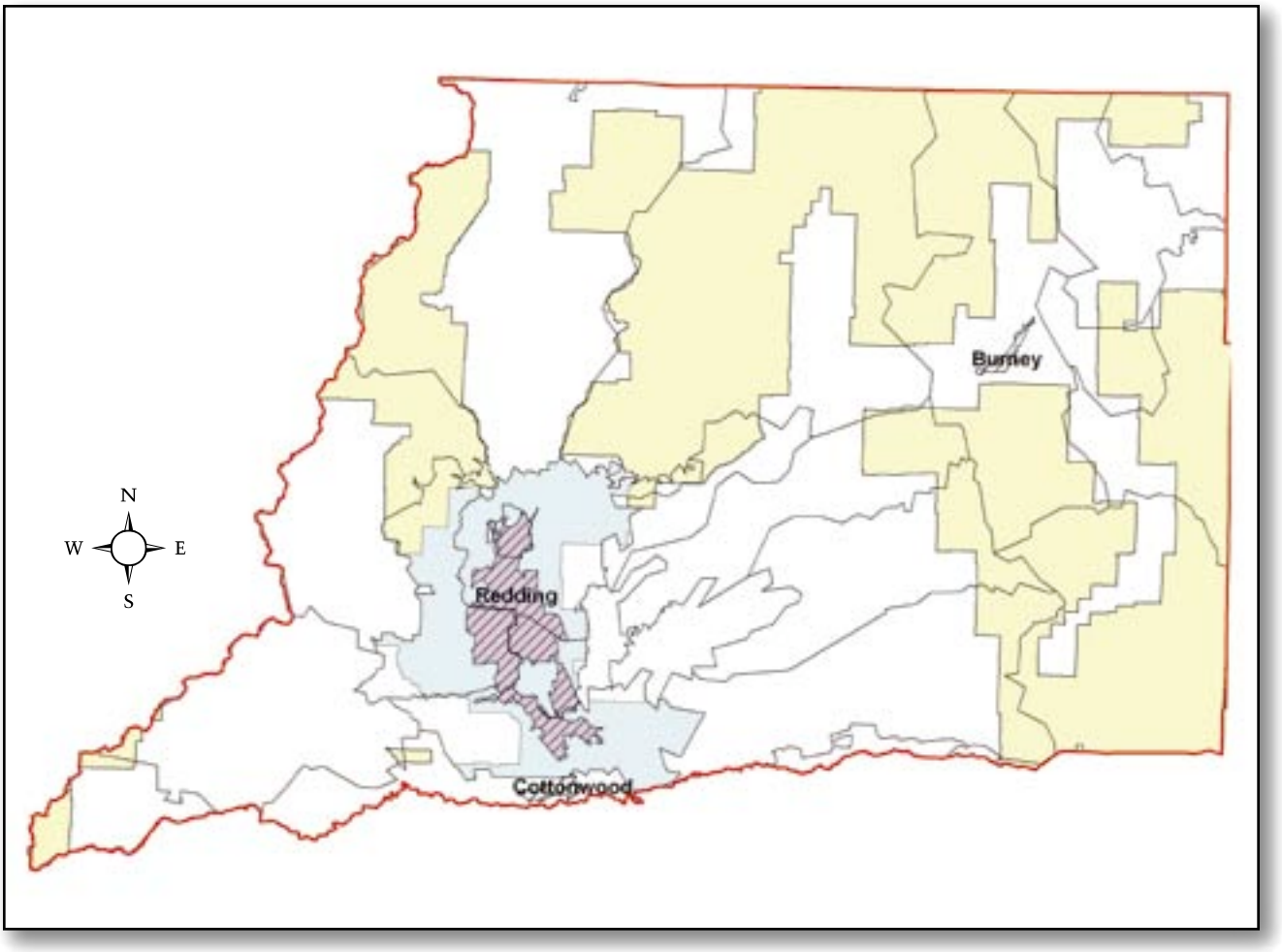
Telephone services in Shasta County are provided by AT&T, Citizens/Frontier, or TDS Telecom, and Shasta County also includes substantial unfiled territory. While there are multiple ILECs operating in the county, consumers cannot choose between these companies for local telephone services. The primary cable service provider in Shasta County is Charter Communications. Northland Cable also provides service in Shasta County, although Northland Cable does not offer voice services. Time Warner also provides service to a limited area, and also does not offer voice services. The research methodology applied investigated service availability in all Zip Code areas in the county, and found that voice service was offered by Charter Communications in an area around Redding. Clearwire is also offering wireless VoIP services around Redding in Shasta County.

In Shasta County, some consumers can choose between the facilities-based telephone service offered by AT&T or Charter. In addition, the new wireless VoIP service provided by Clearwire offers another choice, but this alternative has more technical limitations than does Charter's voice product. Others still have only one choice—their local ILEC. Map Sh-1 shows the geographic areas, and the choices available. As is the case with the other geographic areas studied, the reporting of voice service availability is on a Zip Code basis, and that tends to overstate the geographic reach of where consumers have a choice in some of the Zip Code areas shown. In the shaded areas outside of the marked urban areas consumers do not consistently have choice.

In summary, in Shasta County, consumers that reside in and around Redding are more likely to have one conventional alternative facilities-based local service provider, and the ability to choose between AT&T and Charter. Other consumers may consider Clearwire's wireless VoIP service as an additional choice. As discussed in the body of this report, Charter does not offer voice service outside of packages, and Clearwire's VoIP product has technical limitations that make it more similar to over-the-top VoIP. Furthermore, Clearwire's voice product is only sold with Clearwire's wireless broadband product. Consumers residing in other areas of the county are much less likely to have choice.

Map Sh-1

Shasta County Choices



CHOICES OF FACILITIES-BASED LOCAL SERVICE PROVIDERS IN ZIP CODE AREA

- County Boundary
- Urban Areas
- Zip Boundary
- AT&T or Charter or Clearwire
- AT&T or Charter
- ILEC Only
- Unfiled Territory

Appendix B:
Statistical Evaluation of NHIS Data

Analysis of NHIS Data

As was discussed in the body of this report, about 9% of California households are wireless only, one of the lowest percentages in the nation.[1] To further examine the factors that contribute to, or inhibit, a households decision to "cut the cord," an empirical approach was used to evaluate the role of wireless services in consumer choice. One reasonable source of data on consumer decisions regarding telephone service is the National Health Interview Survey (NHIS), which is conducted by the Census Bureau on behalf of the Centers for Disease Control and Prevention. This survey is conducted through face-to-face interviews. This avoids the problem of telephone surveys, which may not reach wireless-only households. The sample size associated with the NHIS results in more than 29,000 observations nationwide, at the family/household level.

In recent years the NHIS survey has been modified to include more detailed questions regarding telephone usage. This information is reported alongside other information regarding household characteristics, including standard demographic information and detailed health-related information. This additional information can be combined with the telephone usage information to facilitate statistical analysis of factors that influence household decisions regarding telephone service. Unfortunately, the NHIS does not collect information regarding expenditures on telephone services. This limits the ability to develop price elasticity estimates. However, the analysis of the household characteristics associated with the choice of telephone services provides important evidence regarding non-price factors that influence the choice of telephone services.

Summary of the Data

The NHIS survey results are made available on an annual basis. The 2007 survey conducted interviews of 29,266 households. Some of these households contained multiple families, which resulted in 29,915 family units being included in the interview. The approach utilized to analyze the data treated the "decision unit" as the family/household. Thus, for purposes of this analysis, there were some families that were identified as residing in "multi-family" households, however, the overwhelming majority of "decision units" are single-family households. Because of missing information on key information for some records, a total of 28,799 usable records formed the data set used in the summary analysis presented on the following page, in Table B-1.

1 Only seven (7) other states have a lower percentage of wireless-only households. See, Blumberg, S., Luke, J., Davidson, G., Davern, M., Yu, T., Soderberg, K., "Wireless Substitution: State-level Estimates From the National Health Interview Survey, January–December 2007," March 11, 2009, p. 5. *http://www.cdc.gov/nchs/data/nhsr/nhsr014.pdf*

2 As there was no reason to suspect that the missing information was the result of any systematic problem, case-wise deletion of the records with missing information was used, and will not bias the results.

Table B-1:
NHIS Survey Results—Household Choice of Telephone Services (Nationwide Data)

No Telephone Service	Wireless-Only	Wireless-Only	Both Wireline and Wireless	Telephone Households	Telephone Households with Wireline Telephone	Percent of All Telephone Households that Have Wireline Telephone
(A)	(B)	(C)	(D)	(B)+(C)+(D)	(C)+(D)	$\frac{(C)+(D)}{(B)+(C)+(D)}$
676	4,527	6,839	16,757	28,123	26,678	83.9%

The data set allows the household's choice of telecommunications services to be categorized into one of four categories: No Telephone Service; Wireless-Only; Wireline-Only; or Both Wireless and Wireline. Table 1, above, shows the percentage and number of records that reflect each type of service choice. The data in Table 1 indicate that 83.9% of telephone households nationwide (i.e., those households that have telephone service), have a wireline telephone. This statistic in and of itself is a powerful indicator of whether wireless is viewed as a substitute by most households. The fact that such a high percentage of households surveyed continue to maintain a wireline suggests that wireless service does not act as a "close substitute" for a wireline. There is no question that some substitution is taking place, both as witnessed by those households that are wireless-only, and those households that may have cut back on "additional" wirelines, but the fact that 83.9% of telephone households nationwide have decided to maintain a wireline indicates that there must be characteristics of the service that wireless cannot supply, making it difficult to substitute.

Statistical Analysis of the Choice to Go Wireless-Only

In order to examine factors that influence a household's decision to cut the cord, a regression analysis was utilized. To more narrowly focus the choice, the statistical analysis is conducted on "telephone households."[3] The dependent variable in the analysis will be a household's choice to go "wireless-only" versus the decision to continue to purchase wireline service (either alone or in combination with wireless). Because the NHIS study includes demographic and economic information regarding the household, it is possible to study the factors that influence the wireless-only choice. A list of the non-price factors that are hypothesized to influence the choice of wireless-only is discussed below. Recall that the "decision unit" is a family household, and almost all households are single family households. Each term concludes with a variable abbreviation in parentheses. This list of factors hypothesized to influence the wireless-only choice includes important economic and demographic characteristics of the household.

- Whether the household is part of a multifamily household (MULTFAM).
- The number of cell phone in the household (NUMCELL).
- The number of individuals in the household (SIZE).
- The number of individuals in the household under age 18 (UN18)
- The number of individuals in the household over the age of 65 (OV65).

3 If the analysis leaves in the households without telephone services, the results discussed below do not substantially change. However, because the choice is structured to identify those that have selected "wireless only," it does not seem reasonable to group households that have telephone service and those that do not. The total number of observations in this regression analysis is 28,123.

- Whether the adult with the highest level of education in the household is a college graduate (COLGRAD).
- The number of individuals in the household who, due to a physical, mental, or emotional problem, require assistance with routine tasks such as household chores, shopping, or getting around (CHORES).
- The number of individuals in the household that, due to a physical, mental, or emotional problem, are limited in the amount or kind of work that can be done (WORKLIM).
- The number of individuals in the household that have difficultly walking without special equipment (WALKING).
- The number of individuals in the household that have trouble remembering or otherwise suffer from periods of confusion (REMEM).
- Number of individuals in the household that received home care, within a previous two week period (HOMECARE).
- The number of individuals in the household that have used a telephone to receive health information [test results, or medical advice from a doctor or nurse] within a previous two week period (HEALTHPH).
- Whether the household is characterized by home ownership (HOME)
- Whether the household qualifies for one or more programs that are associated with poverty relief [welfare, rent subsidy, WIC, food stamps] (POVERTY).
- Whether the household is located in the Northeast (NE).
- Whether the household is located in the Midwest (MW).
- Whether the household is located in the West (WEST).
- Whether the primary household individual is male (MALE).
- Whether the primary household individual is Hispanic (HISPANIC).
- Whether the primary household individual is non-white (NONWH).
- Age in years of the primary household individual (AGE).
- Whether the household is characterized by a married couple with both spouses present (MARSP).
- The income level of the household, identified by quintile group (INCOME).

Given that the dependent variable (the household has made the wireless-only choice) is a binary choice variable, the statistical approach utilized is a Probit regression model. The results of the regression are shown in Table B-2, below on the following page.

The results indicate a statistically significant regression.[4] In addition, all but seven of the coefficients shown in Table B-2 are highly statistically significant.[5] We can interpret the coefficient signs in the following manner: a coefficient with a positive sign indicates that there is a direct relationship between the explanatory variable and the choice of wireless-only. Table B-3, on the following page, summarizes and explains the results shown in Table B-2.

4 We would reject the null hypothesis that the explanatory variables have no impact on the choice of wireless-only service.

5 For the categorical dummy variables that specify the region and income quintile, one category is left out to avoid the "dummy variable trap." The interpretation of these coefficients is as follows: for the regional coefficients, all values are negative. This indicates that the three regions shown (Northeast, Midwest, and West) each has a lower probability of the wireless-only choice than does the South. For the income explanatory variable, the lowest category is left out, and the three statistically significant income categories show a negative sign. This indicates that each of these income categories exhibits a lower probability of wireless-only service than does the lowest income quintile.

Table B-2:
Probit Analysis of Wireless-Only Choice

Variable	Coefficient	Std. Error	t-statistic	Significance Level
Constant	0.9722	0.0531	18.30	0.00**
MULTFAM	-0.0536	0.0506	-1.06	0.29
NUMCELL	0.2870	0.0119	24.18	0.00**
SIZE	-0.2244	0.0184	-12.22	0.00**
UN18	0.0594	0.0211	2.81	0.00**
OV65	-0.1187	0.0372	-3.19	0.00**
COLGRAD	-0.0223	0.0239	-0.93	0.35
CHORES	-0.1171	0.0628	-1.87	0.06†
WORKLIM	0.0516	0.0330	1.57	0.12
WALKING	-0.1290	0.0543	-2.38	0.02*
REMEM	-0.0100	0.0576	-0.17	0.86
HOMECARE	-0.2681	0.1054	-2.55	0.01**
HEALTHPH	-0.0853	0.0370	-2.31	0.02*
HOME	-0.4692	0.0252	-18.62	0.00**
POVERTY	0.0356	0.0335	1.06	0.29
NE	-0.4133	0.0325	-12.71	0.00**
MW	-0.0796	0.0283	-2.81	0.00**
WEST	-0.3167	0.0277	-11.42	0.00**
MALE	0.2022	0.0217	9.32	0.00**
HISPANIC	0.1447	0.0282	5.14	0.00**
NONWH	-0.1052	0.0258	-4.07	0.00**
AGE	-0.0293	0.0009	-31.35	0.00**
MARSP	-0.2456	0.0281	-8.73	0.00**
IN2	0.0047	0.0301	0.16	0.88
IN3	-0.1376	0.0354	-3.88	0.00**
IN4	-0.3810	0.0403	-9.47	0.00**
IN5	-0.6575	0.0486	-13.53	0.00**

Chi Square of the Regression: 6,508; Significance Level 0.00
****Significant at 1%. / *Significant at 5%. / †Significant at 10%.**

It is notable following are statistically significant factors shown to decrease the probability that a household will be wireless-only:

- Age of household head
- Race of household head
- Number of individuals over age 65.[6]
- Larger size of the household
- Home ownership
- Marriage
- Presence of individuals with health problems
- Presence of individuals with a disability
- Higher income levels

These statistically significant factors suggest that while it is the case that we observe that a portion of households have "cut the cord" and gone wireless-only, it does not follow that wireless telephony is a widely acceptable substitute for wireline local telephone service—there are numerous countervailing factors that make the ability to substitute more difficult.

6 It is notable that this variable is statistically significant even when controlling for the age of the household head. It is also possible that individuals over the age of 65 may be present in a household, but may not be the household head.

Table B-3:
Summary of Statistical Analysis of Wireless-Only Choice

Variable	Increases or Decreases Chances of Wireless Only?	Significance Level
Number of Cell Phones in the Household	Increases	0.00**
Number of Individuals in the the Household	Decreases	0.00**
Number of Individuals Under Age 18 in the Household	Increases	0.00**
Number of Individual Over Age 65 in the Household	Decreases	0.00**
The number of individuals in the household who, due to a physical, mental, or emotional problem, require assistance with routine tasks such as household chores, shopping, or getting around	Decreases	0.09†
The number of individuals in the household that have difficultly walking without special equipment	Decreases	0.02*
Number of individuals in the household that received home care, within a previous two-week period	Decreases	0.01**
The number of individuals in the household that have used a telephone to receive health information [test results, or medical advice from a doctor or nurse] within a previous twoweek period	Decreases	0.02*
Whether the household is characterized by home ownership	Decreases	0.00**
Whether the primary household individual is male	Increases	0.00**
Whether the primary household individual is Hispanic	Increases	0.00**
Whether the primary household individual is non-white	Decreases	0.00**
Age in years of the primary household individual	Decreases	0.00**
Whether the household is characterized by a married couple with both spouses present	Decreases	0.00**
The income level of the household, identified by quintile group	Decreases	0.00**

Chi Square of the Regression: 6,508; Significance Level 0.00 / **Significant at 1% / *Significant at 5% / †Significant at 10%.

Other factors are shown to have a statistically significant impact that increase the probability of wireless-only. These factors are:

- The number of cell phones in the household.
- The number of individuals under the age of 18.
- Households with a male head.
- Households with a Hispanic head.

This result is consistent with other research regarding factors that lead to households choosing to go wireless-only. Lower incomes, Hispanic origin, and youth have elsewhere been associated with "cutting the cord."[7]

Conclusion

These results indicate that there are predictable characteristics that make wireless-only a less desirable alternative for a substantial portion of the population. The statistically significant differences identified above indicate a market that is segmented by factors such as race, gender, age, health, and disability. Because of these differences, there is no reason to believe that wireless services are a close substitute for wireline services for all consumers. Thus, because of this difficultly in substitution, wireless service will not enforce pricing discipline in the wireline market, and the presence of wireless alternatives will do little to constrain ILEC service prices.

7 "Today's cord-cutters remain distinct from the average mobile user: They earn less, are more likely to be single males younger than 35, and are less well-educated." Forrester Research Report, "Cord Cutting Grows into the U.S. Mainstream, March 30, 2006. It should be noted that while it is commonly observed that college students rely on wireless telephones, from a demographic perspective, they will be tabulated as having less education than, say, a college graduate.

Appendix C:
Biographical Information

Dr. Roycroft
Biographical Information

Trevor Roycroft is an independent consultant with eighteen years of experience in the telecommunications field.

He earned the Bachelor of Arts degree in Economics with a minor in Statistics from California State University, Sacramento. The degree was awarded with honors. He also earned the Master of Arts and Doctor of Philosophy degrees in Economics from the University of California, Davis. Dr. Roycroft's Ph.D. fields of specialization were Economic Theory, Industrial Organization, Public Sector Economics, and Economic History.

Dr. Roycroft has been involved in higher education related to the telecommunications field. From 1994 to 2004, Dr. Roycroft was a professor in the J. Warren McClure School of Communication Systems Management at Ohio University. At Ohio University Dr. Roycroft was granted tenure and promoted to Associate Professor in the Spring of 2000. His primary areas of teaching responsibility were graduate and undergraduate courses covering regulatory policy, the economics of the telecommunications industry, consumer issues with telecommunications markets, and telecommunications technology. Dr. Roycroft left Ohio University to pursue consulting on a full-time basis at the end of 2004.

Dr. Roycroft has published research in refereed journals including *The Journal of Regulatory Economics, Contemporary Economic Policy,* and *Telecommunications Policy*. Dr. Roycroft has contributed chapters that have been published in book volumes related to the telecommunications field. Dr. Roycroft has provided referee service to various academic journals including: *The Journal of Regulatory Economics, Telecommunications Policy, Social Science Computer Review, Utilities Policy, Journal of Economic Studies,* and *Communications of the Association for Information Systems*.

Dr. Roycroft has provided analysis and testimony in the telecommunications field since 1991. He served as Chief Economist at the Indiana Office of Utility Consumer Counselor from 1991 to 1994. He has been independent consultant since 1994. In his role as a consultant, Dr. Roycroft has addressed a wide variety of issues in the telecommunications field including: incentive regulation plans, cost-of-service studies, cost modeling, service quality, merger review, and competition. Dr. Roycroft has filed testimony, reports, and affidavits before state regulatory commissions (including the California Public Utilities Commission), before the Federal Communications Commission, and before the Canadian Radio-Television and Telecommunications Commission. Dr. Roycroft has also provided expert services in class action lawsuits associated with the telecommunications field.

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California consumers have experienced a staggering stream of rate hikes following the California Public Utilities Commission's decision to lift price caps, with the latest increases in basic service rates estimated to cost customers over $100 million per year. "Pricing freedom" for telephone companies has turned into tyranny for consumers.