Evaluating Telecommunications Trends: Commission Responsibilities in Evolving Markets

A Policy White Paper Prepared by

Trevor R. Roycroft, Ph.D.

For the Public Counsel Section
of the
Washington State Office of Attorney General

September 5, 2007

Roycroft Consulting
Economic and Policy Analysis
www.roycroftconsulting.org
trevor@roycroftconsulting.org

Executive Summary

While price regulation has been relaxed in some markets, the responsibilities of the Commission go well beyond setting rates. Areas where the Commission can play a vital role include the following:

Universal Service. The promotion of universal telephone service continues to be a significant responsibility for the Commission. Changing market conditions will likely present new challenges in maintaining the high levels of subscription achieved in Washington State.

Network Reliability and Quality of Service. Market forces do not guarantee reasonable levels of service quality. Thus, continued monitoring of service quality is a critical area for the Commission's attention. While the public switched telecommunications network (PSTN) is evolving, it remains a key part of Washington's infrastructure, critical for emergency communications, business and economic activity, government, educational and personal communications. The core switched wireline network still provides ubiquitous service which is used by most Washington households. The introduction of wireless and Internet-based calling has expanded the scope of the PSTN. The service quality associated with those technologies spills over and affects all PSTN users.

Consumer Protection. If market forces are to deliver benefits consistent with statutory objectives, consumers need accurate and timely information regarding market alternatives. However, telecommunications service offerings are complex, and industry practices, such as long-term contracts with penalties for early termination (which are commonplace in the wireless industry, and emerging in the broadband industry), interfere with consumers' ability to exercise choice. Some areas where the Commission can play a positive role in consumer protection include, but are not limited to: the creation of a customer bill of rights; ensuring consumers have accurate information about services; truth-in-billing and advertising practices; complaint resolution; consumer education; protection and enhancement of access to emergency services; addressing unique issues affecting senior citizens and those with disabilities; and addressing issues affecting citizens with low incomes.

Monitoring. Monitoring market conditions is a critical activity. This Commission must collect sufficient information to monitor markets, and verify that market forces are performing as expected. In the event that market forces fail to take hold, or reverse course, the Commission's ability to take corrective action depends on knowledge of market conditions. While collecting data directly from service providers continues to be an effective means of gathering information, evaluation and monitoring of markets can be assisted through third-party data sources or consumer surveys. However, the limitations of third-party data sources should be carefully understood.

Competition Analysis. Changes in technology have resulted in new services, such as broadband and wireless, which are now purchased by large numbers of Washington consumers. A critical issue facing the Commission is understanding whether alternative platforms provide competition which is sufficient to deliver market outcomes for local exchange services which satisfy statutory policy goals. To develop an accurate analysis of market conditions, the Commission should apply a three-prong approach to determine whether competition or the potential for competition is or can be an effective regulator of price. This approach should include an evaluation of supply and demand conditions; an analysis of market outcomes, with a specific focus on geographic differences in market outcomes; and the evaluation of pricing practices and trends where pricing flexibility has been granted.

Competition analysis and monitoring are also essential as duopoly market conditions may be emerging in the residential bundled services marketplace, as cable providers are often the only significant alternative to ILEC services. It is not reasonable to expect that the resulting duopoly market structure will provide effective regulation of prices.

Broadband Deployment. It is essential to expand the role of state policy makers in the deployment of advanced telecommunications technologies, given atrophy at the FCC on this issue. Broadband deployment is related to the goals of this Commission, including the promotion of universal service and economic development. How broadband deployment unfolds, and how broadband pricing impacts the adoption of this technology, will have a critical impact on economic development and the welfare of citizens in Washington state.

Table of Contents

I. Introduction

The Public Counsel section of the Washington State Office of Attorney General, in light of the issues raised by the Commission's Staff in the "Telecommunications Trends in Washington State" workshop (Docket UT-051808), requested that I review materials associated with this Docket, and address issues raised by the Staff.

The Commission should be commended for undertaking an evaluation of the role that it can play in telecommunications markets going forward. Ensuring that the benefits of new technologies and emerging competition will have a positive impact on the state's citizens should be high on the Commission's list of priorities. While recent changes in Washington Statute have relaxed pricing oversight in certain areas, other long-standing and important statutory provisions remain in place and furnish an ongoing legislative foundation for the Commission's central role as the state's policy maker in telecommunications markets. The recent legislative request for a broadband inquiry suggests new endeavors on which the Commission's expertise can be applied. The discussion below identifies key areas where the Commission should expect to apply its resources, and offers suggestions regarding how those resources can be applied and cultivated.

A. Regulatory Goals in Markets where Competition is Emerging

As the Commission Staff evaluates the role of the Commission in years to come, the statutory objectives, as stated in the Policy Declaration at RCW 80.36.300 continue to provide goals which must be addressed in light of emerging competition and technological change.

> The legislature declares it is the policy of the state to:
>
> (1) Preserve affordable universal telecommunications service;
> (2) Maintain and advance the efficiency and availability of telecommunications service;
> (3) Ensure that customers pay only reasonable charges for telecommunications service;
> (4) Ensure that rates for noncompetitive telecommunications services do not subsidize the competitive ventures of regulated telecommunications companies;
> (5) Promote diversity in the supply of telecommunications services and products in telecommunications markets throughout the state; and
> (6) Permit flexible regulation of competitive telecommunications companies and services.

The legislature has provided a range of tools for the Commission to use to relax regulatory oversight when appropriate, including competitive classification and the

approval of an alternative form of regulation (AFOR) for a requesting company. However, absent a specific directive from the legislature, the Commission remains obligated to carry out the policy objectives of RCW 80.36.300 for the services over which it has jurisdiction. While it is possible that the Commission can rely on market forces to constrain market power, ensure just and reasonable rates, and otherwise satisfy these goals, it must develop and maintain the expertise and analytical tools with which to evaluate whether market forces can ensure the satisfaction of the policy objectives.

B. Price Deregulation Does Not End Commission Responsibilities

While price regulation has been relaxed in some markets, the responsibilities of the Commission go well beyond setting rates. Furthermore, as competition emerges, the Commission provides a unique resource which can ensure that benefits from market competition are forthcoming. As noted in a 2005 NRRI report:

> The advent of competition in telecommunications markets, especially in local telecommunications, has changed the way public utility commissions regulate the industry. And there are pressures to limit state commission jurisdiction or deregulate the industry. State commissions have many functions, many of which go well beyond traditional economic regulation of retail prices. Deregulation does not imply no regulation. The telecommunications network is part of the nation's essential infrastructure. Even as they give up control of most retail rates, state commissions serve critical functions such as protecting consumers, promoting universal service, ensuring adequate quality of service, enabling competitive entry and encouraging deployment of advanced technologies. Legislative proposals to deregulate competitive sectors of telecommunications may cripple commissions' ability to carry out necessary functions that protect consumers or ensure that markets remain open to sustainable competitive entry. Though some functions might be shifted to other agencies, the technical expertise, ongoing relationship with the industry and consumers, and fact finding and rule making abilities of public utility commission give them advantages in carrying out these functions.[1]

Commission involvement in the areas identified by the NRRI, and other areas, as discussed herein, continue to be of vital importance for Washington State and its citizens. While price regulation may be relaxed where this is found to be consistent with the public interest, the Commission still must contribute to the oversight of the telecommunications industry in the state, as this industry is playing an increasingly important role in the state's economy. The Sections below highlights some of the areas

---

[1] Ed Rosenberg, Ph.D. and Joe McGarvey, "Briefing Paper: What to Think About When You Think About Telecommunications Deregulation," The National Regulatory Research Institute, April 2005.

where Commission involvement is essential.

II. Affordable Universal Telephone Service

Washington State is a national leader in telephone subscription. As recently noted by Commissioner Jones:

> Over the years, state regulators have been diligent in ensuring that basic telephone service is affordable. Our state has promoted policies that encourage coverage in rural areas and provide assistance for low-income families to subscribe to services. All of this has contributed to higher telephone penetration.[2]

Continued application of policies which promote telephone subscription are desirable, and evolving markets are likely to present new challenges, and require new policy responses, so that high levels of subscription can be maintained.

According to RCW 80.36.600, "Basic telecommunications services" include the following:

(i) Single-party service;
(ii) Voice grade access to the public switched network;
(iii) Support for local usage;
(iv) Dual tone multifrequency signaling (touch-tone);
(v) Access to emergency services (911);
(vi) Access to operator services;
(vii) Access to interexchange services;
(viii) Access to directory assistance; and
(ix) Toll limitation services.

Basic telecommunications services (BTS) have traditionally been associated with the circuit-switched offerings of wireline local exchange carriers. These services play a critical public interest role associated with community safety, economic development, universal service objectives, and use of information services. In spite of rapid technological changes, BTS remains a critical telecommunications service. As will be discussed below, one recent survey shows that consumers view their wireline phone as the most important communications product in the household. This is not surprising given the functionality that BTS can provide Washingtonians, in addition to voice calling, which include:

---

[2] "Washington state leads nation in households connected to the telephone network," Washington Utilities and Transportation Commission press release, July 3, 2007.
www.wutc.wa.gov/webimage.nsf/0/99374C795B6715358825730D0079889F

- An "address" on the Public Switched Telecommunications Network (PSTN) which allows employers, schools, health-care providers, and other socially and economically-related entities to have a reliable point of contact with those who subscribe to BTS.

- The first point of contact for access to enhanced emergency services. Access to emergency services has been improved through the development of "enhanced" 911 services (E911), which automatically provides critical information to the public responders, even when the calling party is unable to convey information to emergency personnel.

- BTS allows individuals and families to have access to a variety of enhanced services, which have expanded communication capability and provided tremendous benefits to Washingtonians. A wide variety of technologies and services can be utilized or enhanced through use of BTS, including:

  - » Basic dial-up Internet access,
  - » Healthcare monitoring devices,
  - » Alarm services,
  - » Personal safety devices which might be used by the elderly or disabled,
  - » Dial-up information services,
  - » Home banking and personal finance services,
  - » Fax machines,
  - » Use of digital video recorders, and
  - » Use of satellite television services.

The ability of a communications service to provide the functionalities associated with BTS, listed above, will influence how easily consumers can substitute, and shed light on the ability of consumers to use intermodal technologies to replace switched wireline services offered by ILECs or conventional CLECs. Table 1, which appears below on the following page, places the characteristics of BTS into a side-by-side comparison with intermodal alternatives. The shaded cells identify characteristics which contribute to these intermodal technologies failing to provide alternatives which will reasonably meet the needs of many consumers, thus illustrating the continuing importance of BTS.

It is also important to note that BTS is a critical component of service for those who continue to demand à la carte purchases of telecommunications services. While carriers like to push bundled service offerings, consumers may find à la carte offerings to be preferred. In other markets which exhibit competition, market forces lead suppliers to offer both à la carte and bundled offerings (e.g., McDonald's offers a "Value Meal" bundle, as well as the ability to select items à la carte). Marketing practices which only offer bundles (or try to drive out à la carte offerings) may provide evidence of market power.

The promotion of affordable universal telephone service continues to be a significant

Table 1. Characteristics of Residential Basic Local Exchange Service and Intermodal Alternatives.

	Wireline BTS	**Cable VoIP**	**Wireless Service**	**Over-the-Top VoIP**
Local usage characteristics.	Unlimited local calling.	Typically unlimited	Measured usage plans.	Typically Unlimited.
Reliable E911 available?	Yes.	Yes.	No.	No.
Number portability available?	Yes.	Yes.	Yes.	Limited
Provided outside of bundle/allows à la carte?	Yes.	Depends on cable operator.	No.	No, unlimited local requires purchase of unlimited long distance. Broadband must be purchased.
Service established by provider?	Yes.	Yes.	Yes.	No.
Can be used for dial-up ISP access?	Yes.	Typically, yes.	No.	ISP access through broadband.
Works when electric power out?	Yes.	No. Cable provider may provide battery backup. Also does not work if broadband connection is out.	No. Cell towers may have short-term battery backup. Handsets must be charged.	No. Also does not work if broadband connection is out.
Broadband subscription required?	No.	No. However, voice service price may depend on purchase of broadband or other cable provider services.	No.	Yes.
Video subscription required?	No.	No. However, voice service price may depend on purchase of broadband or other cable provider services.	No.	Depends on cable company policies for broadband purchase.
Long-term contract required?	No.	Varies by offer.	Yes. (Prepaid plans typically more expensive.)	Varies.
Penalties for early termination of service?	No.	No.	Yes.	Yes. Following trial periods, fees may apply.

responsibility for the Commission. Changing market conditions will likely present new challenges in maintaining the high levels of subscription achieved in Washington State. For example, price deregulation of bundles may result in inappropriate disconnection of basic service for non-payment on bundles. Monitoring market outcomes, as discussed in more detail in a later section of this report, will contribute to the Commission's ability to continue its leadership role in ensuring affordable universal service.

III. Network Reliability and Quality of Service

Recent problems with service quality in the airline industry clearly show that even in an industry with multiple suppliers, service levels can decline without retribution from "market forces." It is clear that market forces do not guarantee reasonable levels of service quality. This lesson has not been lost on state regulators. For example, for services other than BTS, the New York Public Service Commission recently decided to rely on market forces to ensure just and reasonable rates. However, the New York Commission did not reach an equal level of comfort regarding service quality:

> [T]he existence of competition, even if it is effective and thriving, may not ensure reliable networks, and there is too much at risk for the people and the State to conclude otherwise. Protecting public health, safety and welfare remains essential and requires that we continue monitoring and enforcing network reliability, consistent with our responsibilities under the Public Service Law. As we move forward, we need to monitor reliability and be aware of major service outages to ensure that public health and safety continue to be protected, while promoting a competitive environment that encourages investment in New York State.[3]

Thus, the continued monitoring of service quality is a critical area for the Commission's attention. The nature of the public switched telecommunications network (PSTN) is evolving, with the core switched wireline network still providing ubiquitous service which is used by most Washington households. However, the introduction of wireless and Internet-based calling has expanded the scope of the PSTN. The service quality associated with those technologies spills over and affects all PSTN users. If a wireless caller experiences poor reception when placing a call to a wireline number, both the wireless caller *and* the wireline called party experience a poor quality transmission. Similarly, the lower grade of access to emergency services associated with wireless and

---

[3] CASE 05 C 0616 – Proceeding on Motion of the Commission to Examine Issues Related to the Transition to Intermodal Competition in the Provision of Telecommunications Services, STATEMENT OF POLICY ON FURTHER STEPS TOWARD COMPETITION IN THE INTERMODAL TELECOMMUNICATIONS MARKET AND ORDER ALLOWING RATE FILINGS (Issued and Effective April 11, 2006), pp. 89-90 (footnotes omitted).

Internet-based calling may have an adverse impact on individuals other than the subscribers to these services—if my neighbor has an emergency and cannot efficiently communicate the nature of that emergency to the appropriate public safety answering point, then there is a greater potential for a negative spillover. Additionally, performance of conventional 911 systems should also be of concern to the Commission.

The Commission should establish key priorities associated with the evaluation of service quality issues. These priorities should include the impact of intermodal technologies on service quality in the overall PSTN, the enhancement of intermodal technologies' abilities with regard to emergency services, and a continuing high level of performance of conventional 911 systems.

IV. Monitoring

Monitoring market conditions is a critical activity. Even the California Commission, which has decided to trust market forces to set all prices, has indicated its commitment to monitoring. In California, virtually all retail rates, other than basic local exchange service, are now set based on market forces (with basic rates to follow on January 1, 2009).[4] However, the California Commission also recognized that the operation of market forces needs to be observed:

> Finally, we will remain vigilant in monitoring the voice communications marketplace. We will ensure that basic residential service remains affordable and does not trend above the current highest basic residential rate in the state, no matter the technology employed to offer such service. Should we see evidence of market power abuses, we retain the authority and firm resolve to reopen this proceeding to investigate such developments promptly.[5]

The California Commission's Decision in D. 06-08-030 regarding price regulation and the need for monitoring, is similar to opinions offered by William Baumol and J. Gregory Sidak:

> Whenever competition has become sufficiently powerful to protect the legitimate interests of both consumers and related firms, the local telephone company should be granted full freedom from regulation, *subject only to surveillance by the regulatory agency to confirm that market forces are operating as expected and have not*

---

[4] For the four (4) largest ILECs in the state: AT&T, Verizon, SureWest, and Citizens.

[5] California Public Utilities Commission decision D. 06-08-030, August 24, 2006, pp. 156-157. Available at: http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/59388.PDF

eroded.[6]

The California Commission has been tracking price increases since it deregulated rates in 2006 and recently released a summary of ILEC price increases in a Proposed Decision which addresses high-cost funding issues. The Commission's monitoring activities indicate that there have been significant, often dramatic rate increases. Table 2, which appears on the following page, summarizes some of the rate increases identified by the California Commission since price regulation was abandoned.[7] As can be seen in Table 2, significant price increases have been implemented by California ILECs, perhaps indicating that the California Commission will face similar problems in deregulating telecommunications markets as it experienced in energy markets.[8]

This Commission must collect sufficient information to monitor market forces, and verify that market forces are performing as expected, thus protecting consumers and furthering the telecommunications policy goals of the state. Thus, even where relaxed regulation may be granted, the Commission is still obligated to carefully monitor market outcomes.

A. Market Dynamics Reinforce the Need for Monitoring

The need for market monitoring is clearly illustrated by a series of competitive setbacks, which have resulted in substantial industry consolidation, with the legacy AT&T and MCI merging with their largest competitors. The wireless industry has also witnessed mergers, with the following pairs of providers combining operations since 2004: Cingular and AT&T Wireless, Sprint and Nextel, and Alltel and Western Wireless. Consolidation in the wireless industry may not bode well for consumers.

The Commission has recently heard much about the competitive threat posed by independent or "over-the-top" VoIP industry.[9] However, recent events show that the

---

6 Baumol, William, and J. Gregory Sidak, *Toward Competition in Local Telephony,* MIT Press, pp. 4-5, emphasis added.

7 Data from Appendix Table 2 of *Proposed Decision of Commissioner Chong* in Rulemaking 06-06-028, August 3, 2007. Available at: http://www.cpuc.ca.gov/EFILE/PD/70974.pdf

8 See, for example, "California's Power Failure—Why the attempt to make the energy market more efficient has been a disaster," *Business Week,* January 8, 2001. http://www.businessweek.com/2001/01_02/b3714187.htm

9 See, for example, In the Matter of Qwest's Petition to be Regulated Under

(continued...)

Table 2: AT&T California and Verizon California Rate Increases.			
AT&T California	**9/1/2006 Baseline Rate**	**By July 2007**	**% Change**
Local Toll Service			
Initial min/ additional min	$0.092/$0.028	$0.12/$0.07	31% / 147%
Directory Assistance Services			
Per call charge	$0.46	$1.00	117%
Non-published listing			
Exclude from white page directories/ month	$0.14	$1.00	614%
Exclude from white page directories & calls to DA/month	$0.28	$1.25	346%
Returned Check Charge			
Per incident	$6.65	$25.00	276%
WirePro			
Monthly Rate	$2.99	$5.00	67%
Custom Calling Service6			
Service Charges (One time)	$4.75	$7.50	58%
Anonymous Call Rejection/ Month	$1.90	$4.00	111%
Call Fowarding, waiting, 3-way, etc. (each feature/Month)	$3.23	$5.00	55%
Caller ID/Month	$6.17	$9.00	46%
Verizon California	**9/1/2006 – Baseline**	**By Aug 2007**	**% Change**
Local Toll Service			
Initial min /additional min	$0.114/$0.042	$0.144/$0.086	26% / 106%
Directory Assistance Services			
Free Allowance	5	3	
Per call charge	$0.35	$0.75	114%
Call Waiting (monthly)	$3.50	$4.00	15%
Call Waiting & Cancel Call (monthly)	$4.00	$4.50	14%
Bundles/Packages			
Verizon Local Packages	$30.95 - 33.95	$32.99 - 35.95	6%
Verizon Regional (Freedom) Essential/Value	$27.00 - 32.00	$32.04 - 37.04	16 -19%

nature of this "threat" is in substantial flux. The nation's second largest over-the-top VoIP provider, SunRocket, abruptly ceased operations in July of this year.[10] The situation with Vonage, the nations' largest over-the-top VoIP provider, is tenuous.

Vonage has recently lost a patent infringement lawsuit filed by Verizon, which may have a substantial impact on its future. However, even absent this setback, Vonage's operating results have been shaky. Vonage reported in an August 2007 U.S. Securities and Exchange Commission filing monthly customer churn of 2.5%, and marketing costs of customer acquisition of $286 per customer. Thus, Vonage was spending about $17 million per month to replace customers who churn. These customer-churn costs consume the equivalent of the monthly revenues from about 615,000 Vonage customers (25% of Vonage's total customer base) on the replacement of the Vonage customers who churned each month. Whether such a business model is sustainable in the long run is questionable.[11]

At this time, the future of Vonage is not clear, but the situation appears to be highly unfavorable to Vonage. With regard to Verizon's patent infringement suit, Vonage was ordered by the court to pay Verizon $58 million in damages, with the potential for future royalty payments.[12] More damaging, however, Vonage was initially ordered by a federal judge to stop signing up new customers;[13] however, Vonage won a stay of the

---

[9](...continued)
an Alternative Form of Regulation Pursuant to RCW 80.36.135, Docket No. UT-061625. Rebuttal Testimony of David L. Teitzel, filed on behalf of Qwest Corporation, pp. 13-16.

[10] "For SunRocket Customers, Sounds of Silence," *Washington Post*, July 19, 2007.
http://www.washingtonpost.com/wp-dyn/content/article/2007/07/18/AR2007071802466.html

[11] The Vonage 10-Q form filed with the SEC on August 13, 2007 shows 2,,441,448 subscriber lines, churn rates of 2.5% per month, customer acquisition costs of $286.72 per customer, and average customer revenues of $28.38. See pages 14 and 17 of the 10-Q, available at:
http://www.sec.gov/Archives/edgar/data/1272830/000119312507180871/d10q.htm

[12] "Vonage to pay $58 million in Verizon patent case," March 9, 2007. *News.com.*
http://news.com.com/Vonage+to+pay+58+million+in+Verizon+patent+case/2100-1036_3-6165747.html

[13] "A Blow in Court Adds to Threats Facing Vonage," *Wall Street Journal,*
(continued...)

judge's order, for the duration of the appeals process.[14] On April 13, 2007, Vonage's CEO stepped down, with the *Wall Street Journal* noting as follows regarding Vonage's new (temporary) CEO Jeffrey Criton's challenges:

> Mr. Citron now must assuage investors who have seen the company's share price drop more than 80% since it went public. He announced his first moves yesterday on a conference call with investors, saying Vonage would cut costs by $30 million in the second quarter, partly through a roughly 10% cut to the company's work force of 1,800. Mr. Citron also said Vonage will scale back its marketing spending by $110 million this year because its aggressive advertising isn't having enough effect. "The results continue to be disappointing," Mr. Citron said.[15]

Notably, Vonage's most recent earnings statement reveals a smaller operating loss, but also a substantial decline in customer growth, which, given Vonage's continuing churn rates, is not favorable.[16]

In the event that market forces fail to take hold, or reverse course, the Commission has the ability to take corrective action. However, to do so in a timely fashion the flow of information from monitoring must be sufficient in content and in timeliness. The Commission should gather information directly from industry participants. If the Commission does not believe that it has the statutory authority to gather data from some sectors of the industry, it should seek that authority.

B. Other Statutory Objectives Reinforce the Need for Monitoring

To achieve the statutory objectives associated with the affordability of universal

---

[13](...continued)
April 4, 2007.
http://online.wsj.com/article/SB117587187185562221.html?mod=djemalert

[14] Vonage can keep signing up new customers, *ZDNet News*, April 24, 2007.
http://news.zdnet.com/2100-1035_22-6178783.html?tag=nl

[15] "Vonage Holdings Founder Citron Returns as CEO," *Wall Street Journal*, April 13, 2007.
http://online.wsj.com/article_print/SB117637885377767595.html

[16] "Vonage Narrows Loss; Subscriber Growth Slows," *Wall Street Journal*, August 10, 2007.
http://online.wsj.com/article/SB118666483938492933.html

telecommunications, the payment of reasonable charges for services, and the prevention of cross-subsidy of competitive services by noncompetitive services, the Commission should have, at a minimum, information regarding prices for basic residential voice services, and which firms are offering these services. In addition, it makes sense to track information relating to services which are closely related to basic service, such as vertical features and Caller ID. Many consumers do not have competitive choice for basic service, and thus also have no alternative source for these related services. Information regarding pricing practices and pricing trends, as well as consumer actions (i.e., the mix of services purchased), and consumers' perceptions of the market will contribute to information needed to achieve this goal.

In order to promote the diversity of supply, the Commission must have information on which suppliers are active in the marketplace. The Commission should be committed to vigilance and prompt investigative action regarding the potential for the abuse of market power. The ability to monitor market power requires that the Commission have some understanding of market conditions, including price trends, which also require timely and sufficient information.

C. Monitoring and Use of Third-Party Data Sources to Evaluate Market Conditions

While collecting data directly from service providers continues to be an effective means of gathering information, evaluation and monitoring of markets can be assisted through independent data sources, such as TNS Telecom's Bill Harvesting services. Major industry participants, such as AT&T and Verizon rely on TNS products, thus, the Commission's use of such a product would place information similar to that used by industry participants at the Commission's disposal.[17]

However, there may be limitations associated with third-party data. The Commission should carefully evaluate the quality of the data available from third-party sources, and understand its limitations.

Important questions that the Commission should consider when evaluating potential third-party data sources include: Does the number of survey participants in any discrete geographic area provide a sufficient sample to yield statistically reliable results for that area? If not, the usefulness of the data for the evaluation of market conditions will be doubtful in areas where the sample size is too small. Additionally, does any survey instrument used by a third-party data provider employ multiple languages, or is the third-party data provider's survey only available for households that respond to a survey written in English? Exclusion of non-English-speakers will introduce sample bias. Finally, does the approach utilized by the third-party data provider depend on the

[17] For an example of the general type of information TNS is capable of producing, see http://www.tnstelecoms.com/press-3-13-06.html

cooperation of households, such as those that depend on consumers turning over a complete set of bills? It is likely that this data gathering method will also generate some degree of sample bias.

The Commission should carefully evaluate the quality of the data available from third-party vendors. While such a source of information can offer insight into market conditions, the limitations of data from third-party sources should be understood by the Commission. Limitations that can be associated with third-party data suggest that such data should not be used in isolation.

The Commission, in addition to data directly collected from industry participants, or available from third-party vendors, could also consider the development of consumer surveys to gain information on consumer attitudes and market trends.

V. Emerging Competition Engenders an Expanded Commission Role in Consumer Protection

If market forces are to deliver benefits consistent with the statutory objectives, consumers need accurate and timely information regarding market alternatives. However, telecommunications service offerings are complex, and industry practices, such as long-term contracts with penalties for early termination (which are commonplace in the wireless industry, and emerging in the broadband industry), interfere with consumers' ability to exercise choice. Below are listed some areas where the Commission can play a positive role in consumer protection.

Customer bill of rights

The Commission should consider the development of a baseline set of consumer rights which service providers can opt into. This could result in a "seal of approval" type of consumer protection, which would allow consumers to select alternatives with more confidence.

Complaint resolution

The Commission should continue to provide assistance in the resolution of disputes which arise between consumers and service providers. Basic problems such as slamming and cramming are unlikely to be corrected by market forces. Truth-in-billing issues will continue to be relevant, especially as bills from multi-service providers become more complex. New issues are likely to arise, especially if pricing oversight is relaxed.

Consumer education

The Commission should consider expanded consumer education efforts, and could act to assist consumers with information regarding their choices in the marketplace. For example, developing a web site with information regarding service offerings, tallies of customer complaints, and/or the

pros and cons of various services or technologies. In addition, monitoring of advertising practices can contribute to the formulation of consumer education efforts.

Protection and enhancement of access to emergency services

The Commission should work to coordinate the activities of service providers and public safety agencies regarding the reliability of 911 access. If the Commission does not believe that it has sufficient authority to address emergency access issues associated with wireless and VoIP technologies, it should seek the necessary authority.

Senior/disabled citizen/fixed income issues

Seniors and disabled citizens continue to rely heavily on basic service. Basic telephone services enable voice communications which allow seniors and individuals with disabilities to "stay connected" to family and friends. Basic telephone services also provide a technology platform which enables enhanced services on which seniors and the disabled rely, such as personal safety devices, and healthcare monitoring.

Providing reasonable protection for basic rates will go a long way to addressing the needs of seniors and individuals with disabilities. However, targeted efforts directed at seniors and those with disabilities will offer increased protection for this more vulnerable portion of the population.

Low income issues

The Commission should monitor the impact of competition and new technologies on low-income consumers. For example, most studies which have examined cord cutting behavior have revealed that lower income households are more likely to cut the cord and go wireless-only.[18] These households may be experiencing a significant degradation in service quality, access to emergency services, and universal service as a mobile phone may not always be present in the household. Furthermore, mobile phones are not compatible with basic dial-up Internet access, which may impede a low-income cord cutter from gaining Internet access.

Other low-income issues the Commission should continue to monitor in

---

[18] See, for example, Stephen J. Blumberg, Ph.D. and Julian V. Luke. "Wireless Substitution: Early Release of Estimates Based on Data from the National Health Interview Survey, July - December 2006." Division of Health Interview Statistics, National Center for Health Statistics. May 2007.
http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless200705.pdf

light of emerging competition and the deployment of new technologies include the availability of community voicemail, and deceptive practices which target low-income consumers, such as prepaid wireline local service providers (a.k.a. Phonesharks).

VI. Understanding Market Trends and Making Sense of Emerging Competition

Changes in technology have resulted in new services, such as broadband and wireless, which are now purchased by large numbers of Washington consumers. A critical issue facing the Commission is understanding whether alternative platforms provide competition which is sufficient to deliver market outcomes which satisfy the statutory policy goals. However, existence of competing platforms is only part of the picture. As noted in a recent NRRI report:

> [W]hen assessing the competitiveness of the market for basic local telephone service, analysts should consider the extent to which wireless and broadband services are available and are viewed by consumers as reasonable substitutes for traditional wireline service. Failure to do so will bias competitive analyses towards concluding that incumbent wireline providers have more market power over basic local telephone service than they actually do and lead to more intervention than is necessary to achieve public interest outcomes. *Conversely, assuming that the availability of wireless and broadband services automatically makes local telephone markets fully competitive will bias competitive analyses towards concluding that incumbent wireline providers have less market power than they actually do and lead to less intervention than is necessary.*[19]

In evaluating market conditions, the Commission must apply analytical methodology to separate the "wheat" of intermodal alternatives which consumers find to be reasonable substitutes for ILEC services, including basic service, from the "chaff" of intermodal alternatives whose consumption has little or no impact on consumers' purchase of ILEC services. There is no question that there has been dramatic change in consumers' use of telecommunications technologies, however, not all of that change is relevant for the Commission to consider when contemplating whether market forces are capable of regulating prices, especially for basic service. To illustrate, consider Chart 1, which appears on the following page. Chart 1 contains information which places changes occurring in the Washington telecommunications market into perspective.[20] The "Total

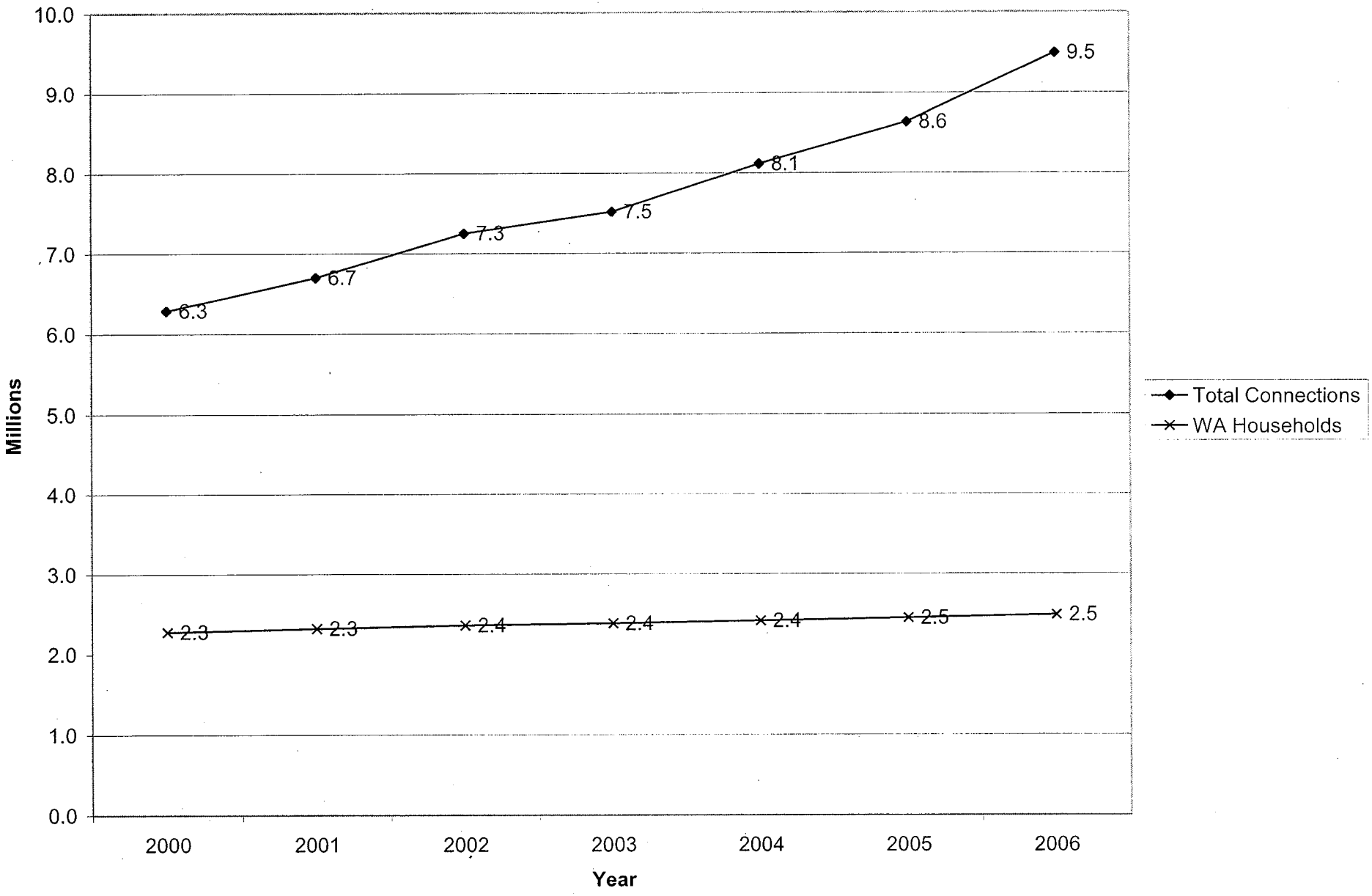
---

19 "Assessing Wireless and Broadband Substitution in Local Telephone Markets," Ed Rosenberg, NRRI, June 2007.

20 Information in Chart 1 (and other statistics presented below) is drawn from the following sources: ILEC and CLEC and wireless line counts are

(continued...)

Chart 1: Total Connections (ILEC and CLEC Switched, Mobile Wireless, and High-Speed Lines) and Washington Households



Connections" data, which is represented on the line with the "diamond" data-point markers shows the overall number of "connections" in Washington State, including ILEC and CLEC switched lines, high-speed connections, and mobile wireless connections.[21] It is clear from Chart 1 that there has been dramatic growth in the overall number of connections in the state, with the total rising by about 51% from 6.3 million to 9.5 million during the period shown. Turning to the data on the number of Washington households, which is represented on the line with the "x" data-point markers, it can be seen that while growth has occurred, the growth is modest, rising from 2.3 million households to 2.5 million households. Thus, it is clear that consumers are purchasing many more services. In 2000, the average number of connections per household was 2.4. In 2006, the average number of connections per household had grown to 3.8.

It is important to note, however, that consumers' purchase of more telecommunications services does not indicate that the services compete against one another. If they did, then the number of connections per household would not have dramatically increased. The fact that most households continue to consume switched wireline voice, wireless, and broadband indicates that large numbers of consumers view these services to be complementary, or economically unrelated.[22] The growth in the number of wireless and broadband connections does not reflect a one-to-one displacement of wireline services.

Furthermore, where displacement of switched wireline services has occurred, it may be the result of provider business plans. For example, ILECs and CLECs encourage their customers to adopt broadband DSL services. This business plan invariably has some

---

[20](...continued)
from the FCC's "Local Telephone Competition Status as of June 30, 2006." Data from Tables 9, 10 and 14 of that report. High-speed line counts are from the FCC's "High-Speed Services for Internet Access: Status as of June 30, 2006". Data on the number of households in Washington is from the Census Bureau's *American Factfinder,* for the period 2000-2005. The number of households for 2006, which is not yet available in a comparable series, is projected based on the average growth rate in the number of Washington households from 2000-2005.

[21] The Total Connections data contained in Chart 1 *does not* include data from the FCC on ILEC special access lines. These connections have grown rapidly in Washington during the period shown, increasing from about 1.4 million to 3.0 million. It is likely that there has been some substitution of business switched lines for special access lines during the 2000-2006 period.

[22] Economically unrelated goods or services have cross price elasticities which take a value of zero.

impact on the number of switched lines sold, but does not reflect competition which contributes to the effective regulation of price for switched services, including basic local exchange service. FCC data indicates that the total of ILEC, CLEC, and DSL lines sold in Washington State has declined slightly between June of 2000 and June of 2006, from 4,074,442 to 3,991,746. If most consumers found intermodal services to be substitutes for LEC services, given the 150% increase in non-LEC connections during that period, LEC lines should have dropped much more dramatically.[23] Certainly there are some households in Washington which have "cut the cord" and gone wireless only, or who use only broadband and an over-the-top VoIP provider, but this behavior is not the norm.

Consumer attitudes toward basic service continue to indicate its unique place in the overall consumption set. In spite of the rapid growth in the consumption of new technologies, a recent survey indicates that consumers still identify the wireline connection as the most important in the household, as compared to wireless services and broadband Internet access.[24]

Chart 1 provides a perspective on the analytical issue facing the Commission. Technology has changed, and consumers have expanded their consumption of telecommunications technology. The challenge facing the Commission is to accurately assess the impact new technologies on the market for switched wireline services, including basic service sold on an à la carte basis. Simply pointing to the large number of new connections in the marketplace confuses the issue, as the overwhelming majority of those new connections are not being used by consumers to substitute for wireline switched services. Rather, the new connections are being used along with wireline switched services, and for most consumers do not provide alternatives which can contribute to the effective regulation of price for basic wireline services.

A. Recommended Analytical Approach

To develop an accurate analysis of market conditions, a three-prong approach to determine whether competition or the potential for competition is or can be an effective regulator of price should be applied.

---

[23] According to the FCC data cited above, the number of wireless and non-DSL broadband connections has increased by about 150% between June 2000 and June 2006.

[24] "Wired Line Phone Considered Most Important Household Communications Product," TNS Telecoms, June 22, 2006. Available at: http://www.tnstelecoms.com/press-6-22-06.html

1. Examination of Supply and Demand Sides of the Market

The first prong of this approach is an examination of the demand and supply sides of the market. This portion of the approach evaluates whether entry barriers continue to exist and whether most consumers find alternatives that are capable of reasonably meeting their needs. Entry barriers must be carefully assessed. For example, while it may be the case that entry barriers have been overcome in the areas where cable voice services are widely sold, this impact on supply is not uniform, as cable operators generally only offer services in their franchise area. Furthermore, even where the successful entry by cable providers has been achieved, should the result be a duopoly market structure—one where the incumbent faces one rival—this market outcome is not known for delivering effective regulation of prices.

Data should be gathered on demand side behavior, and a careful examination of the ability of consumers to reasonably find price-comparable substitutes to basic service should be conducted. Evidence regarding substitution of intermodal alternatives for basic service should be undertaken, such as the number of households which have "cut the cord" or who utilize only broadband and over-the-top VoIP. To the extent feasible, consumer attitudes toward alternative technologies and the ability to substitute for basic wireline service should be assessed, perhaps through the use of carefully designed consumer surveys.

2. Evaluation of Market Outcomes

The second prong of the approach is an evaluation of market outcomes, including an examination of market concentration. In the residential market, a reasonable basis for analysis is the demand for a primary connection to the PSTN. This approach will encourage the analysis of relevant consumer choice, and provide a means of determining which alternative providers and technologies are acceptable substitutes.

To assist with this component of the analysis, the Herfindahl-Hirschman Index ("HHI") provides a useful means of comparing market outcomes in various geographic areas. Other concentration metrics can also be applied. The HHI can provide a ready means of comparing variation in geographic levels of competition. As is noted in the recent NRRI study on the assessment of competition, the HHI should be applied in a manner which recognizes the use of intermodal alternatives, but should not count all use of intermodal technologies:

> Though they must be included in calculation of measures of concentration, *simply adding the number of wireless and broadband connections to the number of wireline connections when calculating market shares and HHIs would be misleading.* Although the availability of these platforms serves to limit market power in basic wireline service, wireless and broadband services do not offer perfect substitutes

for wireline service. *Furthermore, growth in wireless and broadband do not, by themselves, provide conclusive evidence of competition with or substitutability for wireline service, since at present the great majority of households with wireless telephones also have some form of wireline connection, and most households with a broadband connection retain wireline service. For these households, at least at the access level, substitution is not occurring.*

When including wireless and broadband in market share calculations, it would be prudent to include them with weights less than one, with the particular weight based on the perceived level of substitutability. Substitutability weights could be determined from econometric results (statistical estimates of demand elasticities), if available, or from responses to consumer surveys. Also, wireless and broadband telephone service may not be attractive substitutes for Lifeline customers and others who do not already have wireless service or a broadband connection and want only a no-frills, basic service.

A general approach for including wireless providers in market share calculations would be to make a substitution adjustment and use estimates of the proportion of wireless-only households to estimate the number of wireless-only households in a geographic market and include only that number in market share calculations. Using an estimate of the number of wireless-only households in a market adjusts for the fact that, at present, most households have both wireline and wireless service.[25]

A similar approach can be used regarding substitution of independently provided VoIP services (e.g., Vonage). Estimates of the number of VoIP-only households can be determined by the use of surveys, or the evaluation of household counts, the number of primary wireline connections, and the number of wireless cord cutters.

It is likely that an evaluation of market concentration will reveal highly concentrated residential markets, by conventional standards.[26] However, relative differences in concentration values may shed light on the level of competitive activity in some

---

25 "Assessing Wireless and Broadband Substitution in Local Telephone Markets," Ed Rosenberg, NRRI, June 2007, pp. 48-49, emphasis added, footnotes omitted. Evaluating data on wireless cord cutting presents a challenge as it is easy to double-count cord cutting activity. For example, suppose that five college roommates are observed to have wireless phones, but no wireline phone. How many instances of cord cutting have occurred? Certainly, before the advent of wireless, college-roommate households most likely kept only one wireline telephone (if that).

26 For example, the Department of Justice's *Merger Guidelines* identify markets with HHI values in excess of 1,800 as "highly concentrated." http://www.usdoj.gov/atr/public/guidelines/hmg.htm

geographic areas. If area "A" yields an HHI value of 7,500, and area "B" yields an HHI value of 3,000, something very different is happening in these two areas. It may be that with adequate safeguards, regulatory oversight can be relaxed in area "B" even though the HHI indicates a continuing high level of concentration by conventional standards. However, in light of the continuing high levels of concentration, there should be substantial evidence that supply side and demand side factors are capable of contributing to the potential for the effective regulation of price (and there should be evidence that where the incumbent has been granted pricing flexibility, that market forces have constrained price increases).

3. Evaluation of Pricing Practices

The third prong of the approach is an evaluation of pricing practices for services where firms have been previously granted pricing flexibility. The evaluation of pricing practices could be based on trend analysis. For example, as discussed above, tracking price changes, such as done by the California Commission where it deregulated prices, reveals substantial price increases, which does not appear to support the proposition that market forces effectively regulate prices. Other approaches to the evaluation of pricing practices could rely on elasticity analysis, such as that adopted by the New York Public Service Commission Staff (NYPSC Staff). For example, the NYPSC Staff develops a projection of elasticity based on the following factors:

1. Growth Rate of Access Lines
2. Growth Rate of Minutes of Usage (MOU)
3. Percentage of Territory with Competitive Wireless Coverage
4. Percentage of Customers with Cable Phone Available
5. Density (Lines per Square Mile - SQMI)
6. Ratio of ILEC Residential Rate to Competitive Cable Phone Rate[27]

The NYPSC Commission Staff reached some level of comfort with regard to its elasticity modeling, and recommended, based in part on this analysis, that retail rates in New York could be deregulated. The NYPSC Staff concluded that given its assumptions about elasticity, that ILECs would not find price increases as small as 5% to be profitable.[28] However, it is important to note that carriers have been raising rates well in excess of this level, which indicates that the NYPSC Staff's elasticity assumptions

---

[27] "Framework for Regulatory Relief, State of New York Department of Public Service," White Paper Prepared by the State of New YorkDepartment of Public Service Staff, April 18, 2007, p. 14.

[28] Unnumbered page 5 of Appendix E to "Telecommunications in New York: Competition and Consumer Protection," A White Paper Prepared by the State of New York Department of Public Service Staff, September 21, 2005.

may be unrealistic.[29] For example, Verizon increased bundle prices for its popular "Freedom Packages" by $5 per month nationwide.[30] For most customers, this reflected a rate increase of between 12% and 14%. This indicates that the NYPSC Staff's elasticity estimates are overly optimistic. If a company is observed to increase rates and sustain those increases, the company must find that action profitable. The Verizon rate increases support the proposition that Verizon still has market power, even in the bundled service segment of the market.

B. Prospects for Emerging Duopoly Market Structure

Entry in the residential market, other than entry by cable telephony providers, has diminished, especially following the elimination of UNE-P. Thus, in areas with a cable provider which offers telephone services, the resulting market structure may be moving toward duopoly – two providers dominate the market. The experience in the cellular industry with regard to duopoly provision of service provides useful insight as to how reliable duopoly "competition" will be in disciplining market power.

While radiotelephone service existed since the 1950s, it was not until the early 1980s that the FCC granted the necessary licenses to enable the deployment of wireless telephony based on new cellular technology, which held the potential for expanded subscribership to wireless telephony. Initially, 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.[31] This duopoly market structure was a departure of the then-prevailing attitude at the FCC, one where local telephone service was considered to be a monopoly. While the FCC's approach to cellular licensing at least opened the potential for some degree of competition, 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

---

29 The NYPSC Staff assumed that price elasticity takes a value of -1.5 where two alternative platforms are present, and -0.5 where the customer is "captive." See, unnumbered page 5 of Appendix E to "Telecommunications in New York: Competition and Consumer Protection," A White Paper Prepared by the State of New York Department of Public Service Staff, September 21, 2005.

30 Verizon Communications Inc. Q4 2006 Earnings Call January 29, 2007 8:30 am ET, transcript available at: http://seekingalpha.com/article/25420. Verizon rates for its two most popular Freedom plans typically increased from $34.95 and $39.95 to $39.95 and $44.95 per month.

31 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.

mutual interdependence of actions, resulting in restricted output and higher prices, as compared to competitive markets.[32]

The performance of previous cellular duopoly markets 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.[33]

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.[34]

---

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

33 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.

34 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,

(continued...)

The background provided above is important when evaluating market conditions which may be emerging in the residential marketplace, as cable providers may be the only viable alternative to ILEC services. It is not reasonable to expect that the resulting duopoly market structure will provide effective regulation of prices. As a result, it is important for the Commission to monitor pricing practices in markets where it has granted some degree of pricing flexibility, and to be prepared to correct market failures which duopoly pricing may engender.

VII. Broadband and Economic Development

It is essential to expand the role of state policy makers in the deployment of advanced telecommunications technologies, and given atrophy at the FCC on this issue, there is a role for the Commission to fill. Broadband deployment is certainly related to the goals of state regulators, including some of those identified on the Stakeholder Query list, including universal service; weakness in Federal policy leadership on broadband; and the impact of broadband deployment may have on competition. Washington State (like the rest of the U.S.) is falling behind in broadband deployment, when appropriately viewed in the context of the global economy.

Absent federal leadership on the broadband issue, it is up to the states to protect the interests of their citizens and the economies which generate the standard of living which is placed in jeopardy by the failure of the current *laissez faire* approach to broadband deployment. The Washington legislature has recently charged the Commission to investigate factors preventing the widespread availability and use of broadband technologies. International statistics reveal that broadband quality in the U.S. lags many other developed nations, and also shows U.S. broadband prices at relatively high levels. The high prices charged Washington consumers for the low grade of broadband services available should be a fertile area of focus for the Washington Commission.[35] Private market forces, especially in the highly concentrated broadband access market may hinder appropriate network deployment and limit capacity. As noted recently in the *Wall Street Journal*:

> One issue causing alarm is that access providers often don't have the gear in place to provide the bandwidth they promise to DSL or cable Internet customers. They practice oversubscription in the way airlines overbook planes with the

---

[34](...continued)
released August 18, 1995.

[35] According to the most recent OECD data, U.S. average national broadband connection speeds place the nation in 14th place among OECD members. Broadband prices in the U.S. are, on a per megabit per second basis, 12.3 times higher than in Japan, and 7.4 times higher than in Korea. www.oecd.org/sti/ict/broadband

expectation some people will fail to show up.[36]

Broadband networks have characteristics similar to other basic infrastructure, such as the interstate highway system. Citizens benefit from the existence of the highway system whether or not they directly use interstate highways, or whether they are even drivers. The distribution and delivery of goods and services by way of the interstate highway system has reduced costs and improved efficiency, providing benefits to all citizens. The existence of the broadband Internet has the potential to provide similar benefits, regardless of whether consumers ever go online. Substantial economic efficiency gains and expanded economic growth have resulted from the expansion of the broadband Internet.

However, there are currently limits on the ability of users and service providers associated with the broadband Internet to reach large portions of the population. Unlike the interstate highway system, where there is universal access to and from the highway network through the widespread network of secondary roads, large portions of the population have no access, or poor-quality access, to the broadband Internet. Citizens who never directly use the interstate highway system still can directly receive services produced using that system. For example, package delivery from FexEx or UPS can reach those who don't use interstate highways. However, unlike the highway system, broadband networks have a last-mile choke point—not all households have a broadband connection. This limits the extent of benefits reaching all citizens, and also limits the potential for economic growth and efficiency improvements which the broadband Internet can provide.

The demand for the highway system arises from those citizens who directly use the system to satisfy their transportation needs, and from businesses which rely on the highway system to provide services to the public. With regard to the broadband Internet, the focus to date has been on the demand for services associated with end-users.[37] This perspective regarding broadband is highly limiting as it ignores the fundamental nature of broadband technology, which is subject to an economic "network effect." Network effects arise when the value of a product or service to society increases with the number of users. Individual users, when making their purchase decision, will focus only on the resulting benefits and costs which directly affect them. As they will ignore the impact of their decision to purchase (or not to purchase) on other individuals and businesses, private market forces will fail to deliver the socially desirable level of consumption.

---

36 "Video Surge Divides Web Watchers," *Wall Street Journal*, August 14, 2007. http://online.wsj.com/article/SB118705221439696600.html

37 See, for example, Kenneth Flamm and Anindya Chaudhuri, "An analysis of the determinants of broadband access," Telecommunications Policy, Volume 31, Issues 6-7, July-August 2007, Pages 312-326.

In addition, broadband adoption among low-income or elderly citizens may be impeded by the prices of broadband services, or the lack of computer equipment, or computer skills. Thus, it is reasonable to expect that market forces will not result in universal broadband. Absent a policy response, substantial economic benefits will not be realized.

VIII. Conclusion

Rapid technological change and emerging competition offer the potential for substantial benefits for the citizens of Washington State. However, market forces are only beginning to be tested, and whether market outcomes consistent with the statutory objectives can be achieved by market forces alone is yet unknown. This Commission has existing expertise, and the ability to cultivate expertise in areas where policy issues which affect the welfare of Washingtonians are emerging. Commission involvement in the key areas identified in this report will ensure that citizens of the State continue to enjoy the benefits of widely available and affordable telecommunications services, and have the opportunity to be full participants in the information economy which is being built on the foundation of the broadband Internet.

Summary of Dr. Roycroft's Qualifications

Trevor R. Roycroft is an independent consultant providing economic and policy analysis related to telecommunications, public utility, and information technology industries. Dr. Roycroft received the Doctor of Philosophy in Economics from the University of California, Davis. His Ph.D. fields of specialization are Economic Theory, Industrial Organization, Public Sector Economics, and Economic History.

Dr. Roycroft has sixteen years experience in the telecommunications field. This experience began with his employment at the Indiana Office of Utility Consumer Counselor ("OUCC") during the years 1991 to 1994. For most of his tenure at the OUCC he was Chief Economist. His primary areas of analytical responsibility at the OUCC related to telecommunications regulation and policy. Dr. Roycroft has also been involved in higher education related to the telecommunications field. From 1994 to 2004 he was a professor in the J. Warren McClure School of Communication Systems Management at Ohio University. At Ohio University he 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. He left Ohio University to pursue consulting on a full-time basis at the end of 2004, however, he has since served as a part-time lecturer in the Telecommunication Systems Management program in the Graduate School of Engineering at Northeastern University in Boston, MA. At Northeastern he conducted a seminar which evaluates telecommunications policymaking from a global perspective. He has published research on a variety of topics in the telecommunications field in refereed journals including *The Journal of Regulatory Economics, Contemporary Economic Policy,* and *Telecommunications Policy.* He has contributed chapters which have been published in volumes related to the telecommunications field. He has provided referee service to various academic journals including *The Journal of Regulatory Economics, Southern Economic Journal, 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 as an independent consultant in the telecommunications field since 1994. In his role as a consultant, he has addressed a wide variety of issues associated with the telecommunications field. He has filed testimony, reports, and affidavits before state regulatory commissions, before the Federal Communications Commission, and before the Canadian Radio-Television and Telecommunications Commission. He has also been retained as a witness in class action lawsuits associated with the telecommunications industry.