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Governor

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May 5, 2003

The Honorable David Goldwater
Chairman, Assembly Commerce and Labor
Nevada Assembly
401 South Carson Street
Carson City, NV 89701

RE: Senate Bill 400

Dear Chairman Goldwater:

Pursuant to your request, enclosed please find a chronology of competition in Nevada's telecommunications industry as well a glossary of relevant telecommunications terms.

I have also included a map of the service territories for all of the local phone companies (ILECs) in Nevada.

Finally, you will find four recent articles: (1) a study by Ernst & Young demonstrating the impact wireless competitors are having on the traditional need for wireline services; (2) a press release discussing the FCC's recent Triennial Report on the telecommunications industry; (3) a press release indicating that the FCC is investigating the use of power lines for broadband technology; and (4) a draft paper by the NRRI on the deployment of broadband technologies.

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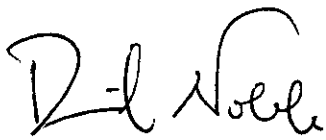
ASSEMBLY COMMERCE & LABOR 1817
DATE: 5/07/03 ROOM: 4100 EXHIBIT C
SUBMITTED BY: PUC; Soderberg, Nolde & Bolle

If you have any questions, please feel free to contact me at 775-687-6076 or at dnoble@puc.state.nv.us.

Sincerely,



David Noble
Assistant General Counsel

cc: The Honorable Barbara Buckley, Vice Chair
The Honorable Morse Arberry
The Honorable Chris Giunchigliana
The Honorable Sheila Leslie
The Honorable John Oceguera
The Honorable David Parks
The Honorable Richard Perkins
The Honorable Bob Beers
The Honorable David Brown
The Honorable Dawn Gibbons
The Honorable Josh Griffin
The Honorable Lynn Hettrick
The Honorable Ron Knecht
Chairman Donald Soderberg
Diane Thornton

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Telecommunications Glossary

ADSL *Asymmetric Digital Subscriber Line.* DSL service with a larger portion of the capacity devoted to downstream communications, less to upstream. Typically though of as a residential service.

Bandwidth The capacity of a telecommunications line to carry signals. The necessary bandwidth is the amount of spectrum required to transmit the signal without distortion or loss of information; usually measured in bits per second, kilobits per second, and megabits per second.

Bit A single unit of data, either a one or a zero. In the world of broadband, bits are used to refer to the amount of transmitted data. A kilobit is approximately 1000 bits. A megabit is approximately 1,000,000 bits.

Broadband A descriptive term for evolving digital technologies that provide consumers with integrated access to voice, high-speed data services, video-demand services, and interactive delivery services. (e.g. DSL, Cable Internet)

Business Access Line A telephone line from a business customer premise to a central office. Commonly referred to as local loop.

Cellular A mobile telecommunications system that uses a combination of radio transmission and conventional telephone switching to permit telephone communication to and from
mobile users within a specified area.

Central Office A circuit switch where the telephone lines in a geographical area come together, usually housed in a small building.

CLEC *Competitive Local Exchange Carrier*: Wireline service provider that is authorized under state and federal rules to compete with ILECs to provide local telephone service. CLECs provide telephone services in one of three ways or a combination thereof: a) by building or rebuilding telecommunications facilities of their own; b) by leasing capacity from another local telephone company (typically an ILEC) and reselling it; and c) by leasing discreet parts of the ILEC network referred to as UNEs.

Customer premise equipment Telecommunications equipment located on a customer's premises.

DSL *Digital Subscriber Line*: DSL delivers data at high speeds over ordinary copper telephone lines. DSL can carry both voice and data signals. DSL is distance-restricted, capable of providing services to customers up to 18,000 feet away.

FCC *Federal Communications Commission*: The FCC was established by the Communications Act of 1934 as a U.S. government agency independent of the executive branch and directly responsible to Congress. The FCC regulates television, radio, wire, satellite and cable in all of the 50 states and U.S. territories.

Fixed Wireless Broadband technology that uses an antenna placed on or in a building to send and receive data. The data is transmitted to and from the building via a city's wireless network, which consists of antenna towers placed three to five miles apart. If a home or building isn't in a city with wireless service, the occupants won't be able to get fixed wireless broadband. Wireless speeds are currently comparable to ADSL; however, the theoretical maximum is much higher. Wireless is also an always-on connection that doesn't tie up the phone line.

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IEC *Inter-Exchange Carrier*: Typically defined as a long-distance telephone company. IECs provide long distance services to customers between LATAs by using their own facilities or by reselling to their customers the long distance services they have purchased from another carrier.
ILEC *Incumbent Local Exchange Carrier*: The traditional wireline telephone service providers within defined geographic areas. Prior to 1996, ILECs operated as monopolies having the exclusive right and responsibility for providing local and local toll telephone service within LATAs. In Nevada, the principle ILECs are SBC and Sprint.
InterLATA Between LATAs. Telecommunications that originate in one LATA and terminate in another one. These services are often thought of as long distance services.
IntraLATA Within the boundaries of a LATA. IntraLATA services typically include local and local toll services.
kbps *Kilobits per second:* 1000 bits per second. A measure of how fast data can be transmitted.
LATA *Local Access and Transport Area:* A geographical area within which a divested RBOC is permitted to offer exchange telecommunications and exchange access services. Unless the FCC has approved its 271 application, the RBOC is precluded from carrying traffic across LATA boundaries; this traffic must be handed off to an interexchange carrier.
Local Loop A generic term for the connection between the customer's premises (home, office, etc.) and the provider's serving central office. Historically, this has been a wire connection; however, wireless options are increasingly available for local loop capacity.
Mbps *Megabits per second*: 1,000,000 bits per second. . A measure of how fast data can be transmitted.
NARUC *National Association of Regulatory Utilities Commissions*: A nationwide organization representing the collective interests of public utilities commissions.
NRRI *National Regulatory Research Institute*: The official research arm of NARUC.
POTS *Plain Old Telephone Service:* Basic telephone service, including dial tone, the ability to place and receive voice/data calls over the same basic lines.
RBOC *Regional Bell Operating Company*: A telecommunications carrier created to provide local service after the divestiture of AT&T in 1984. While there were initially seven (7) RBOCs created 1984, due to mergers there are now four (4): BellSouth, SBC, US West/Qwest, Verizon.
Resale The practice of a CLEC purchasing telecommunications services from an ILEC at wholesale rates and, then, reselling those services to the CLEC's own customers at retail rates.
Residential Access Line Telephone line from residential customer premise to central office. Commonly referred to as local loop.
Section 271 This section of TA 96 (47 U.S.C. §271) allows an RBOC to enter the long distance market after the RBOC demonstrates that it has opened its respective local markets to competition.
TA 96 *The Telecommunications Act of 1996*: TA 96 gives the FCC general rulemaking authority to set the ground rules and policies for local competition. It also assigns states the responsibility for implementing many of the statutory and federal regulatory requirements of the TA 96, either jointly with the FCC or on their own.

Tariff The documents filed by a carrier describing their services and the payments to be charged for such services.

Unbundling The term used to describe the access provided by ILECs so that CLECs can buy or lease portions of its network elements, such as interconnection loops, to serve subscribers.

UNE *Unbundled Network Elements*: Leased portions of an ILEC's network used by a CLEC to provide service to the CLEC's customers.

UNE-P *Unbundled Network Element Platform*: Refers to the combination of infrastructure elements - including unbundled loops, switches, and transport elements - that CLECs must acquire to provide local telephone service to customers. By reducing the cost and time of provisioning service, UNE-P enables CLECs to provide local service in regions normally serviced by ILECs. A CLEC utilizing a UNE-P does not have to lease space in the ILEC central office but instead leases the network elements necessary to provide service from the ILEC. The UNE-P CLEC usually leases a copper loop, a port on the ILEC switch, and a connection to the CLEC's point-of-presence.

Universal Service The financial mechanism which helps compensate telephone companies or other communications entities for providing access to telecommunications services at reasonable and affordable rates throughout the country, including rural, insular and high cost areas, and to public institutions. Companies, not consumers, are required by law to contribute to this fund. The law does not prohibit companies from passing this charge on to customers.

VoIP *Voice over Internet Protocol*: An Internet telephone call.

Wireless Telephone service transmitted via cellular, PCS, satellite, or other technologies that do not require the telephone to be connected to a land-based line.

Wireless Internet 1) Internet applications and access using mobile devices such as cell phones and palm devices. 2) Broadband Internet service provided via wireless connection, such as satellite or tower transmitters. (Also Wireless Broadband)

Wireline Service based on infrastructure on or near the ground, such as copper telephone wires or coaxial cable underground or on telephone poles.

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April 16, 2003

Wireless Substitution for Primary Wireline Service: What Is the Potential Impact? A New Study by Ernst & Young and CIT-PriMetrica

Wireline telephone companies will soon face three competitive threats to their core voice service: wireless, cable telephony, and voice over IP (VoIP). To assess the potential impact of the first of these technologies, wireless telephony, Ernst & Young together with CIT-PriMetrica have undertaken a unique study. The issue addressed by the study is not whether second and third wirelines are being replaced by wireless service or whether wireless service is impacting wireline long distance volumes. Rather, the study addresses the more far-reaching issue of the potential replacement of the primary wireline in the home.

In other words, are US households willing to go entirely wireless -- and at what price?

Our findings suggest that the threat posed by wireless service to wireline telephone companies is potentially staggering.

A nationally representative survey of 700 US households was conducted during the first quarter of 2003. The survey inquired about households' attitudes towards their wireline service provider, their experience with wireless service, and their willingness to drop their wireline service for a household wireless service plan. Detailed information was obtained on the price at which households would be willing to make this switch.

Preliminary findings from the study indicate:

- Close to one-half of households would drop their wireline service for a family share wireless plan with 600 shared base minutes offered at $50 per month.
- Roughly one-third of US households would drop their wireline service for a family share wireless plan with 2000 shared base minutes offered at $130 per month.
- Not surprisingly, households which currently have wireless service expressed a greater willingness to drop their wireline service than households which do not have any wireless service.

Complete study results will be available in late April 2003.

For further information contact Mark Nelson, (858) 350-3960 x109, mnelson@primetrica.com or Richard Sewell, (206) 654-7549, richard.sewell@ey.com

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CIT-PriMetrica

CIT-PriMetrica is a leading provider of customized solutions to the telecommunications, technology, financial, and utilities industries, with over 450 clients in 30 countries. Since 1988, the company's focus has been on accelerating profitability for businesses being impacted by the convergence of communications, media, and information technology. Our differentiated approach combines unique business and end-user content, proprietary analytics, world-class consulting expertise, and customized delivery solutions. CIT-PriMetrica's in-depth databases are constantly updated to provide timely, relevant, and immediately useful information on over 5,000 telecom and media players in 90 world markets. Our main offices are in London and Exeter, UK; San Diego, CA; and Tokyo, Japan.

BROADBAND CONNECTIONS

State commissions face gritty issues in the digital revolution. The Telecommunications Act of 1996 calls for the FCC and state commissions to encourage deployment of advanced telecommunications capability to all Americans by removing regulatory barriers to infrastructure investment and promoting competition.[1] Policy is shaped by those goals. An earlier chapter of this review discussed two tough issues faced by regulatory commissions in 2000? conflict over sharing data lines with competitors and the reciprocity of compensation for lopsided Internet traffic. In Congress, in 2000 and on into 2001 bills intended to promote broadband through various means, deregulatory and otherwise, made headway.

Policy is also informed by the facts of deployment of advanced capability, insofar as they can be ascertained and evaluated. At regular intervals, the FCC must assess the progress of broadband deployment and its adequacy. This chapter looks at the

VIVIAN WITKIND-DAVIS *is Associate Director for Research. She is currently conducting research on state efforts to encourage deployment of advanced telecommunications capabilities.*

Dr. Witkind-Davis has led projects and authored or co-authored research reports at the NRRI in the areas of "best practices" in implementation of the Telecommunications Act of 1996, mediation and arbitration of interconnection agreements, and service quality.

She received her Ph.D. in Public Policy and Management from the Ohio State University.

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FCC's August 2000 report and other sources and offers observations on some baseline questions: (1) How fast is deployment of broadband capability happening? (2) How big is the digital divide (or divides)?[2] (3) What factors other than government action (or refraining from action) are driving deployment?

Even if the answers to these questions were clear, which of course they are not, commissions will analyze alternatives carefully before coming to conclusions on the right way to proceed. They need to ask: (4) How important is the digital divide in their state and nationally? and (5) What is the proper role of government? If the divide is large, likely to be enduring and perceived as important, the FCC and some commissions might wish to push harder on deregulation and use measures to actively promote deployment as well. This chapter focuses on getting a picture of deployment and a few bellwethers of the future, not on questions (4) and (5)? how important deployment is or what actions are called for.

Is Deployment Fast Enough?

The FCC must determine whether deployment of advanced telecommunications capability is "reasonable and timely."[3] In its second report on advanced telecommunications in August 2000 (referred to herein as "the FCC report") the FCC found that deployment is going well enough so far, although some consumers are "vulnerable" to lack of access to advanced services.[4] Their conclusion is fair enough for its purpose, deciding whether heroic measures are needed. But reasonable people may disagree on just how reasonable and timely the spread of advanced services is. For one thing, a comparison of diffusion rates for broadband telecommunications and other telecommunications innovations is not likely to leave every policy maker happy. For another, the overall picture of digital deployment may be rosy, but some groups are lagging behind, as the FCC also concluded.

Reasonable people may disagree on just how reasonable and timely the spread of advanced services is.

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Noting that "broadband" is a fuzzy term, the Commission avoided using it in its report. The FCC defined "advanced telecommunications capability" as infrastructure that can deliver a speed of 200 kilobits per second in each direction.[5] This is faster than Integrated Service Digital Network (ISDN) and fast enough for popular applications, said the Commission. At 200 Kbps a user can change web pages at the speed she can flip through a book. A "high-speed" service is defined as faster than 200 Kbps, so advanced capability, or advanced service, is a sub-set of high-speed capability. The definitions are expected to evolve over time.

To make a judgment on the reasonableness and timeliness of deployment, the FCC looked at trends in subscription rates, the emergence of competition, the build-out of infrastructure, and the level of investment in advanced capabilities. The Commission found that the penetration rate for advanced services went from 0.3 percent in 1998 to 1.0 percent in 1999. Of the one million residential or small business subscribers to advanced services at the end of 1999, about 875,000 used cable modems, about 115,000 asymmetric digital subscriber lines (ADSL), and the balance other media like satellite, land-based wireless or electric lines. Cable companies tripled their subscribers from 1998 and DSL subscribers for the telephone companies quadrupled. Cable's overall market share declined, although cable is still in the lead. Figure 1 shows residential market shares for advanced services in 1998 and 1999.

The FCC found that infrastructure to support advanced services is being rapidly built. Backbone capacity is being supplied by nationwide wireline providers, more local transport providers, terrestrial wireless, and satellite-based wireless.[6] "Middle-mile facilities," which the FCC defines as those going from the backbone providers to the "last mile" that connects directly to customers, are also rapidly being constructed. Since 1995, fiber miles deployed in the U.S. have doubled, reflecting huge investments in middle-mile facilities.[7] Advanced capability in the "last mile,"

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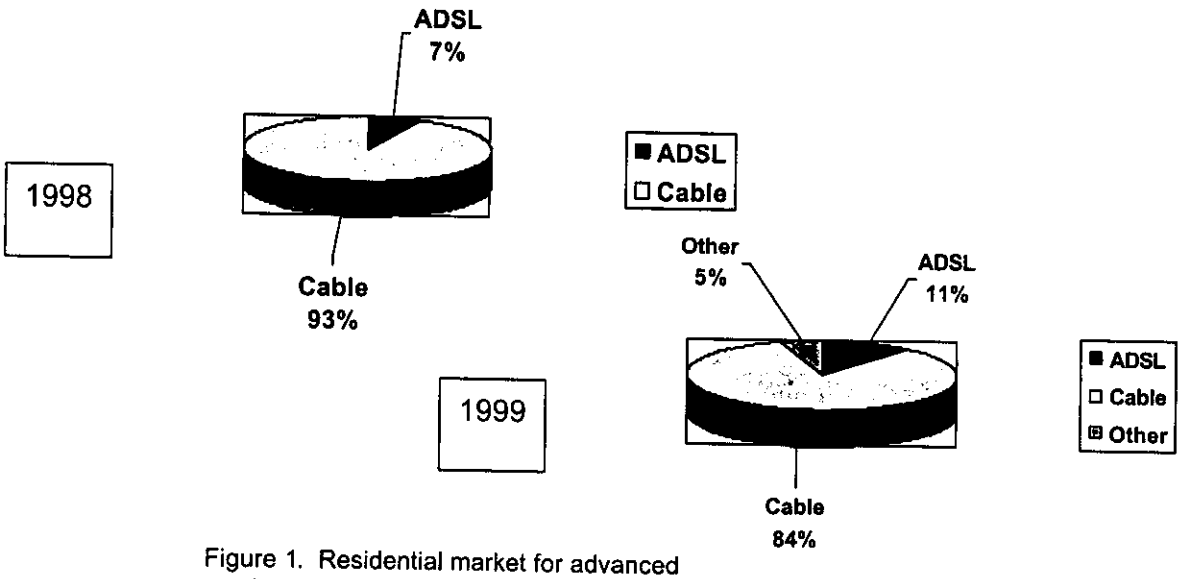

Figure 1. Residential market for advanced services, 1998 and 1999.

Source: FCC.

which connects middle-mile facilities and the last 100 feet that go to a user's terminal (the driveway in the FCC's highway system analogy) is expanding rapidly, as suggested by the increases in subscribership.[8]

The FCC report concludes, based on its own broadband survey and comments submitted to it, that "advanced telecommunications capability is available now and continues to be deployed to significant numbers of residential customers in communities of all types."[9] Existing providers show no sign of letting up on deployment and there is a "real prospect" of deployment of wireless technologies that can overcome some of the technical limits of cable and telephone plant and reach some of the most rural communities.[10]

One way of looking at the speed of broadband deployment is to compare its rate of diffusion with other communications technologies. The FCC provides some interesting comparisons of penetration levels of such technologies early in their history.[11] Diffusion of advanced telecommunications capability is ahead of some technologies, like telephone, after the same time period, but behind others, like radio. Such comparisons are not necessarily illuminating, since many factors are at work. But it is

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worth noting that diffusion of an innovation based on network technology to most of the population ordinarily takes place over decades, not just a few years. Adoption rates for telephony and radio are shown in Figure 2. Data for the early years of the author of the study, thus the stories for telephone and radio start at the same time, in 1920, with adoption of telephony at 35 percent and radio at 1.6 percent (or a little ahead of the 1999 adoption level for advanced telecommunications capability, as noted by the FCC).[12] Diffusion of telephony did not take off until the 1940s, after which it followed a fairly steep slope for four decades, until it leveled off at about the current level of 94 percent. (See the telecommunications chapter of this report for more discussion of universal service penetration rates.)

One way of looking at the speed of broadband deployment is to compare its rate of diffusion with other communications technologies.

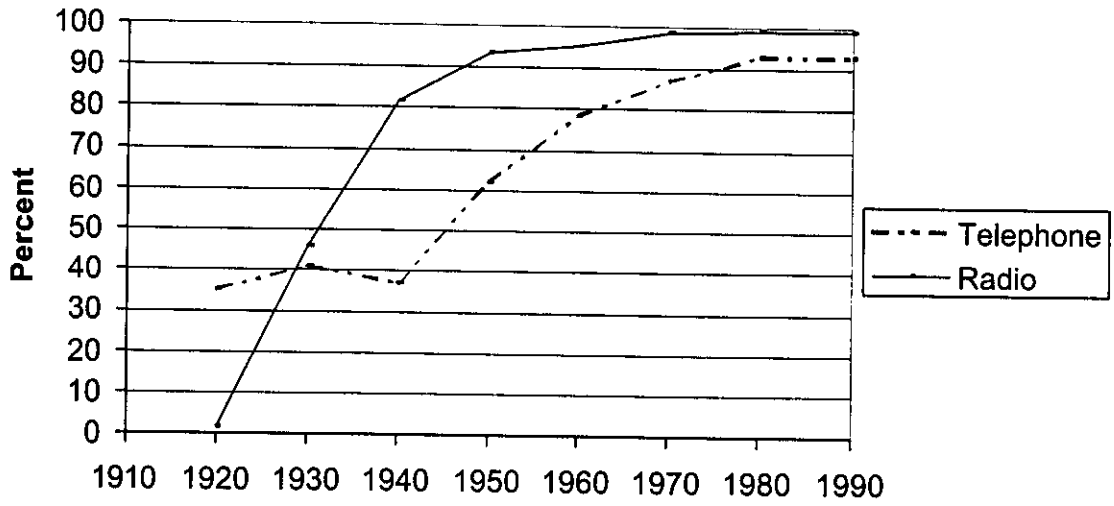

Figure 2. Adoption Rates for Telephone and Radio

Source: Annual Review of Institute for Information Studies - 1991.

C 12 of 17

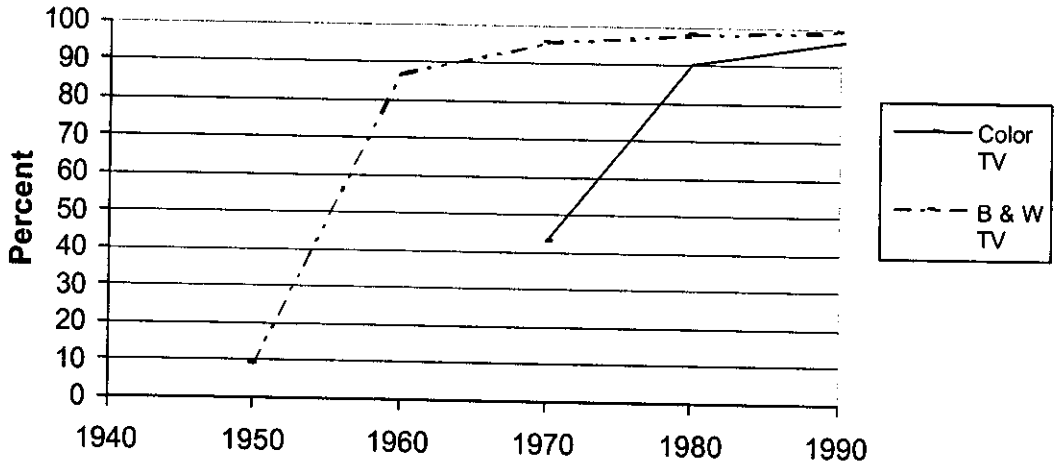

Figure 3. Adoption rates for black and white TV and color TV.

Source: Annual Review of Institute for Information Studies-1991.

The telephone is probably not an apt comparison to advanced tele-communications capability because it required the initial installation of expensive wiring and switches nationwide to enable access. Both cable modems and DSL are add-ons to existing wired networks. Perhaps radio is a more appropriate comparison. The graph shows that it took thirty years, from 1920 to 1950, to reach 90 percent of the population and it was not until fifty years had passed that it reached 99 percent. It is thus at least interesting that the FCC finds diffusion of advanced capabilities to be behind radio after the same length of time for the earliest period of diffusion.

Radio may not be an apt comparison either. Even though radio is wireless, investments and customers started from ground zero, with no initial infrastructure to build on and little customer awareness or experience with the appeal of broadcast information and entertainment. Figure 3 gives some other comparisons, in this case adoption rates for a pair of innovations building on each other? black-and-white television and color TV. Black-and-white television was an immediate hit with consumers after World War II, with an adoption level of 8.9 percent in 1950 that shot to 86.6 percent in 1960, and then grew more slowly until it reached 99 percent of the population. Color TV never

climbed quite as steep a slope, but nonetheless went to 43 percent between 1960 and 1970, rose to 90 percent by 1980 and was at 96 percent in 1990. If diffusion of advanced telecommmunications capability followed a similar path, it would be used by well over half the population in ten years and take two decades or more to reach the current level of telephone penetration.

If diffusion of advanced telecommmunications capability followed a similar path, it would be used by well over half the population in ten years and take two decades or more to reach the current level of telephone penetration.

Some policy makers will conclude that a couple of decades is quite fast enough and that government intervention is not required to accelerate deployment. Others will disagree with the FCC conclusion that the spread of advanced telecommunications over decades is timely, especially since many households may be at the far end of the adoption cycle, as discussed in the next section.

Endnotes

[1] 47 U.S.C. Section 706(a).

[2] Commissioner Brett Perlman of the Texas Public Utility Commission notes that there are many digital divides, not a single fault line, meaning that numerous factors, demographic and otherwise, are associated with whether availability of broadband is high or low.

[3] 47 U.S.C. Section 706(b).

[4] FCC, Second Report, Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, CC Docket 98-146, Aug. 21, 2000.

[5] FCC, Second Report, §11.

[6] FCC, Second Report, §21.

[7] FCC, Second Report, § 26.

[8] FCC, Second Report, § 28.

[9] FCC, Second Report, § 217.

[10] Ibid.

[11] FCC, Second Report, § 219.

[12] Susan G. Hadden, "Technologies of Universal Service," *Universal Telephone Service: Ready for the 21st Century?* (Queenstown, MD: Aspen Institute, Institute for Information Studies, 1991), www.aspeninst.org

C 15817

Vivian Witkind-Davis
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ADDITIONAL: Resume

Vivian Witkind-Davis is Associate Director for Research at the National Regulatory Research Institute. She is providing staff support for the Federal-State Joint Conference on Advanced Services through the FCC interactive survey on deployment of broadband services available on the NRRI website. Dr. Witkind Davis has conducted numerous tutorials for new public utility commissioners covering universal service and other topics. She has led projects and authored or co-authored research reports at the NRRI in the areas of "best practices" in implementation of the Telecommunications Act of 1996, mediation and arbitration of interconnection agreements, and service quality. Her most recent research report is A Critical Perspective on a Telecommunications Bill of Rights.

Dr. Witkind Davis has served at the NRRI as Associate Director for Telecommunications and Water, and in other capacities. She has been a writer for Congressional Quarterly in Washington, D.C., and taught public policy at Florida Atlantic University. She has been a member of NRRI teams providing technical assistance to many states and training for the governments of Bolivia and Egypt. She holds a B.A. with college honors from Wellesley College in political science, an M.A. in international relations from the Fletcher School of Law and Diplomacy (Tufts University), and a Ph.D. in public policy and management from the Ohio State University.

PROJECTS

- Broadband Connections - draft
- Convergence and Advanced Telecommunications Capabilities
- Why Not a Telecommunications Bill of Rights?
- Universal Service in Telecommunications
- FCC/NRRI Survey on Community Broadband Deployment | Review Results

REPORTS & PAPERS

- A Critical Perspective on a Telecommunications Bill of Rights
- Telecommunications Service Quality

PRESENTATIONS

- Geographic Deaveraging
- Telecommunications Regulation in 2000

SURVEYS, TABLES, CHARTS, AND GRAPHS

C 16917

Charles Bolle

From: <WashingtonWatch@neca.org>
To: <cbolle@puc.state.nv.us>
Sent: Tuesday, April 29, 2003 10:56 AM
Subject: Washington Watch 04/29

BROADBAND REGULATION
Notice of Inquiry, ET Docket No. 03-104, FCC 03-100
4/28/03 - The Commission is initiating an inquiry to obtain information on a variety of issues related to Broadband over Power Lines (BPL) systems. BPL systems are a new type of carrier current system that operates on an unlicensed basis under Part 15 of the Commission's rules. Through this inquiry the Commission is seeking information and technical data so that it may evaluate the current state of BPL technology and determine whether changes to Part 15 of the Commission's rules are necessary to facilitate the deployment of this technology. **Comments are due 45 days from publication in the Federal Register. Reply Comments are due 75 days from publication in the Federal Register.**

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