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COMPETITION IN THE COMMUNICATIONS MARKETPLACE: HOW CONVERGENCE IS BLURRING THE LINES BETWEEN VOICE, VIDEO, AND DATA SERVICES

HEARING

BEFORE THE

SUBCOMMITTEE ON TELECOMMUNICATIONS AND THE INTERNET

OF THE

COMMITTEE ON ENERGY AND COMMERCE

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COMPETITION IN THE COMMUNICATIONS MARKETPLACE: HOW CONVERGENCE IS BLURRING THE LINES BETWEEN VOICE, VIDEO, AND DATA SERVICES

WEDNESDAY, MAY 19, 2004

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ENERGY AND COMMERCE,
SUBCOMMITTEE ON TELECOMMUNICATIONS
AND THE INTERNET,
Washington, DC.

The subcommittee met, pursuant to notice, at 11 a.m., in room 2123, Rayburn House Office Building, Hon. Fred Upton (chairman) presiding.

Members present: Representatives Upton, Stearns, Gillmor, Cox, Deal, Whitfield, Shimkus, Pickering, Buyer, Bass, Walden, Terry, Barton (ex officio), Markey, Wynn, Davis, and Gonzalez.

Staff present: Howard Waltzman, majority counsel; Neil Fried, majority counsel; Will Nordwind, majority counsel and policy coordinator; William Carty, legislative clerk; Peter Filon, minority counsel; and Voncille Hines, minority professional staff.

Mr. UPTON. Good afternoon, everyone. I know we have a number of subcommittee meetings this morning and the House is in session and we expect votes about 1 I am told. Good morning. Today's hearing is entitled "Competition in the Communications Marketplace: How Convergence is Blurring the Lines Between Video, Voice, and Data Services."

This is another in a series of hearings that the subcommittee will be holding this year regarding competition in the communications marketplace. These hearings are designed to lay a foundation for us as we prepare to revisit the Telecommunications Act of 1996 in the next Congress.

Today's hearing is a rather unique approach in that we are focusing solely on technology, not policy. Today's witnesses are not policy people. They are technologists who will demonstrate through their company's gadgets how the marketplace is evolving to one where voice, video, and data services are converging and blurring the lines between those services.

Subsequent hearings will have a policy discussion about how this convergence, this blurring of the lines should impact our regulatory approach to the marketplace. I, for one, have made no secret of my belief that the legacy stovepipe regulation perpetuated by the Telecommunications Act of 1996 needs to be revisited given the evolution and technology in the marketplace that was virtually unfore-

seen at the time that the Act was written. The technology that will be demonstrated today will provide us a few examples of this incredible innovation, evolution, and convergence about which I speak.

I want to thank all of our witnesses for their extra efforts in making sure in advance that their demonstrations would work in our hearing room today. I might note that my mom was a teacher so I know how important that is. I also want to especially thank our committee's information technology director John Clocker who assisted our witnesses with the setting up of their demonstrations. As usual, John has made all of the terrific technology in this room not only work, but also look so effortless to use.

At this point I yield for an opening statement from my colleague from Maryland, Mr. Wynn.

Mr. WYNN. Thank you, Mr. Chairman. I really appreciate the fact that you are having this show and tell hearing. I think it is going to be very exciting. I am looking forward to seeing the presentations and learning about the new technology.

With respect to the Telecomm Bill I would only say it is interesting that just about the time we figure out what we put in and how it actually affected the industry, we find it is time to revisit it again. I think it really reflects the fact that generally technology out-paces policy so we are going to have to really scramble to keep up, but also be mindful of the fact that there are limits to what we can do as policymakers in this new frontier of high technology.

I relinquish the balance of my time. Thank you for calling the hearing, Mr. Chairman.

Mr. UPTON. Mr. Cox.

Mr. COX. Thank you, Mr. Chairman. I am looking very much forward to the presentations that we are going to have today. I want to thank you for holding this important hearing on the explosion of new Internet-based services available to consumers.

Given the pace of technological change, it is important to have an almost daily reality check to ensure that we understand the products, the markets, the consumers, and the producers who have to live under the laws that we write. With all the options for consumers today and all the competing platforms, that are now able to offer video and voice and everything else that can be converted into digital data, we might wonder whether our laws can possibly keep up.

Seven years ago Peter Huber published a book arguing that it was time to shut down the FCC and let common law and the courts settle any disputes that arise in this rapidly changing high-tech market, because anything else would fall short.

Given that the premise of our legislation and regulation over the last century is to regulate communications based on our apparent scarcity of communications, today's hearing gives us an opportunity to step back and ponder the big questions: whether we still need the kinds of regulators that we presuppose when cable companies, phone companies, wireless companies, even satellite companies are all competing to offer a package of digital services.

This seems to be the competition we have all sought for a long time and so perhaps we should declare a victory, perhaps even en-

visioning the Peter Huber future in which we shut down the FCC and schedule a long district work period.

As we look at all the products to be demonstrated today, all of them enabled by the Internet and driven by advances in computer hardware and software markets, it is useful to remember that these largely unregulated markets have a history of innovation that the highly regulated telephone market cannot match. I think it is not because of the lack of innovative creativity in telephony, but rather the difference in the regulatory environment.

We should be chary about bringing 1930's telephone regulations into these high-tech industries and we should be seeking ways to liberate telephony from the heavy regulation that began so long ago in the age of analog scarcity and dominant carriers.

There is much talk in Washington now of Congress gearing up for a rewrite of America's communications law. But possibly what we will learn today is that retirement would be a better option. I thank the Chairman again for holding this important hearing.

Mr. UPTON. Mr. Gonzalez.

Mr. GONZALEZ. Waive opening.

Mr. UPTON. Mr. Walden.

Mr. WALDEN. Thank you, Mr. Chairman. I am just looking forward to the presentations.

Mr. UPTON. Mr. Pickering.

Mr. PICKERING. Mr. Chairman, I thank you for having this hearing. I am looking forward to hearing the testimony of the panel. We do have many exciting new technologies and innovations as we move forward on applications like Voice-over-Internet.

As you all know, I have recently introduced legislation that would free that from any threat of regulation protected from taxation and create mechanisms as it applies to other issues from social responsibilities to compensation and universal service. Those are all issues that are important as we look at telecomm policy in the future.

Mr. Chairman, I look forward to hearing what we can do for this committee to incent new innovation, deployment, competition, and convergence. I hope to work with those in the technology and telecommunications sectors as we go forward on this committee. Thank you very much.

Mr. UPTON. Mr. Terry.

Mr. TERRY. Waive.

Mr. UPTON. Mr. Bass.

Mr. BASS. Thank you, Mr. Chairman. I see this as the opening act in a very complicated and long play which will extend through hopefully 2004 as we examine the whole Telecommunications Act. There are, as my friend from Mississippi said, many different and somewhat thorny controversial issues that we will be bringing up including Voice-Over-Internet protocol, satellite radio, perhaps another look at satellite, television, and so on, digital conversion. I mean, a whole menu of things.

The underlying and most important issue behind all of this debate is not who wins or who loses. The winner has to be the consumer. The winner has to be the U.S. economy and the United States must maintain its prominence in telecommunications development and utilization.

I look forward to this hearing as a beginning and an interesting, if not complex, debate on how we proceed next year. Yield back.

Mr. UPTON. Mr. Stearns.

Mr. STEARNS. Good morning and thank you, Mr. Chairman, for holding this hearing. As we begin to re-examine the Telecomm Act of 1996 and the Communication Act as a whole, it is vital that we get a hand on how these new technologies are reshaping the telecomm markets and affect a consumer demand.

Before us today we have a number of highly innovative technologies which demonstrate that the elusive convergence of telecomm service is now apparently within the market's reach. What we will see today is how a voice data network based on Internet protocol can revolutionize business and residential services.

Voice-over-Internet protocol, or VoIP, has dominated the news over the past 6 months. It is a tremendous advancement in voice communication, and is an example of the tremendous potential of these nascent telecomm technologies. Broad band over power lines is another incredible technology that uses the existing electric power grids to deliver high- speed services.

The telecomm sector as a whole has suffered over the years, yet technologies, especially broad band technologies, are on the verge of serious growth. With these technologies there is a reasonable expectation that the market can be saturated with numerous offerings of broad band services regardless of the provider. The provider could be your phone, your cable, your wireless, or your current electric company.

One criticism of the broad band market in America has been the lack of application that significantly drives consumer demand or so-called killer app. I think that with advances in offering broad band, the consumers are always connected meaning they have the ability to access information and entertainment whenever and wherever they choose.

Consumers are increasingly becoming reliance on instant gratification. If our desires can be satisfied in the least amount of time with the least amount of effort, well, so much the better. The technologies we are seeing today have one thing in common, Internet protocol addressing, the underlying system that runs the Internet.

By offering voice and data to consumers using Internet protocol addressing, we are seeing what I would term as an advanced Internet communication service. Instead of a killer app, then we have a killer service, one that can provide all the communication, information, entertainment applications with less effort on the side of the consumer. VoIP is a tremendous marketing challenging application but it is just that at this point, an application.

As we move forward in debating changes to the Telecomm Act, we should be mindful that we examine the provisions of services, not each individual application. I applaud you on this hearing, Mr. Chairman, and I look forward to the testimony.

Mr. UPTON. Mr. Deal.

Ms. DEAL. Waive.

Mr. UPTON. Well, that concludes the opening statements. We welcome the panel that is here today. Normally we allow—I will advise and extend my remarks. We have not quite completed our

opening statements and I yield for an opening statement by my friend and ranking member of the subcommittee, Mr. Markey.

Mr. MARKEY. Thank you Mr. Chairman, very much. I apologize to you and to our excellent panel here today. This hearing, Mr. Chairman, is about the future. It showcases technologies and products and services that may become an everyday reality for millions of Americans in the coming months and years.

The inexorable march of digital technologies and the continuing development of Internet based communications technologies allow for a flowering of technological appliances and services that represent a cross-pollination of hitherto distinct applications.

Yet, as much as this hearing on communications convergence is about the future, it is also about the past. By creating an environment where such technologies could flourish, the subcommittee is in essence the convergence committee of the Congress.

From our work in the 1996 Telecommunications Act in insuring that incumbent telephone and cable companies were prohibited from buying each other out, we made sure that there were at least two wires independently competing for residential services. By preempting the 26 states which in 1996 prohibited a cable company, electric company, municipality, or entrepreneur from offering a competing telecommunications service, we created the prospect of a national marketplace for telecommunications services.

By visciating all exclusive franchise agreements in the 1992 Cable Act, we permitted competing cable companies to enter the residential video marketplace paving the way for cable, broadband companies to serve consumer demands such as Starpower and RCN.

By staring down the FCC in the late 1980's when it wanted to impose per-minute access charges on enhanced services, this subcommittee ensured that Internet service providers could offer flat rate access and that nascent Internet-based services weren't saddled with onerous per-minute fees.

By shifting over 200 megahertz of spectrum to the FCC in 1993 and then insisting that major licenses could not be auctioned in region to the incumbent cellular duopoly, this subcommittee fostered an explosion of digital wireless growth. I continue to believe, Mr. Chairman, that the model we chose for the wireless industry is a good lesson.

In other words, by insisting on competition through the sheer ability of the FCC to create competition through effective licensing rules which prohibited the incumbents from simply gobbling up the new frequencies, we were able to create a third, a fourth, a fifth, and more wireless competitors in each market. Although the incumbent cellular duopoly vigorously opposed our efforts, Congress and the FCC stuck to their guns in creating a more competitive wireless market.

Because we did, sufficient competition developed to protect consumer interest and we were able to subsequently deregulate the wireless market to a very large degree. Millions of Americans, consumers, workers, and entrepreneurs have benefited from this policy and the emergence of additional digital wireless technologies and ever lower consumer prices is testimony to this success story. I still

believe that insisting upon competition to the incumbents was the right thing to do.

The point is that regardless of how ingenious a new whiz bang device might be in our telecommunications marketplace, its creators need governmental policies which allow it to reach the market. Otherwise, it will remain merely a gleam in the eye of an engineer in a laboratory. Moreover, the marketplace needs sufficient competition to ensure the participants continue to innovate, the innovators have a sufficient number of companies to whom they can sell their products and services, and that consumers see higher quality offerings and lower prices.

We are fortunate that by in large over the years we have made a series of policy decisions that have worked. We obviously have more work to do in some areas and I look forward to working with all the subcommittee members on those issues in the future. I applaud the all-start class of witnesses for taking time out of their busy schedules to give us a sense of what they are currently working on and I look forward to their testimony. I yield back the balance of my time.

[Additional statements submitted for the record follow:]

PREPARED STATEMENT OF HON. BARBARA CUBIN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WYOMING

Thank you, Mr. Chairman.

I look forward to our hearing today on the on the convergence of a multitude of communications technologies. Clearly, we have come a long way from the Telecommunications Act of 1996. I'm not certain any of us at that time could fully envision how the Act would change the communications landscape. Now, we can actually touch the new technologies, visualize how they will fit into our lives, and choose what platform on which we receive voice communications, data services and video content.

Wireless, fiber to the premises, cable, satellite, and power lines are these platforms, and we need to ensure that the law treats them fairly and also encourages companies to build these technologies out—even to our most remote constituents. Unfortunately, there are many in rural America do not have the choice that others have with regard to how they receive voice, video and data content, if they can even get broadband services at all. That's why we must continue lowering barriers to these important services and streamline access to rights of way and a capital. The president's recent Executive Order is a good start, but these still a ways to go before we achieve platform neutrality and comprehensive consumer choice.

I look forward to hearing from our distinguished panel on these matters today and want to continue our dialog as we tackle legislation affecting these services.

I yield back the balance of my time.

PREPARED STATEMENT OF HON. JOE BARTON, CHAIRMAN, COMMITTEE ON ENERGY AND COMMERCE

Mr. Chairman, thank you for calling this hearing today. I am delighted that Members of the subcommittee will have this opportunity to view firsthand the products that are driving the convergence of voice, video, and data services.

The competition that was envisioned by the Telecommunications Act of 1996 is finally taking shape. And that competition is coming from companies using different technology platforms and networks to provide consumers with the same suite of services.

Cable companies, in addition to leading the broadband market, are beginning to offer both circuit-switched and Internet Protocol-based phone service. Wireless companies are offering high-speed data and video services on mobile phones. Telephone companies are putting fiber in their networks so that they can offer video services. For example, I understand that Verizon is planning to build a fiber-optic network in Keller, Texas over which Verizon will offer voice, video, and data services. Electricity companies are using the grid to offer Internet Protocol-based voice, video, and

data services. And Voice-Over-Internet-Protocol companies are using all of these platforms to offer consumers new services.

The devices showcased today will demonstrate that. And these devices will demonstrate that facilities-based competition is here. This competition will greatly benefit consumers through lower prices, more choices, and better service. In a converged communications world where consumers will purchase an entire suite of services from one company rather than each service individually from multiple companies, competition forces companies to innovate to keep or attract customers. That is something that will benefit all of us.

Mr. Chairman, thank you again for holding this hearing. I look forward to learning more about the products brought by our witnesses today, and to ensuring that our constituents have access to these and other exciting communications products.

Mr. UPTON. Thank you. At this point we have concluded our opening statements. Now we are blessed with a superior panel this morning that will be led by Mr. Jay Birnbaum, Vice President and General Counsel of Current Communications Group; Mr. John Burris, Director of the Data Product Marketing, Sprint; Mr. Jack Jachner, Senior Director, Research and Innovation, Office of the Chief Technology Officer, Alcatel; Mr. Kevin Leddy, Senior VP, Strategy and Development, Time Warner Cable; Mr. Jonas Neihardt, VP of Federal Government Affairs, Qualcomm; and Ms. Adriana Rizzo, Executive Director, eServices for Verizon.

I know that generally we try to limit your remarks and opening statements to about 5 minutes. We may go over a little bit so we get to see some of the things that you have developed.

We will start with Mr. Birnbaum. Welcome.

STATEMENTS OF JAY BIRNBAUM, VICE PRESIDENT AND GENERAL COUNSEL, CURRENT COMMUNICATIONS GROUP; JOHN BURRIS, DIRECTOR, DATA PRODUCT MARKETING, SPRINT CORPORATION; JACK JACHNER, SENIOR DIRECTOR, RESEARCH AND INNOVATION, OFFICE OF THE CHIEF TECHNOLOGY OFFICER, ALCATEL NORTH AMERICA; KEVIN LEDDY, SENIOR VICE PRESIDENT, STRATEGY AND DEVELOPMENT, TIME WARNER CABLE; JONAS NEIHARDT, VICE PRESIDENT, FEDERAL GOVERNMENT AFFAIRS, QUALCOMM, INC.; AND ADRIANA RIZZO, EXECUTIVE DIRECTOR, eSERVICES, VERIZON COMMUNICATIONS

Mr. BIRNBAUM. Thank you. Good morning, Mr. Chairman and fellow members of the committee. I suspect that of the companies represented on this panel and the technologies, in fact, represented, Current Communications Group and Broadband over Power Lines, is probably the least well known. Let me start by just explaining who Current is.

We are a local company based just outside of Washington in Germantown, Maryland. We are both a technology developer and a services provider. One of our companies called Current Technologies has, in fact, developed a technically and economically viable way of providing broadband services over the electric power lines.

Much the way cable television and telephone companies provide broadband over the cable network and the telephone network, we have devised a safe and efficient manner to do that over the electricity wires. Current Communications, the sister company, is actually a service provider and is right now providing commercial

broadband services in Cincinnati, Ohio and we will start providing voice services, Voice-over-Internet protocol this summer.

Unlike the cable and telephone wire, electricity wires run essentially into every home, in fact, every wall of every home and business in the United States. That gives us an advantage, at least as far ubiquity. We are certainly later coming to the broadband game than cable and DSL companies. We recently announced the first commercial roll-out of Broadband over Power Lines in Cincinnati.

Our partner there is Cinergy Corporation. Our goal is to pass 250,000 homes in the next 3 years including thousands of small businesses. The commercial roll-out actually follows two technical trials, one in Cincinnati and one just out the beltway here with Potomac Electric Power. We had over 700 homes and 200 customers. We had very high satisfaction rates. We have now turned the commercial key and are providing multiple megabyte services, both data and voice, soon to be video, over the power lines.

Some of the advantages of BPL, as the FCC has now called it, because we can provide significant through-put, we get right now actually 2 to 4 megabits routinely, as high as 5 or 6 megabits per second, at every house, in fact, every outlet in every house. Our next generation products, which should be available within the next year or 2, actually can provide 50 megabits plus of service.

That means that we can provide competitive video programming services. We are now providing broadband data in Cincinnati. We are rolling out commercial Voice-over-IP services this summer. It is true plus and play technology. All a customer has to do is take a device like this one here, we call this a power line modem, inexpensive off-the-shelf device, plug it into any outlet in their home, and it instantly syncs up with our equipment on the poles.

Because the electricity network, again, goes to every outlet, this supports other applications, things like Internet radio. There are hundreds of radio stations that are available on the Internet both from the United States and from overseas. If you can plug in a radio instead of using rabbit ears or a regular antenna, you can plug it into an ethernet modem and you can actually listen to Internet radio or play Internet gaming in any outlet in the house. You can move computers and have multiple computers going on using the Internet simultaneously.

One of the reasons why utility companies are very excited about Broadband over Power Lines, though, is actually not because of the broadband services. I just want to take a minute to talk about some of the enhanced utility applications. When out equipment is installed on the wires, the utility companies can then engage in automated outage detection and restoration detection. They can provide preventive maintenance. They can actually monitor equipment on their network and find out problems before they result in outages.

We can do automated meter reading or the utility company can do automated meter reading which can result in time-of-day pricing and other enhanced functionality at the utility level. Certainly post-911 and with last year's blackout and Hurricane Isabel which hit this area hard, these enhanced utility applications are actually driving utility companies to look into and hopefully soon deploy Broadband over Power Lines.

I am sure you are all familiar with this picture. Basically the power network in the U.S. and, for that matter everywhere else, once electricity is generated at a power plant, it gets distributed to substations in local neighborhoods whether they be residential or commercial. Between the substation and the end users we have electricity stepped down to about 10,000 volts that runs down the streets right outside our houses.

Each cluster of homes in the U.S. has a transformer associated with it. It is that trash can looking device that sits on the telephone pole. That converts the fairly dangerous 10,000 volts into about 120 volts. The problem with Broadband over Power Lines and the difficulty in it competing over the last few years with cable and DSL is how to get around that transformer so we can actually run the broadband signals down the electricity wires.

What Current does is we actually overlay our equipment on the existing distribution portion of the electricity network between the substation and customer's homes. Working backwards from the house, again the customer installs a modem like this. This device will talk directly to our equipment that we install up on the poles. We call that device a bridge.

The bridge simply manages the traffic from all the customers served off that transformer by the electric company. That averages about six homes per transformer in the United States. Sometimes it is more and sometimes it is only one or two homes. We then essentially bypass the transformer by sending the signal around the transformer onto the higher voltage, the medium voltage, 10,000 volt lines.

We run that signal down the wires and, again, take it off of the 10,000 volt wires. We do that with a device called a coupler connected to a device we call a backhaul-point. That backhaul-point then will connect using fiber or wireless technologies, and even satellite.

One of the economic ways we think Broadband over Power Lines can be distributed, for instance, in rural area is to use satellite as a backhaul technology which certainly provides for some synergies with a video as well as data and voice. From there we connect them to the Internet through any voice network or eventually into video content service.

This is what the equipment looks like. Believe it or not, this took about—it has been in design for the last 20 years. Our company has been at it for 4. On the left-hand side you have a device. Again, we call that the coupler. It is the only device that touches the higher voltage wires and does so safely. Utility companies have helped us develop the safety techniques. Obviously they spent a lot of time keeping the 10,000 volts outside of customers' homes and businesses.

The two devices on the right look fairly similar and they have a lot of electronics inside of them but basically all they do is manage the traffic that goes in and out of the customer's house out to the Internet or from a video content server or into a voice network.

Once installed on the poles, this is essentially what it looks like. You see the transformer up on the right. This is true to scale. This is not actually a large transformer. Our device is much smaller than the electricity equipment that is already up there. Essentially

this is our bridge device which provides service into a home. It connects to the wires both below the bridge and below the transformer which are the low voltage wires.

It is hard to tell from this picture but a wire runs up the pole and connects to the medium voltage wires through our coupler. Much the way the transformer isolates the 10,000 volts and converts it down to 120 volts, our device isolates electricity entirely and just lets the broadband signal travel from one wire to the other. We have essentially bypassed the transformer and we have created a single contiguous communications path, yet maintain the integrity of the electricity network.

From the customer's standpoint Broadband over Power Lines is very easy. We have leveraged a standard called HomePlug which has been developed in the United States for local area networking inside the house, home or business for that matter. It is actually not a product that is proprietary to current.

They come in three forms. This is a ethernet version. They are made with USB connections, as well as WiFi or 802.11 connections. Because the power line signal is ubiquitous and it is essentially everywhere in your house, you can take this device and move it from room to room and in any room get video data or broadband signals.

That is the bulk of my presentation.

[The prepared statement of Jay Birnbaum follows:]

PREPARED STATEMENT OF JAY BIRNBAUM, VICE PRESIDENT AND GENERAL COUNSEL, CURRENT COMMUNICATIONS GROUP, LLC

On behalf of Current Communications Group I am pleased to introduce to the Subcommittee the latest broadband technology to revolutionize the way Americans can communicate: Broadband over Power Lines, or "BPL." BPL is now furthering the ongoing convergence of data, voice, and video services by offering consumers a third alternative for broadband access. Much the way other broadband technologies use the existing telephone and cable television infrastructure to provide broadband services, BPL converts the electric distribution network into a broadband super highway.

Current Communications Group has developed a proprietary, safe means of using the electric distribution network to provide data, voice, and video communications services. By installing its BPL equipment on an electric grid, Current transforms the electric network into a robust communications network that offers customers speeds much faster than that available from DSL and cable modem systems today. Specifically, Current's customers can enjoy always on, broadband speeds up to four megabits or more at every outlet in their home or business. Moreover, whereas DSL and cable modem are largely asymmetrical in nature—that is their advertised "download" speeds are much faster than the speeds at which consumers can actually send data, pictures, or video—BPL offers the same fast speed whether one is sending or receiving information. This means consumers can send pictures, videos and other large files and play on-line games much more effectively.

Although BPL is not conceptually new, commercially speaking it is in its infancy. Current and the Cinergy Corporation recently announced the first commercial deployment of the BPL in the United States. Although the commercial deployment has only recently begun, together the Current-Cinergy joint venture plans to enable several hundred thousand homes in Cinergy's electric service territory during the next three years. In addition, Current and Cinergy have created a second venture to market and deliver Current's BPL technology to small municipal-owned and rural cooperative electric utilities throughout the country. Because electricity lines run into virtually every room of every home and business, BPL can deliver broadband to many areas where cable or DSL simply cannot reach, or cannot reach economically. In fact, BPL married with broadband satellite can be a powerful force to serve rural areas.

The Cincinnati commercial roll-out follows two year-long trial deployments of Current's technology, one in Cincinnati, Ohio with Cinergy and the other with Potomac Electric Power, or Pepco, in suburban Maryland just outside the Washington, D.C.

Beltway. These trials included more than 200 hundred customers, including both residences and small businesses. The trials also confirmed the robust nature of BPL and elicited strong customer satisfaction and desire for commercial BPL service in areas where cable modem and DSL service were already widely available.

Through BPL customers can enjoy robust broadband data speeds at virtually every outlet in their home or business. This summer Current will also begin offering voice telephony service over its BPL network using Voice over Internet Protocol, or VoIP. Current's broadband Internet access offering will in many cases be a consumer's first and only choice to participate in the broadband revolution, since cable modem and DSL are not available everywhere. Indeed, according to one recent study more than 87 million American homes still do not use broadband, remaining relegated to dial-up access or no access at all. At a minimum, however, BPL will afford consumers another broadband outlet with features and price points better suited to the way Americans really want to "Surf the Net." Similarly, Current's full VoIP service will often be a consumer's only alternative to second and third line local voice service.

As far as video, existing iterations of BPL technology and service already support high quality video streaming over the Internet. Current's BPL technology, for instance, actually enables users to send and receive video, whether it be in the form of real-time, on-line games or home movies downloaded from a camcorder, faster than other broadband technologies. Next-generation BPL technologies will offer users speeds in excess of 50 megabits, paving the way for true digital quality video programming, such as video on demand, within the next two years.

So how does BPL work? From a consumer standpoint, Current's BPL solution is simple to use. The customer plugs a small, off-the-shelf, inexpensive "powerline" modem into any wall outlet in the home or business. That modem easily connects to a user's computer via a standard USB or Ethernet cord, or even using a wireless fidelity, or "WiFi," connection. The customer need do nothing further other than register on-line for service much the way he or she would register for any other Internet-based service. Literally in a matter of minutes the customer is surfing the Internet without the need for a technician's visit.

A signal from the consumer's computer travels the through the consumer's powerline modem, over the 120 volt premises wiring and "low voltage" electricity wire outside the home or business toward the utility company's "step-down" transformer. The utility uses transformers to convert the medium voltage (e.g., 10,000 or more volts) electricity that runs down the street from one of its distribution substations to the 120 volts that can safely come into homes and businesses. Because the medium voltage lines carry such high voltages and because the step-down transformer also tends to block any BPL signals on the power lines, sending BPL signals along such wires and past transformers historically had been difficult. But at each transformer Current installs its proprietary BPL equipment, which enables Current safely to "bypass" the transformer and send BPL signals to and from the low and medium voltage lines. This enables us to form a single, integrated communications path on the electricity wires while preserving the integrity of the electricity network. Once on the medium voltage line the BPL signals travel down the wires to an aggregation point, where Current's equipment again safely extracts the BPL signal from the medium voltage wires. Current's equipment then converts the BPL signals into traditional communications packets and sent along fiber, wireless, or other means to reach the Internet, a voice telephony network, or some other network. Communications traffic headed to a customer from the Internet, voice telephony network, or video content server simply travels the reverse path.

Finally, BPL is not just a consumer application. By effectively overlaying a communications network on the electric distribution grid BPL enables electric utilities to improve the safety, reliability, and efficiency of their networks. Once installed, BPL technology enables a utility to engage in power outage and restoration detection on an automated basis, rather than waiting for consumers to call and begin a process whereby the utility must dispatch crews for a painstaking seek and restore operation. Similarly, BPL equipment can communicate with utility equipment such as specially designed IP-enabled meters and switches to offer automated meter reading, time-of-day pricing, load management, demand side management, and remote monitoring and operability of the local electric distribution system.

The desire for a more efficient and reliable network is a key driver for utility companies seeking to deploy BPL in their territories. Given the post 9/11 world, the better our critical infrastructure is monitored and maintained, the better utilities and others can avoid or respond to unforeseen events. Even last year's August Blackout and Hurricane Isabel revealed the vulnerability of the electric distribution network, a condition upon which BPL can certainly improve.

Mr. UPTON. Thank you.
Mr. Burris.

STATEMENT OF JOHN BURRIS

Mr. BURRIS. Yes. Thank you. Good morning, Mr. Chairman, Members of Congress. I work for Sprint. I run our wireless data business there. Over the next 5 minutes I hope to show you guys some pretty cool technology that we have that really most of our consumers have in their hands today.

If we have a few moments, it would be great to hand out a few handsets that I brought while I can of give my overview slides. Feel free to browse around. We have a very cool kind of hot product right, live TV called MobiTV, as well as we have a live product called MobiMLB which is live baseball audio. If there were some baseball games being played this early in the morning, you can choose either your home announcer or visitor announcer and listen to live baseball.

Mr. UPTON. We were hoping the Cubs would have had extra innings.

Mr. BURRIS. Or you could have watched the perfect game last night or, at least, you know, listened to it.

Real quick, a few things that are going on. There is no question that at Sprint and at several other carriers here in the U.S. wireless data services, which in a lot of ways is kind of the center point of the convergence of video, voice, and data, are an important part of our business. It is a huge mandate at Sprint to be the No. 1 or certainly play in the short list of winners in the wireless data space.

To this end we have got a big portion of our customer base that have wireless data handsets. Over half of our customers have got handsets that can do the various services that you guys will be showing off there.

We sell over 4 million plus downloadable applications a month so whether it is ring tones, screensavers, games, it is a hot product today, primarily in the youth and young adult market, but as well as applications come out that appeal to a broader set that is growing as well. Of course, the business is growing. As an indicator of customer adoption, money is being made in this space at Sprint and other carriers.

Real quick what is kind of going on is that we have got the right networks today and, of course, with some of our partners like QUALCOMM. Even faster and better networks are down the line here. Sprint has got a great lineup of handsets so it really takes a great network, great handsets.

Then it takes great data plans. It is key to have plans that are understandable to customers, that have unlimited data usage with them, or customers don't have to learn how many kilobytes an e-mail is or how much TV they are watching. We have those as well. Then, of course, it takes the right services, services that truly appeal to customers on the handset.

So real quick, what are some of those services? Of course, as you guys know, you can browse the Internet on your handset. You can send text messages. Those are kind of table stakes today. Sprint made a big bet a year ago that taking pictures and now 15 second

video clips and sending those over the wireless network would be a big deal and it is.

We have penetrated our base with wireless camera phones more than any other carrier in the U.S. In the last 8 months we have over 100 million pictures and videos uploaded or shared across our network so it is a phenomenon that is happening and will continue to grow with all carriers over the next few years. Of course, as folks know, ring tones and music on the handset, those things are popular. I can play some of that stuff later today if we have some time.

Wireless games are a big deal. Most of the carriers have embraced the idea of wireless games. I will talk a little bit about some of the cool things Sprint is doing in that category. And then something that I think Sprint leads in today is multi-media services. Are the 1x network that we have over the entire nation we have got some very cool products that you guys are probably viewing right now, live TVs whether it is MSNBC, FOX Sports, or live MLB updates. We have that on your handset and it is selling very, very well.

Real quick I have three kind of high-level slides here in a couple of key categories that we are excited about. One is gaming. People are downloading just about a million games on our network each month and playing these on the handset. Of course, the wireless network is also a great place to play multi-player games. Those are very popular.

Then Sprint was the first carrier to launch a game lobby so a wireless community of gamers, hardcore kind of gamers that can have a single sign-on across multiple games who can talk to each other, share high scores, request that you download the baseball game they are playing and invite you to play if you have some free time. These things are taking off like crazy. Other carrier are asking to be a part of that.

One of the most talked about applications we have right now is called MobiTV. It is live TV. We have about 15 channels. This is an example of a clip, kind of the Mars lander. As you guys can see, we have MSNBC so you can watch Chris Matthews anytime you want, Rudy Guiliani kind of hearings this morning, live baseball updates. There are music videos, cartoons. It is a handset and a service that we are finding that is shared not amongst just the person who pays the bill but with spouses, husbands and wives, and then, of course, kids. It is a service that everybody is gravitating toward. And with Sprints plan for about $10 a month you can watch all the TV you want. Pretty much unlimited.

The next product we have is, or the last slide that I have is on a new hot product that launched just in the last few weeks. This is live baseball audio. For all the teams in the major leagues if a game is currently being played, you can go to your sprint phone and listen to those games. You can choose the home announcer, the visiting announcer. If you're a Cub fan, you can always hear the announcer you want to hear talking about the games.

Mr. MARKEY. What if you are Red Sox fan?

Mr. BURRIS. Red Sox fan same thing.

Mr. SHIMKUS. Cardinal fan.

Mr. BURRIS. Red Sox come in very clear as well. As well as, of course, you can pop over to MobiTV and actually watch actual video of games and highlights and those kinds of things.

These are some of the key services. They truly are a convergence of products. The live TV product, as you can guess, has raised eyebrows and we are having discussions with all kinds of players in the space whether it is the entertainment outlets that actually create the content, whether it is the cable providers that are partners of ours today as we discuss how does this change the playing field. It affects the Internet insofar as services that today require broadband networks can now work over handsets. Again, a very exciting space, very cool technologies that I think will continue to grow. Thank you.

Mr. UPTON. Thank you.

Mr. Jachner.

STATEMENT OF JACK JACHNER

Mr. JACHNER. Good morning, Mr. Chairman and members of the subcommittee. My name is Jack Jachner and I work for Alcatel as a Senior Director in Alcatel's corporate research organization. I lead a worldwide research team based here in the U.S. focused on the development of converged applications delivered over a converged IP infrastructure. Alcatel is one of the leading vendors of Telecomm infrastructure worldwide, with a broad portfolio of products that support both the service provider and enterprise markets.

In the service provider market, Alcatel is a market leader in Broadband Access, Optical Transport, Class 5/Class 4 switching—with over 310 million lines deployed worldwide—and Intelligent Networks. Alcatel is also a leader in the supply of multi-service switching, Edge Routing, VoIP softswitches, VoIP gateways and 2G/2.5G and the emerging 3G wireless solutions.

In the Enterprise market, Alcatel is the leading supplier of converged IP Telephony and Contact Center solutions and provides a comprehensive suite of Enterprise switch products. Finally, Alcatel is also the only telecommunications equipment vendor that develops and supplies satellite based communications systems.

Today, I will focus on two aspects of the convergence of Voice, Data and Video where technological evolution is driving change in communication services and markets. The first aspect is that of converged transport, leading to increased competition, and the second aspect is of converged functionality, leading to new services and opportunities.

Technological evolution in networks, in algorithms and in cost reduction of computing has enabled the convergence of transport of Voice, Data and Video. So now a twisted pair cable which has historically been deployed to deliver only voice services, can now also deliver broadband data and video services, using DSL technology. A coaxial cable can, in addition to television, deliver telephony and broadband data. Other access technologies have emerged including satellite, wireless and fiber to the home. Not just the access, but also the core of the network, can now be converged.

This convergence in transport has stimulated competition between what were previously distinct sectors of service providers, and has enabled new entrants. The ramifications of this techno-

logical change are currently playing out and creating a dynamic market.

The convergence of transport is also changing the way Enterprises communicate, both internally and externally. First internally, VoIP is gaining rapid acceptance for Enterprise employees, in remote offices or on the road, to call headquarters. And now externally, VoIP service providers are emerging.

During the first quarter of this year, Alcatel's enterprise division shipped 35 percent of its large PABX lines as IP Telephony. Our next generation phones provide both voice and application integration, with a screen and keyboard to access web services.

This leads to the second aspect that I would like to address, namely the convergence of the functionality of voice, data and video in new applications. As an example of the new services that are emerging let's consider the convergence of traditional telephony and of Instant Messaging. Traditional telephony can be enriched by the indication of Presence, which is used in Instant Messaging.

Presence gives an indication of the availability of the person we wish to call, typically shown as an icon on our screen. If the person's Presence indicates "unavailable", "on-the-phone" or "out-to-lunch", then we may choose not to call at this time. Presence reduces the occurrence of the busy signal and of voice mail tag.

A complementary notion is that of Preference, as I may choose to use Presence in order to maintain my privacy or to manage my time. For example my Presence might be "available" to my boss, but only during working hours, and "available" to my family, except when I am in a meeting.

Another example is convergence of Telephony and real-time text—using Instant Messaging or SMS on mobile terminals. Real-time text that arrives with my call, can be used to deliver the Subject of my call. The call subject helps the receiving person to decide whether to take the call.

As you can see from these examples, blending of Telephony and Instant Messaging offers rich new uses.

Blending of telephony and video can also enable video conference meetings, which today are rather complex to set up. Soon, video conferences will be as easy as conference calling.

In Enterprises, the blending of telephony and data enables extending enterprise services beyond its borders. Traditional PSTN connectivity was very good at delivering calls, but had very little additional capability. Today the underlying IP network can deliver the signaling to support rich enterprise services to be accessed remotely. My home phone or my cell phone can provide the dial tone from within the enterprise, with four digit dialing and secretarial assistance, as if I were at my office.

These Enterprise services can be provided from the Customer Premises, or by service providers over IP networks. Traditional Centrex service is evolving to IP-Centrex, with a middle ground mixing customer-premise with network-based solutions.

It is these and other applications that are the ultimate benefit. The convergence of transport is the first step, and the technology exists today—the market impact has begun. The convergence of functionality is the next step—the technology is just emerging, and will impact the market in the next 2 to 5 years. It is a dynamic

and exciting time for both convergence technology and for the communications marketplace.

Thank you for your attention.

[The prepared statement of Jack Jachner follows:]

PREPARED STATEMENT OF JACK JACHNER, SENIOR DIRECTOR, RESEARCH AND INNOVATION, ALCATEL

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Thank you for your attention.

Mr. UPTON. Thank you.

Mr. Leddy.

STATEMENT OF KEVIN LEDDY

Mr. LEDDY. Good morning, Mr. Chairman, Congressman Markey, and members of the subcommittee. My name is Kevin Leddy, I am Senior Vice President of Strategy and Development for Time Warner Cable. I do primarily strategy work in our advanced technology group.

I am very excited to have the opportunity to talk about how convergence is enabling Time Warner Cable and our cable industry colleagues to offer American consumers a vast array of innovative new services over one integrated state-of-the art network.

As a direct result of significant capital investment we have transformed networks designed for the delivery of one-way video into digital thoroughfares capable of bringing consumers a "triple-play" of advanced video, high-speed data, and now voice service. Since 1996 the cable industry as invested more than $85 billion in private risk capital to rebuild and upgrade its facilities.

At Time Warner Cable 98 percent of our customers are today served by two-way broadband cable systems. Dollars invested are only important to the extent that they translate into products and services that are valuable to consumers and I would like to talk to you this morning about some of those products and services.

No longer just a one-way means of delivering a preset menu of programming, video technology today empowers consumers by giving them control, convenience, and choice. New enhanced digital video products such as Video on Demand, Subscription Video on Demand, and digital video recorders have made video a two-way interactive experience.

Using these services and products, customers can access programming they want to watch when they want to watch it. They can rewind, fast forward, pause or stop programming and resume watching at a convenient time. They can program their digital video recorder to find, record, and store programming they enjoy and then watch it at their leisure.

There are now more than 22 million digital cable customers across the country. At Time Warner our digital video penetration exceeds 40 percent. Although digital video recorders were only introduced to Time Warner customers about 18 months ago, we now have almost half a million DVR customers.

New technology also allows us to offer customers the high definition programming being offered by broadcasters and cable networks. Time Warner cable has HD carriage agreements with all the major broadcast networks and by year end out cable systems will offer an average of 15 HD channels each. That number today is about 12.

I am also pleased to report that by the end of 2004 cable modem service will be available to nearly 100 million U.S. homes. At Time Warner cable we recently launched faster download speeds in all of our markets and that speed now averages about three megabits a second.

Our residential Internet access customers now exceed 3.4 million which represents more than 30 percent of our customer base. To enhance the Internet experience we also offer our customers both wired and wireless home networking solutions. Perhaps the most dramatic example of convergence to benefit consumers is in the area of telephone competition. Advances in Voice-over-Internet Protocol technology, or VoIP, have enabled Time Warner and other cable operators to use their new broadband networks to offer subscribers high quality, reliable, local and long distance telephone services. Now true facility-based competition is becoming a reality.

After several years of testing and developing a potential VoIP offering, Time Warner Cable launched VoIP service on a commercial basis to residential customers in a number of markets. In our first market, Portland, Maine, 11 percent of households in the market have subscribed to our phone service in just 1 year. We plan to make VoIP operational throughout most of Time Warner Cable's footprint by the end of 2004.

In addition to a facilities-based alternative to the incumbent TELCO, deployment of VoIP by cable operators also has the potential to provide customers new features and functionality. Video conferencing, interactive gaming, and other multimedia applications will over time demonstrate the real benefits consumers can reap from the integration of video data and voice over a single broadband network. Features like unified messaging or e-mails and voicemails can be checked and responded to on your TV is one possibility we are developing.

Having made a substantial investment in new technology, Time Warner Cable is leading the way in offering consumers the greatest possible benefits from advanced digital services. Our upgraded network allows us to offer subscribers a robust triple play package of voice, video and data services at a discounted price for the consumer. Our networks capability means that we will be able to deliver additional services quickly to all consumers.

Thank you again for the opportunity to speak with you today.

[The prepared statement of Kevin Leddy follows:]

PREPARED STATEMENT OF KEVIN LEDDY, SENIOR VICE PRESIDENT, STRATEGY AND DEVELOPMENT, TIME WARNER CABLE

Good morning Mr. Chairman, Congressman Markey, and members of the Subcommittee. I am very excited to have the opportunity to share with you the details of how convergence—driven by technological advancements and fueled by years of steady investment—is enabling Time Warner Cable and our industry colleagues to offer American consumers a vast array of innovative new services, features and functions over one, integrated state-of-the-art network.

At the outset, it is important to note that the transformation of networks designed for the delivery of one-way video service into digital thoroughfares capable of bringing consumers a "triple-play" of advanced video, high-speed data, and now voice service, is a direct result of significant capital investment. Since 1996, the cable industry as a whole has invested more than $85 billion in private risk capital to rebuild and upgrade its facilities, including $10.6 billion in 2003 alone.

At Time Warner Cable, we have spent over $5 billion since 1996 on plant related rebuilds upgrading, enhancing and growing our network so that we could deliver a full suite of new services and products as quickly as they become available. As a result, ninety-eight percent of Time Warner Cable subscribers are today served by a 750 MHz cable system capable of carrying two-way broadband transmissions. But dollars invested and technological capabilities are only important to the extent they translate into products and services that are valuable to consumers. And I'd like to talk about some of those with you this morning, starting with our traditional video business.

Our Video Business

Although video was once perceived as a mature line of business with little prospect for growth, digital technology has changed viewer behavior dramatically. No longer a one-way means of delivering a pre-set menu of programming, video technology today empowers the consumer by giving them control, convenience and choice—which have always been the hallmarks of cable television. New enhanced digital products such as Video on Demand (VOD), Subscription Video on Demand (SVOD), and Digital Video Recorders (DVRs) have made video programming a two-way interactive experience in which consumers can make sure that their viewing preferences match with their schedule preferences.

Using these services and products, customers can access programming they want to watch when they want to watch it. They can rewind, fast forward, pause or stop programming and resume watching at a convenient time. They can program their personal digital video recording service to find, record, and store programming they enjoy—as well as programming that meets criteria they set, and then watch it at their leisure.

All these new products are driving digital penetration in America. There are now more than 22.2 million digital cable customers across the country. At Time Warner Cable, our digital video penetration has reached 41%. That's about 4.5 million digital subscribers, a 16% increase from the previous year. The number of VOD customers has more than tripled between 2002 and 2003. And although DVRs were only introduced to Time Warner Cable customers beginning in the late summer of 2002, we now have 458,000 DVR subscribers as of the end of the first quarter of this year. Based on the enthusiastic consumer response in this still early stage of deployment, we expect these numbers to continue to grow as these products become more widely available and more and more Americans realize their value.

New technology also allows us to offer our subscribers the high-definition ("HD") programming being developed by broadcasters and cable networks. Time Warner Cable has carriage agreements with all of the major broadcast networks for the HD programming carried by the stations they own, and by year-end, our cable systems will offer an average of 15 HD channels each. As HD programming becomes more widely available, we will seek to incorporate it into our service offerings. We support the broadcaster' transmission of high-quality HD programming that is helping drive the digital transition. Aided by the drop in price for HD sets, consumers are responding. Last year, for instance, our HD subscribership grew 218%.

Our Data Business

As this Committee knows, residential high-speed data services are enriching the lives of more Americans than ever. And I am pleased to report that by the end of this year, cable modem service will be available to nearly 100 million homes. More than 90% of all the homes passed by cable systems have access. The seven largest cable MSOs have all deployed high speed Internet service nearly ubiquitously or will reach that goal in the very near future.

At Time Warner Cable, we recently launched faster download speeds in all our markets, and we unveiled an all-new redesigned version of our Road Runner high speed Internet access service last quarter. We've also increased our spending on customer service, to ensure that our customers can derive the fullest benefit from all these new services.

Consumers clearly have seen the benefits from cable modem service. Our residential Internet access customers now number over 3.4 million, which represents 18% of eligible homes passed. To enhance the Internet experience, we also offer our subscribers home networking, both wired and wireless, that allows multiple computers in a home to share a single Internet connection and to connect to one another. We offer wireless home networking for data using WiFi (802.11) technology and are considering deploying WiMax. Time Warner Cable is also offering a whole house solution for all parts of our service. This will include a multi-room DVR for routing video and voice service networked via the customer's existing in-home telephone wiring.

Our Voice Business

Perhaps the most dramatic example of how investment by the cable industry and new technology have "converged" to benefit consumers can be found with respect to the voice services long dominated by incumbent telephone companies. Advances in Voice-over-Internet Protocol technology—or "VoIP" as it has come to be known—have enabled Time Warner and other cable operators to use their new broadband networks to offer subscribers high quality, reliable, local and long distance telephony services. Now, for the first time, facilities-based competition is a reality.

After several years of testing and developing a potential VoIP offering, Time Warner Cable launched "Digital Phone" service on a commercial basis to residential customers in Portland, Maine in May 2003, and we now serve over 11% of customers there. In addition to Portland, we have launched Digital Phone service in five markets: Raleigh, Kansas City, Rochester, Syracuse and Charlotte. Nine additional markets served by Time Warner Cable have turned up dial tone, but are still in the testing phase of their rollout. We plan to make Digital Phone operational throughout the majority of the Time Warner Cable footprint by the end of 2004.

To the customer, Digital Phone feels just like conventional telephone service. Digital Phone customers can receive voice service over each existing telephone jack in their home; can maintain their current telephone numbers (nearly 85% do so); and have access to toll-free 800 calling, Telecommunications Relay Services for the disabled, Enhanced 911 (E911) services, and Directory Listings. Digital Phone also includes the capability to assist law enforcement agencies by permitting the interception, when necessary, of both call identifying information and call content in response to lawful requests. Time Warner Cable views this as a critical aspect of its service in this time of heightened national security and law enforcement concerns. Finally, Time Warner Cable contributes to both state and federal universal service funds in connection with our Digital Phone service.

The upgraded, two-way capable, digital network that we have built during the past several years is the central component of the architecture used to provide Digital Phone services. And unlike some other VoIP services, which use the public Internet, Digital Phone traffic travels within our proprietary network. As a result, Time Warner Cable's Digital Phone service is delivered with quality of service standards designed to ensure that customers are provided with the same high quality of service they have come to expect from traditional telephone service providers.

In addition to a facilities-based alternative to the incumbent local telephone company, the deployment of Digital Phone service by Time Warner and VoIP services by other cable operators also has the potential to offer consumers new features and functionality such as multimedia conferencing, interactive gaming, and other multimedia applications which will over time demonstrate the real benefits consumers can reap from the integration of video, data, and voice services over a single broadband network. Features like unified messaging, where emails and voice-mails could be checked and responded to on your TV screen is one possibility. Others might include a variable dial-tone feature, whereby callers can get immediate sports or weather updates.

The Benefits of Convergence

Time Warner Cable is leading the way in offering consumers the greatest possible benefits from offering all our advanced services over one enhanced digital network. Our upgraded network allows us to offer subscribers a robust "triple play" package of voice, video and data services at a discounted price. This offering has proven extremely valuable to consumers; in Portland, for example, over 75% of our digital phone customers take the "triple play."

Our network's digital capability means that it will be capable of delivering additional services quickly to all consumers without having to invest in substantial new construction. We designed our current upgrades to allow us to transition to the all-digital world we see on the horizon. As use of analog technology fades, we will be able to add capacity through electronic upgrades. Combined with the additional capacity that naturally flows from the replacement of analog with digital—one retired analog channel allows us to launch nine or more digital channels—we are well positioned to serve our customers far into the future.

Thank you again for the opportunity to speak with you today, and I look forward to your questions.

Mr. UPTON. Mr. Neihardt.

STATEMENT OF JONAS NEIHARDT

Mr. NEIHARDT. Thank you, Mr. Chairman. Jonas Neihardt from QUALCOMM. If I can ask Mr. Clocker to put our AV feed up. Thank you very much. I am representing QUALCOMM out in San Diego, California. I would like to thank many of you on the committee who have made the trip out to our laboratories to see some of these technologies I am going to show you today in the lab or at the CTIA show.

I am very proud today because now——

Mr. MARKEY. May I also note that Mr. Neihardt actually worked on the Telecommunications Subcommittee many years ago.

Mr. UPTON. Hard not to call him Jonas.

Mr. MARKEY. He is so successful we have to call him Mr. Neihardt. He has done extremely well. I am sorry to interrupt.

Mr. NEIHARDT. Thank you, Congressman. So, again, we have shown you some of these technologies in the lab and now we are very proud because the signal that you are seeing that is being displayed on the monitors here is not coming from a hardwired solution or a special setup that we have here for the hearing room but it is coming from the cellular infrastructure outside of this building and coming in through the windows behind you and into my little antenna here on my lap top. I have a spare here to show you.

What we have done here working with Verizon is set up a high-speed data capability that covers in Washington, DC this entire area in yellow, about 550 square miles of ubiquitous high-speed data coverage that is also hands off. I have driven in my car from Manassas all the way downtown and kept up a continuous data session all the way into DC. You can see we have Congressman Wynn's district covered substantially and working up the highway here to Congressman Cox's district and it will be there shortly, sir.

Mr. UPTON. I'm looking at a blank space there in Southwest Michigan. Do you see that?

Mr. NEIHARDT. The area in red you see is Verizon's 1x data coverage and I'll let Verizon speak in a minute about their plans for future deployment of this high-speed data service. I know that many of the areas in red they plan to cover shortly.

Let me just run this thing through its paces here and go to a couple of my favorite websites just to show you how fast this is. Again, this is not a canned demo. This is a live demo. We'll go to some of the cities that I like to visit in Michigan. Come on Battle Creek. Come on up. We will have to come back to Battle Creek.

What I am doing here is just surfing the web. This is a wireless connection that, again, is available commercially through Verizon and throughout the Washington, DC area and then will be carried

more broadly throughout the country by Verizon over the next 18 months. What this technology permits you to do is access the Internet at typically between 300 and 500 kilobits per second and with bursts up to two megabits per second.

Here we go, Mr. Stearns.

Mr. UPTON. Does Bass not have a website.

Mr. NEIHARDT. I think he does. We will have to find it. I may have found the best way to exceed my 5 minutes here. Okay. Here we go. Let us see how fast we can do this. This is pretty speedy. Again, this is coming from the cellular infrastructure outside of this room and is available throughout the Washington, DC area ubiquitously. Since I got a nice intro from my old boss, I will have to do this for the Red Sox and since I know the Chairman's favorite team.

Although a bit challenged this year in terms of overall team speed, we can pull the website up pretty quickly.

Mr. UPTON. They are giving cough drops to Sammy Sosa.

Mr. NEIHARDT. There you go. Favorite place, Wrigley Field. So what we wanted to show you then is that we can go all over the Internet and wirelessly show you speeds that are similar to what you are used to seeing on your desktop. Let me go through the fuselage here to show you how it works.

What we are trying to prove here today is that the data speeds that are capable through the wireless Internet are approaching what can be attained in the fixed Internet. We actually believe that because mobility and ubiquity are so valuable to people and that the economics are so powerful for wireless solutions that over the next few years the wireless Internet usage will exceed the wireline Internet usage.

How will this happen? There is a couple different ways. What I am showing you today is this top bar which is CDMA2000 1xEV-DO. We are better at technology than marketing. This is our name for it. This is a solution that runs in 1.25 megahertz of spectrum so a little sliver of spectrum. This is in Verizon's current spectrum.

Here is another solution called EV-DV that adds a voice component. Then in new spectrum there is a solution called wide band CDMA that will also provide high-speed voice and data. We think that of the six wireless operators in America, the major ones, and, of course, there are many smaller ones, they will go along one of these paths and provide at least six new data pipes to homes and individuals.

I have talked a bit how EV-DO works. Again, reuses the cellular infrastructure. This is very important economically. We find that customers around the world really value mobility in their data usage. It is sort of analogous to the fact that cell phones are driving pay phones to extinction. We believe that people will not want to go to a place to log in or plug into a wall or to find a wireless hot spot. Rather, they will value ubiquity and want to log in wherever they are. Just like nowadays we all talk on our cell phones and we don't look for pay phones anymore.

Devices for these technologies, again, I showed you the little card that I am using here. In Asia our customers over there are deploying millions and millions of EV-DO-enabled phones for personal broadband and those phones will be coming here shortly. What are

we doing next? We are going to make it faster and cheaper and better and smaller and bring all these solutions, we hope, right into little handsets that people will find very useful and valuable.

Mr. UPTON. Just for the benefit of the folks up here, if you would just hold your lap top up and just show that there is no strings or cord attached.

Mr. NEIHARDT. Right. I have my power line here. This is the cord that attaches me to the AV system. I am here on the Internet with only——

Mr. UPTON. Just the power cord.

Mr. NEIHARDT. Just my little antenna and no strings attached.

Mr. UPTON. Terrific. Thank you.

Mr. NEIHARDT. Thank you.

Ms. Rizzo.

STATEMENT OF ADRIANA RIZZO

Ms. RIZZO. Thank you, Mr. Chairman, members of the subcommittee. I am Adriana Rizzo and I am here with my colleague, John Reformato. We work for Verizon and our job is to develop the applications that ride on Verizon's new high-speed broadband platforms. What we really do is we are part of a group that gets to create the cool new gadgets that consumers want. We actually have a pretty fun job.

Everyday about 100 million Americans connect to a Verizon network. To keep that progress growing, we at Verizon are reinventing our networks around broadband, packet and Voice-over-IP technologies. Today, in fact, Verizon is announcing the rollout of fiber-to-the-premises, or ATTP, in our first city, Keller, Texas, which is right outside of Dallas.

It is a pretty amazing technology. The slowest broadband connection we will offer customers will be three times as fast as broadband speeds commonly available today. Our plan is to reach a million homes by the end of the year and potentially double that rate by the end of 2005.

Our customers are actually beginning to demand already the types of products that FTTP makes available such as home monitoring, photo sharing, video conferencing, interactive gaming, and other demand video services. But there is a lot more. Obviously you have seen EV-DO and you have seen that it is working quite well here in Washington. It is also working in San Diego. By the end of the year we are going to be expanding EV-DO to one-third of our wireless network which will cover about 75 million Americans providing wireless high-speed connections instantly.

Verizon's other major role, though, is creating the tools that help people use these networks. That is where our product iobi comes in. I am going to take you through a little demonstration of that. What you see on this slide at the bottom is basically our networks, wireline, wireless, broadband, soon fiber. These are the networks that people connect to every day.

What you see at the top are the devices that they use to connect to those networks. For the most part this has been a one-to-one relationship. This is where iobi comes in. Iobi is both a product and a software platform that we will bring to market this year. As a software platform it allows us to develop features and services that

work across our networks and across devices, and it also allows us to work with outside companies and use their products and provide them to our customers through that platform.

Also because it is a software platform, it can actually run on APC, on a phone, on a television screen, and you can access it through a website. But the best way to really see what iobi does is to actually show you so I am going to take you through a couple of simulations first using this prototype. I will see if I can turn this around so you can see it.

This is a prototype of a cordless phone and it will also have a DSL modem and it will have a wireless router imbedded in it. At the same time it has a rather large screen. It is a touch screen that is connected to the Internet and it runs the iobi software.

What this allows you to do is I can simply come to this phone at any point during the day in my home and I can see exactly what has been happening. For example, I can simply click on it and see all the calls that I have received since I checked last. I can see whether those calls have pictures attached to it because iobi allows you to take a picture on your camera phone and send it to anybody that is using iobi so you can get pictures on your lap top or on this device.

It also give me visual voice mail which our customers tell us they want a lot. The reason they want it is because now they see exactly who has called, when they have been called, and they can decide which of these voice mails they want to listen to now and which ones they can, frankly, wait until later. Listening to it is also simple so that gives them a lot more control about what they want to listen to and what is important to them at that particular moment in time.

Another feature on here that I like very much and our customers really love is the ability to leave memos and you can leave memos in a couple of ways. You can actually write the memo right on the screen because you can write on the screen and you can leave that. Or you can leave a memo such as this one. "Happy birthday to you."

The reason you can do that is because this device also has a camera imbedded in it so leaving a video memo or placing a video call is as simple as just hitting record video memo or just start a video call. Anyone with another device such as this will be able to do that. The video memos are recorded and left on the device for as long as you want to keep them.

There are a lot of other services and features that this phone has but, in the interest of time, I am going to switch back to my PC to take you through a simulation of some of the things you can also do on the PC. I should mention that anything you can do here you can also do on the PC, you can do on the website, and you can do through our voice portal because everything rides on the same network and your information is always available to you.

Let me take you through simulation of a couple of things that I can do. For example, today I am in Washington and my boss is trying to reach me so he calls my New York office. Now, normally he wouldn't be able to reach me there but with iobi running on my PC I get a pop-up such as this that give me a few options. It tells me

that he is calling and it gives me 15 seconds to interact with that phone call in a variety of ways.

One way is I can route that call in mid ring to my cell phone and take the call immediately so that we can be connected. But if I am in a meeting such as this where I cannot be interrupted, I can also see if he is online and if he happens to be online, I can send him an instant message that tells them, "You know what? I can't talk now but let's talk in an hour." He can respond back very easily and now we know that we are going to be talking later and he knows that I have gotten his message. This is a very useful tool for us.

Let me show you one other thing that is very cool, at least for me, and this is conference calling but it is sort of conference calling on steroids. I don't know about you but I am on constant conference calls every day including weekends sometimes. What iobi allows me to do is by using my contact list on my iobi address book, I can simply drag and drop people into the conference call screen and as soon as I do that and I press the button that says "start conference call" iobi calls all the participants, gets them on the phone, then calls me, tells me which participants are now on the phone and allows me to immediately start this call.

It also makes it very easy for me to add a new participant to the call just again by dragging and dropping a person on that. The coolest thing that this does and the feature that I think everybody wants is that while you are on the call, you as the host have the power to mute anyone on the call or, if they are really annoying, you can drop them entirely from the call.

Everyone who sees this wants this product immediately. It also, frankly, lets you know exactly who is on the call because right now people call in to bridge numbers and you don't actually know who is on unless they announce themselves.

Anyway, Mr. Chairman, in the interest of time, there are a lot of other features and services that I could show you, some actually that will run on television but I think I am way over my 5 minutes so I thank you for the opportunity to show you these features and I look forward to your questions.

[The prepared statement of Adriana Rizzo follows:]

PREPARED STATEMENT OF ADRIANA RIZZO, EXECUTIVE DIRECTOR, ESERVICES, VERIZON

Hello. My name is Adriana Rizzo. I am the executive director for eServices at Verizon.

My job is to help develop applications that ride on Verizon's new, high-end broadband platforms.

Or, to put it simply, I'm part of a group that gets to come up with the cool new communications gadgets that consumers want. At the same time, I help make our networks more accessible so other companies can develop applications, too, and make our networks even more useful to the public.

The world is becoming "all broadband, all the time."

Around 24 million have broadband connections through cable or DSL.

More than 150 million Americans have a mobile phone.

And high-speed wireless networks are popping up everywhere.

Overall, more than 100 million Americans connect to a Verizon network every day.

To keep the progress going, we at Verizon are reinventing our networks around broadband, packet and voice-over-IP technologies.

Today Verizon is announcing the rollout of fiber-to-the-premises (FTTP) in our first city, Keller, Texas, just outside of Dallas. Once deployed, the slowest broadband

connection we'll offer customers will be three times as fast as broadband speeds commonly available today.

FTTP involves the use of glass, fiber-optic cable and associated electronics to replace traditional copper wires. This makes possible a vast array of new high-speed broadband services and video applications, along with our traditional voice and data services.

The fiber link into your home or business allows us to do things that aren't even on the drawing board yet, because the limits of copper go away.

Once this technology is in place, we also expect to be increasingly cost-efficient due to fiber's reduced maintenance and other operating expenses. One of the beauties of FTTP is that the technology will allow us to diagnose and correct problems, if and when they do occur in our network, much faster than today.

Our plan is to reach 1 million homes by the end of the year, and potentially double the rate in 2005.

We have been putting fiber optics to work for our customers for years, but its use has been limited for the most part to our long-distance and inter-city networks.

We in fact already have over 10 million miles of fiber-optic systems in our nationwide network, more than any other telecommunications company in the nation.

But until recently, it didn't make sense—financial and otherwise—to use fiber beyond big business. It was too expensive and too involved for mass, neighborhood use. Today, though, the technology for that level of use has matured. It works and it works well at the small- and medium-business level, as well as house-to-house, and it's cost-effective.

Perhaps most important, our customers today are demanding the types of products that FTTP makes available—things beyond basic and advanced data services—such as interactive gaming, photo sharing, PC backup and telecommuting, as well as video conferencing, premises surveillance, and other novel video services that can be delivered on demand and in high definition.

FTTP is one thing we're doing, but there's more.

We are the first to deliver a true wireless broadband wide-area network in major markets, with 3G technology, known as EV-DO.

It works a little like WiFi, but better. You don't have to be within a few hundred feet of a hotspot. EV-DO works over a much wider area. You can use it on a train or in a cab.

We are taking wireless into the broadband age, and we are committing $1 billion over the next two years to expand this breakthrough technology nationwide.

EV-DO will let people create, send and download content at broadband speed from their laptop while on the move. It also means people will be able to get richer, more visual services like video content, messaging and interactive gaming on their cell phone.

It provides new, powerful tools to put their creativity to work. Through EV-DO, Verizon is opening up even more opportunities for other sectors of the economy like applications developers who design and package these richer services.

EV-DO is already up and running here in Washington, and in San Diego. By the end of the year, we'll expand EV-DO to one-third of Verizon Wireless' network, covering 75 million Americans—providing wireless, high-speed connections instantly.

With EV-DO, and other plans we have for packet technologies and fiber, we are enabling a new generation of flexible, highly reliable services to ride on our infrastructure—from voice-over-IP to video messaging, to virtual private networking, to multi-player games, interactive learning and lots of others.

Verizon's other major role in the converged marketplace is creating the tools to help people use these networks.

This is where iobi comes in.

Most of what customers do to communicate can be done only in a single mode, on a single device.

Voice calls and messages arrive by telephone.

E-mail and IMs display on a computer or a PDA.

And entertainment comes through a TV or PC.

People end up with multiple networks and a briefcase or purse full of devices, and a desk full of callback messages.

iobi will bring them all together for true intermodal communication.

The essential function of iobi is to let customers use the Internet to manage and get information about inbound calls.

It puts customers in control of their own communications, and lets them configure the network they use to help them as they see fit.

The customer can make it happen themselves in real time, with just a click.

iobi makes this possible because it enables users to interact with their networks through a variety of channels.

And you don't need your own personal IT manager—or a 13-year-old—to set it up. It is easy to use and operate. You will even be able to use our voice recognition facilities to set things up, or to retrieve messages from any phone anywhere. The era of flashing "12-12-12"—like on the VCR—is over.

iobi translates all your incoming messages to the format you want, where you want, and it works with phones, PDAs, laptops, and, one day, digital TVs.

We believe ideas like these add immeasurably to the power of the networks we are building because they give the consumer more control. They make life more convenient for the consumer, cutting down on information clutter and lost time scrolling through voice mails and e-mails.

We look forward to more ideas like these, including:

- Peer-to-peer multimedia capabilities that will do for video what desktop publishing did for print;
- Video instant messaging; and
- Telemedicine, distance learning, virtual town meetings, and more.

Verizon's broadband networks will be the platform for thousands of new applications and devices—some from us, and many more from new businesses that form because this opportunity exists.

But most will come from customers themselves, who will put these technologies to use in ways that you and I can't even imagine today.

In order to create an environment in which these innovations can flourish, we at Verizon urge Congress to follow the example set in the wireless industry: Minimal regulation helped create that vibrant sector. We think the same thing can happen in broadband.

At Verizon, we're proud of what we're doing. We think our networks, our iobi technology, and the innovation we're making possible will send a jolt of growth, progress, and genuine excitement throughout the economy. The technological revolution underway is going to change our lives in ways we can only begin to imagine. I'm excited about this opportunity to build the future.

Thank you.

Mr. UPTON. Well, terrific. Thank you all for bringing in your dream machines that hopefully will soon be in our homes.

Mr. UPTON. Ms. Rizzo, I would be interested to know, you said you just started this in Texas just outside Dallas?

Ms. RIZZO. Yes. Fiber-to-the-premises we just announced this morning, in fact, in Keller, Texas, right outside of Dallas. It will be our first city. We have already started deploying fiber there and literally are digging and putting in fiber as we speak.

Mr. UPTON. So is it a different type of fiber that you might have in the east coast or some place else or not? Let me ask you this question. I have in my neighborhood here, I think, we have fiber in Alexandria for Verizon. Would you have to replace that fiber and have a different fiber for the iobi service or not?

Ms. RIZZO. I am sorry. Hold on. I am not an expert in fiber.

Can you answer this, John?

Mr. REFORMATO. It is the same fiber. We will be reusing the existing fiber and then adding new to the infrastructure.

Mr. UPTON. And these devices, how much will they cost a consumer, the device that you have there?

Ms. RIZZO. This device right here? We haven't actually finalized the price for it. We selected the manufacturer and have finalized the industrial design. We are looking to bring it to market at the end of the year. The first units will hit the market around Christmas time. But from a business model we haven't finalized the price.

Mr. UPTON. Do you have an idea what the cost will be?

Ms. RIZZO. I can tell you that it will be under our cost. The device itself is not what—we see it really as a way for customers to use the features more easily and to actually help us with DSL de-

ployment, but it really does depend on what the ultimate cost is going to be to us and we don't have that yet from the manufacturer.

Mr. UPTON. Mr. Leddy, your system that you indicated, and in your testimony, too, you have 11 percent of the market already in 1 year and 75 percent of the folks that you have as your customers have taken the triple-play option which is the whole range of services. What is the cost to the consumer that you are asking for the triple play?

Mr. LEDDY. The voice component of the package in the triple play goes down to $40 if the customer buys high-speed data and digital video from us at the same time. If he just buys the phone service, it is $50.

Mr. UPTON. Mr. Neihardt, how does the system work with handheld devices, pretty well? Have you tried that?

Mr. NEIHARDT. That is right. We have got, I think, 4 million subscribers in Korea who are using handheld devices and are very pleased. The uptake has been strong and we expect to add millions more in that country and then over here when the devices come over to this country.

Mr. UPTON. So is your system that you showed us today, could somebody actually do that today? I mean, you just did it today. Could we do it as well? Everybody can connect to the same type of system?

Mr. NEIHARDT. Absolutely. In Washington, DC we have this 550 square mile area of coverage and these cards are commercially available by Verizon. Again, we expect other wireless operators to add similar services down the road in due course.

Mr. UPTON. Sounds like we need to encourage southwest Michigan to get within the shaded area.

Mr. Markey.

Mr. MARKEY. Thank you. Mr. Neihardt, how much would your service cost a customer per month?

Mr. NEIHARDT. Right. this service is currently priced at $80 per month all you can eat so you can be on it all day at home, at work, take it with you. The card, I believe, is currently $150.

Mr. MARKEY. What is your goal for subscribers for your service over the next 3 years, let's say?

Mr. NEIHARDT. Oh, that is a good question. In Korea we added about 4 million subscribers in the first 1½ years of operation and we would expect hopefully to do something similar.

Mr. MARKEY. Four million?

Mr. NEIHARDT. Right.

Mr. MARKEY. In a country of, what, 30 million?

Mr. NEIHARDT. Right. Right.

Mr. MARKEY. Wow.

Mr. NEIHARDT. Again, people want to connect to their data wherever they are. We think it is a compelling technology and will be widely used.

Mr. MARKEY. Wow. Are there security features built into the technology?

Mr. NEIHARDT. Yes. By its very nature CDMA is a former military technology that was used to evade some of the jamming techniques that were used in World War II so it operates on spread

spectrum at very low power and is virtually undetectable by most spectrum analyzers. No. 1, you have the low power aspect. No. 2, CDMA code division multiple access so it is encoded. Then, of course, you are in a packetized mode so it is surveilable over the air but it takes a great deal of expertise and maybe about $50,000 worth of equipment. It is very difficult to do.

Mr. UPTON. Very difficult. Interesting.

Mr. Jachner, could you go through some of the hybrid applications again very briefly that you have, the phone cell call capacity with simultaneous data. Could you just explain that again briefly?

Mr. JACHNER. Yes. We see that as kind of the convergence in functionality. For example, in this set you can clearly see it has voice capability delivered over an IP connection. But at the same it is a data terminal. It is a light one.

Mr. UPTON. How would I see it? How would it appear to me, this simultaneous text and voice? What would that look like?

Mr. JACHNER. Well, suppose in the instance of simultaneous text and voice I may be wishing to call you and you might even recognize my name but choose not to take the call. If I could indicate that I am standing with Mr. Chairman Upton and that he wishes for all three of us to converse, that inclusion of the text as the subject of my call would perhaps guide you to differently prioritize taking my call.

The phone rings, you look at it, there is the subject of the call where we see today caller ID. We might see this is Jack and I am calling about such and such. You may still choose not to take the call but the analogy is to e-mail as if we were sending e-mail without including a subject line. That is where we are with telephony today.

Mr. MARKEY. I get it. Interesting.

Mr. Burris, how many subscribers are you targeting over the next year or 3 years because this is the Dick Tracey two-way wrist TV that I always wanted to have.

Mr. BURRIS. It certainly is.

Mr. MARKEY. What is your goal now for penetration of the market?

Mr. BURRIS. Well, because I run the wireless data business, I wish every phone that we sold was a data phone. In fact, we are getting more and more near that goal. We have now got very inexpensive data handsets for anywhere from $20 to $30 that have color screens. In fact, one or two that I passed around are these phones. I would think mid next year you could definitely see a point where Sprint's handset lineup is dominated by phones that are not only voice but data handset.

In essence, every new subscriber that takes a phone from Sprint would have a data handset as well. Some, of course, would use it a lot and others may not. Sprint today has over 20 million subscribers either direct or through our partnerships. I am not really privy to the long-term goals of that other than just growing share quite a bit.

Mr. MARKEY. And this will be a nationwide service?

Mr. BURRIS. It is.

Mr. MARKEY. The ABC feeds, whatever, would be national feeds, not local. Is that correct?

Mr. BURRIS. Right. In fact, we are really independent of that so wherever Sprint has coverage nationwide where our 1x network is covered, you can have access to all those different whether it is the audio baseball or all the TV channels. Theoretically you could have cable TV channels even if you are not a cable subscriber technically.

Mr. MARKEY. Thank you, Mr. Chairman.

Mr. UPTON. Mr. Cox.

Mr. COX. Thank you. Mr. Birnbaum, can you help me understand why it is that public utilities, let's say Southern California, Edison, where I live, haven't gotten into the broadband market?

Mr. BIRNBAUM. I think there are several reasons. Some utility companies over the last 5 or so years, basically starting in the late 1990's, did get into the communications market and it didn't fare very well for some of them so some utilities we find are a little reticent to reinvest in that marketplace.

The main reason, though, I think is basically technology. Broadband over Power Line technology, which is now commercially and technically viable, really wasn't just 3, 5, 10 years ago. Although utility companies are looking at it, and we talk to dozens of utilities all the time, they are very slow movers. They are essentially prioritizing their investment, what few dollars they do have to invest and, in fact, are looking for the enhanced utility application that I talked about.

I think over the cost of the next couple of years we will see more and more utilities get into the business either directly by investing in Broadband over Power Lines, or allowing Broadband over Power Line providers to come onto the network and actually provide services and users while at the same time providing utility applications back to the utility.

Mr. COX. Current communications hasn't received any equity funding from utilities. Is that right?

Mr. BIRNBAUM. Actually, in Ohio, where we have our first venture, it is actually a 50/50 joint venture with Cinergy Corporation.

Mr. COX. Well, that is a good sign. My hope is that we would see the utility industry put in some money into this and that it wouldn't all be left to entrepreneurs elsewhere to do this innovation and then bring it to the old line regulated companies and say, "Please come along."

Mr. BIRNBAUM. In our discussions with utilities we are seeing that regularly. Obviously they need to do that often through the unregulated side of the company. Cinergy has made its investment through the unregulated side and not the regulated utility. We have also set up a separate venture with Cinergy to actually go deploy the technology in rural cooperative areas, as well as smaller municipal-owned utilities. Cinergy is one of the more entrepreneurial minded utility companies but several others are looking at doing something similar.

Mr. COX. Mr. Neihardt and Ms. Rizzo, I wonder if you could tell me the degree to which you think that the lack of operating software that works on mobile phones has prevented convergence from happening as fast as we would like? This fall in November we are going to have palmtops that run XP, Windows XP, little palmtops

that fit in your pocket, weigh an ounce or less than a pound anyway, 12, 14 ounces, in there.

They won't be phones, though, and I think we are a long way from having—I have a Verizon instrument in my pocket. It is Samsung I-600 which holds the promise of being able to surf on the web and exchange e-mail and text messaging and so on. It doesn't do any of those things but it almost does. It does work as a phone but we are getting close. My sense is this Windows operating software on here is really clunky and awful and Microsoft is not represented on this panel so I apologize to those who might be in the audience or aren't here. I guess I've betrayed the bias in the question.

My sense is that we are being slowed down by the lack of operating software that will permit a device that I can carry in my pocket to load the same productivity applications that I use everywhere else. Not little miniature versions of them, but the very same ones. I wonder if you care to comment on that.

Mr. NEIHARDT. I will start since QUALCOMM is more on the device side. We recognize the same problem in our industry and have allocated substantial resources within our company to developing software that facilitates the use of standard applications on phones. Another thing that is happening is that the processing power that we are building into these phones is increasing very dramatically.

Mr. COX. The processes are very impressive so I know they are capable of doing the work.

Mr. NEIHARDT. Right. As we are cycling to newer and newer phones, the processing power is increasing. We are developing software that is going to, we hope, resolve some of these issues that you are seeing and we absolutely recognize that as a shortcoming in the user experience and are working to improve that.

Mr. COX. Ms. Rizzo.

Ms. RIZZO. Yes. Hi. I do not work in the wireless division so I am certainly not an expert in the area. I say that we certainly have phones and devices that work. They are palm based, that are Windows based that are proprietary and we leave it up to you, our customers, to choose and let us know what they would prefer.

Personally, from a consumer perspective, myself I actually think it is also a form factor issue that hasn't really been resolved yet about how you want to use these devices. I have a BlackBerry that is a phone but, frankly, it is not comfortable for me to use it that way. I think that has to be fixed as well by the manufacturers.

I will say that our iobi product will work on any wireless device in 2005 and it will be designed so that it isn't just a website you are browsing but it is actually an application that runs on the device and can be used adequately on that size screen.

Mr. COX. Well, thank you all. I thank the Chairman for putting this panel together. It was a very impressive presentation and I have every confidence that as long as we don't regulate and legislate improperly that all this competition is going to lead to wonderful things in the very near future.

Mr. UPTON. Mr. Wynn.

Mr. WYNN. Thank you, Mr. Chairman. I, too, have really enjoyed the presentations. I wanted to open with an announcement to my colleagues. Tech Day sponsored by CTIA and the Wireless Caucus

will be on June 2nd from 10 to 4 in the Rayburn foyer. It will be an opportunity to see more such gadgets, more excitement, and even more hands on experience. I encourage my colleagues to come out to our tech day on June 2nd.

Just a couple of low-tech questions. Mr. Birnbaum, I just need an assurance from you from the standpoint of safety your plug-in devices have been completely tested and all those issues have been resolved favorably?

Mr. BIRNBAUM. Yes, they have.

Mr. WYNN. Great. That is what I thought you would say but I just wanted to hear it.

Mr. BIRNBAUM. Again, these devices, the ones I am holding here, the power line modem that the customer uses, are UL certified. They are manufactured by the likes of Siemens, Linksys, NETGEAR, the companies that make essentially any of the other devices we all plug into.

Mr. WYNN. Subject to the same restrictions on overloading?

Mr. BIRNBAUM. Right.

Mr. WYNN. Second question, some communities in my area are moving toward underground power lines as a result of Isabel, Hurricane Isabel. Would your system work on an underground power line environment?

Mr. BIRNBAUM. Yes. Good question. We generally show the overhead pictures because they are easier to see the transformer and the way the topography works but the technology is essentially the same. Some of the safety mechanisms are different in an underground environment so the way we actually bypass a transformer is a little different but conceptionally it is the same and the consumers can get the same speeds and same services.

Mr. WYNN. Great. Mr. Burris, I believe, you had the handsets that got everybody all excited with the baseball game.

Mr. BURRIS. Right.

Mr. WYNN. Did you say that you thought that the market price would be in the neighborhood of $20?

Mr. BURRIS. Yes. In fact, these things have been on the market since late last year and currently the live TV product is $10 a month. You also buy a Sprint vision plan for unlimited data which is about $15 a month and that comes with $10 of credits which you can apply toward MobiTV so really effectively about $15 a month you can watch all the live TV you want. $15.

Mr. WYNN. Would a customer encounter subscriber fees similar to what we have experienced in cable so that the introductory rates could change dramatically over time to get access to this TV programming?

Mr. BURRIS. It is very possible. All the channels that we have today whether it is FOX sports, MSNBC, CNBC, those are all being paid for within the guidelines of that $10 of fees so today we have covered that. As we go into potentially more expensive channels like ESPN or MTV or some of those, those channels request larger payments so potentially there could be a tiered model much like the cable model where subscribers sign up for more or less a basic type of TV service and then maybe individual channels that they choose.

Mr. WYNN. If I could just follow-up on that. You right now or initially are offered this as a package? Is that correct?

Mr. BURRIS. Today what we offer is not unlike Internet service that you might buy today where you kind of buy an unlimited data plan, which we call Vision, and then you can add extra services to it. You can add MobiTV to it. You could add live music to it. You could live Baseball to it. All the channels together are truly a package. The product itself is stand-alone.

Mr. WYNN. One of the issues that we are confronted with, of course, a la carte pricing. Would that come into play with the MobiTV?

Mr. BURRIS. I'm sorry? What kind of pricing?

Mr. WYNN. A la carte pricing. Someone would say, "Look, I just want ESPN" or "I just want major league baseball." Will those options be available?

Mr. BURRIS. Yes. Very possible. In fact, we will be rolling out new services late this year that have many more channels and, in fact, are a video-on-demand type service where you can actually select different stations as well as different types of content. Imagine that you can choose CNN and then choose the actual story that you want to see, the 5-minute clip of that story. Those kind of services will lend themselves to being a la carte so you can certainly buy a package but insofar as channels are willing to do a deal with us, you can also watch channels individually so you can imagine buying just a single channel.

Mr. WYNN. Thank you very much. I relinquish the balance of my time.

Mr. UPTON. Mr. Walden.

Mr. WALDEN. Thank you, Mr. Chairman.

Mr. Birnbaum, I have some questions regarding Broadband over Power Line. I think there was an April 27th NTIA report that demonstrated some concerns about interference, especially with aircraft communications, maybe upwards of 40 kilometers within a BPL transmissionsite and 460 meters to fix stations, 75 meters to land vehicles. I hear from some of my amateur radio friends concerns about interference on some of the ham bands as well. Can you speak to those issues and how you are dealing with them and what you are finding in notching ability and all?

Mr. BIRNBAUM. Yes, I will. There has been a lot of talk. The FCC is actually now involved in a second proceeding regarding the technical aspects of BPL. It was in that context in which the NTIA study was recently published.

Let me address the ham question first, if I can. There have been a significant number of spectrum proceedings where the FCC has had to deal with opposition from the amateur radio community. The power levels at which our equipment operates, by that I mean the communications power levels, not the electricity power levels, are very, very low and under FCC rules they have to be.

As a result, the portion of the radio frequency signal that leaks off the wire is what the NTIA and the amateur radio folks are concerned about. That signal is very, very low. Engineers would tell you it is in the billionths of a watt. It dissipates very quickly, or attenuates very quickly. We actually think that the concerns of the amateur radio community, although we understand where they are

coming from, we think they are unfounded and the FCC so far as found the same thing.

With respect to current technology, in particular, we actually do notch the ham bands. It is not because we necessarily decided to do so, but the HomePlug specification decided it was easier not to use those bands than to deal with the political wranglings, if you will, that would come if they did use the ham frequencies. We actually do not transmit on any of the allocated ham radio bands.

With respect to the NTIA study, we have actually worked with both the FCC and the NTIA engineering staff for more than a year now. We are very familiar with the report. It draws generalized conclusions based upon some assumptions that we think are inaccurate. I think generally speaking NTIA has suggested BPL should go forward, can go forward. I know Mr. Gallagher has many a very strong proponent of the technology.

As a result, we think in continuing to work with NTIA we were able to demonstrate that Broadband over Power Line, not just the current version but any other technology, really doesn't pose the hazards that NTIA has raised. They have raised them as issues, I think, yet still propose that the technology move forward with certain abilities to notch frequencies if interference does occur, all which we would support.

Mr. WALDEN. When you talk about the interference or missions attenuate rather rapidly, how far away from the power line itself on average——

Mr. BIRNBAUM. Good question. There is some disagreement on that. We know that our emissions are literally undetectable, just tens of meters away. In fact, when anyone has ever come to do system testing of current system, that includes the FCC staff and the NTIA staff, they each have called us and said, "We need you to turn your system on because we can't measure the signal with our spectrum analyzer." We, of course, told them, "It is on. Let us come show you how low the signal is and what you have to look for." there are a number of emissions out there, or licensed transmissions, and when you go out with a spectrum analyzer, it doesn't tell you that one is from my BPL system or one is from a cellular system or from any other transmitter. It takes a while to really understand the interference potential of these signals.

Mr. WALDEN. I understand that. I guess the issue is I believe you probably can technically notch around some of these frequencies and we can deal with some of these. My concern would be that it gets rolled out before that gets addressed and then how do you deal with the Section 315 issues on interference and all of that?

I think the technology holds great promise, especially to bring broadband into rural communities. I noticed on, I think, it was the Verizon map of the country and the covered areas. My district in Oregon was what wasn't covered which is about three-quarters of the land mass of the state. We will look forward to that getting rolled out further.

I just want to make sure that these issues do get addressed technically so that we don't have interference, especially in mobile communications as well because that is one of the concerns I have heard about, too, is that if you are driving underneath these power lines, you can see some splatter on a spectrum analyzer when the

broadband is turned on. Now, that may be old, too. You may all have dealt with that.

Mr. BIRNBAUM. And there is a significant history of, unfortunately, accurate information then that is no longer accurate today. The technology that people were working with 5, 6, 7 years ago is not that which is being deployed today. These new protocols such as OFDM, which is an easier way to notch frequencies rather than using, for instance, spread spectrum which will broadcast over a swatch of spectrum. We can actually dedicate which carriers would operate or not operate at a given time and given location.

Mr. WALDEN. Are all of the broadband providers using the same type of equipment you are talking about today? I was under the impression there wouldn't be one at every transformer on every pole, that there is another way to do it absent that.

Mr. BIRNBAUM. There are two or three ways that companies are actually trying to provide Broadband over Power Lines. Ours essentially we bypass the transformer. We think technically and economically it is the most efficient cost-effective way to do it. Another approach is to literally send a signal through that transformer which is not designed to let an RF signal go through it so there is some technology involved in trying to get that signal through.

That would also require actually more equipment, not just on every transformer pole but virtually on every pole. The third approach, I think, maybe is what you have heard about and that is taking the signal off the wires that run down the street and sending them to homes and businesses using wireless technologies.

That, in theory, wouldn't need to be on every pole certainly, although it depends on how far WiFi signal, if you are using WiFi, would travel. There are some limitations on that technology. WiFi wasn't designed to go very far, to penetrate through buildings and walls and trees and things of that nature. But there are various flavors all of which are substantially similar in that they send the signal over the power lines.

Mr. WALDEN. All right. Thank you. Thank you, Mr. Chairman.

Mr. UPTON. Mr. Gonzalez.

Mr. GONZALEZ. Thank you very much, Mr. Chairman. I am going to try to keep it simple because my understanding is rather simplistic. Will you attempt to regulate, of course, what goes on with technology which will determine just how far you are going to go with the technology? Seldom do we really understand it and I love your presentation but, to be real honest with you, I still have problems conceptually so please forgive me.

The question is to Mr. Birnbaum. Years ago, I thought it was just a stroke of genius, I had this little attachment. Stick it to the stereo, take these two portable speakers into the bedroom, stick it into the outlet and I had speakers in the bedroom. I just thought that was absolute genius. I don't know what happened to all that technology.

I guess people now just buy different stereos. I never did that. But I understand the concept. What you are saying we have now, Broadband over Power Lines, is really you have an infrastructure or delivery system already existing in every building in the United States whether it is—we weren't able to get cable in downtown San Antonio for a long time in our commercial buildings.

We have it so we should take advantage of it is what you are saying. You have the technology when it comes to broadband to deliver it. My question goes beyond that. I just moved into an apartment. I wanted certain telephone and fax capability. It meant the technician had to come in and put all the different jacks in the different rooms. Right?

Time Warner had to come out and put in another connection, whatever it was, in the living room and that ran into a lot of problems because they had to go under the apartment and such. My question is is this delivery system, this power line, right now you say Broadband over Power Line. In the future is everything over power lines?

Mr. BIRNBAUM. I think the answer is yes. All the technologies we're talking about, to an extent, are using Internet protocol. All we are doing is sending packets whether the packets contain video voice or data. Most of our devices don't really care which one they are. The only thing that matters is from where they came and to what network are they getting sent.

One of the advantages of using the power lines is since they are ubiquitous in every room of every house, every office, subject to what is behind the walls you can send the signal to whatever room you want without rewiring or needing to pull category five wiring, for instance, throughout the house which can cost, in some cases, hundreds or thousands of dollars.

All you need to do is take two of these modems, plug one in room A and one in room B and now both computers can talk to one another over electricity wires or they can share an existing printer. The modem technology was actually designed for local area networking to use those electricity wires in the home or office. What we have currently done is extended that out to the Internet, out to the broadband world so you can now actually communicate outside the home or office but, again, using the same electricity wires.

Mr. GONZALEZ. I think there is still a few minutes so if anyone else on the panel wishes to address basically, again, conceptually what it means to your particular industry, are you free to do that. Thank you very much.

Mr. UPTON. Anybody else want to answer on the panel? Does the gentleman yield back? Mr. Bass.

Mr. BASS. Thank you, Mr. Chairman. I was gong to ask just one question and that was what action could this committee take or regulatory agent or the Congress take in the arena of your own technological research that would scare you the most?

I decided to turn it around and make it a little more positive and say in the course of our debate and deliberations over telecomm reauthorization and the whole issue of telecommunication, what action could this subcommittee take that you would be the most pleased with as it relates to your own sphere of research and development? It is my only question and I would like each one of you to address that if you would beginning with you, sir.

Mr. BIRNBAUM. Yes. Thank you. I guess there are two issues that could help sphere certainly the technology that Current is developing. One is from a financing perspective a number of utilities companies—Mr. Cox asked about why aren't some of them involved more in the communications industry. Much of it is because they

don't have the capital. There aren't tax credits or other types of financial incentives.

I don't think these need to be tied necessarily to broadband, particularly in the case of utilities and centers for them to develop technology that improves the electricity grid are significant and many states actually have some programs along those lines so something that actually gives incentives. Not subsidizes but gives some incentives for utility companies to join in the broadband game.

There are thousands of utility companies and even the largest utility company only serves about 4 million customers and, although a lot, it pales by comparison to the telephone companies, for instance. They don't see the same financial windfall necessarily to advance the technologies and deploy them like cable and telephone companies.

I guess one other clarification is the FCC has been struggling with how to deal under the existing framework of the 1996 Telecommunications Act with these different types of services. Are they telecommunications services? Are they information service? If you live in the 9th Circuit, it is a different answer right now than if you live somewhere else in the country, some clarification from the Congress on how actually different types of broadband services are to be treated.

I think most of us here would prefer that they be treated with more of a deregulatory touch than a regulatory touch. I think that might also help spearhead some of the deployment. We do get questions from utility companies from time to time that if I deploy it, particularly if I am in one state or another, how am I going to get regulated by the state utility commission and what is the FCC going to do?

Mr. BURRIS. My role at Sprint is pretty straightforward. I am supposed to just build the best data services business I can within the confines of current laws and regulations so I am not really prepared to discuss anything we may like to see changed or stay in place.

I would just to defer to Bill Barloon and Bill O'Neill here in our DC office that would probably love to follow up on some of those points. Thanks.

Mr. JACHNER. I likewise am a technology person in our research labs but we do have our people working in Washington that I think are going to be communicating our positions going forward. Thank you.

Mr. LEDDY. Well, I won't completely pass on this one. I am a technologist but we spend capital like there is no tomorrow in our group. As I said earlier, the cable industry spent $85 billion upgrading its network and purchasing new consumer premises equipment since 1996. It is a very capital intensive industry. We need to borrow a lot of money to keep the cable industry moving and lenders like a stable regulatory environment.

I think the spirit of the 1996 Act was a very good spirit. It essentially had a deregulatory flavor to it trying to create deregulating the entire environment and promoting facilities based competition. I think we all want parity between industries, parity in the marketplace. We would like to see that achieved by deregulating indus-

tries down to parity rather than regulating industries up to maybe levels of parity where old regulations exist. In general, a deregulatory environment and one that favors facilities-based competition.

Mr. NEIHARDT. Well said. I am going to make the same point in a little bit different way which is to say that within the last year I heard a speech by a senior official at a local telephone company who said that more of the calls that are terminated on her network are now coming from wireless phones than from wireline phones. Similarly in 2004 they predict that the number of wireless minutes are going to exceed the number of wireline minutes for voice.

We believe you can take that a step further to say that in the future the wireless Internet is going to be more pervasive and carry more traffic than the wireline Internet in terms of getting data out to the users. With that as context, I would say maintain the strict policy technology neutrality that this country as made a cornerstone of its telecommunications policy and don't subsidize obsolete technologies as things move to their natural—as traffic that should be wireless moves to its natural wireless state in terms of the economic drivers for that.

Ms. RIZZO. Okay. I work in a product innovation group so certainly policy is not my area of expertise but I will tell you that what gets us excited is the ability to come up with new products and new ideas and get them to market as quickly as quickly as possible to test whether our customers actually want those.

We are extremely excited by this space. It is a very innovative dynamic area for us and I think for everyone here on this panel. What we would argue is that the wireless model has worked quite well in generating a lot of competition and product innovation and we would hope that we have something similar to that.

Mr. BASS. Thank you, Mr. Chairman. I would say that it might be appropriate to have a follow-up hearing from the policy side as to how these technologies can be best developed as we debate telecomm.

Mr. UPTON. Mr. Davis.

Mr. DAVIS. Thank you, Mr. Chairman. Thanks for holding this hearing. I am sorry I couldn't get myself here sooner.

Mr. Birnbaum, you may have already covered these points and if you just say so, I will go back and read your testimony later. I am very intrigued by what I heard you say today. Is there anything you would like to say further that you haven't about what are the—well, my question is really how far and how fast for you and other investor-owned utilities or I suppose it could apply to municipal-owned utilities and others as well. Perhaps even rural cooperatives.

What would you say we can expect to see in your industry and what are some of the other obstacles or potential incentives that need to be addressed to allow you to become a competitor on a level playing field?

Mr. BIRNBAUM. Taking the first part. I think what we will see from utility companies—most of the folks in my company actually come from the communications industry and what we have learned about utilities is they tend to take to new technologies fairly slowly. We have been fortunate enough to work with some utilities that are moving more quickly than others.

I think that over the next year or 2 you will see many more utilities start to deploy. We are in discussions right now and I think by the end of this year we will have additional commercial deployments going forward with our technology. I think as more utilities see other utilities of their same type whether they be investor-owned, municipal-owned, or cooperative, or whatever area of the country, I think more and more utilities will get more comfortable.

The technology is very new so we understand why they are taking a while to adopt it. I think the biggest issue for utility companies is what is the incentive for them to do that. If they are going to invest in this new technology and have no upside because any upside has to just go, for instance, to their electricity rate base. Several utility companies look at it and say, "I don't really want to make an investment in broadband and, therefore, what is in it for me?" As I mentioned earlier, utility commissions in some cases are as or more interested in getting this technology deployed in their areas than the utilities are because they want their customers to be able to do time-of-day pricing so they can use their dishwasher when it makes more sense to do and so that outage detection and restoration detection, which was a big issue here after Hurricane Isabel.

I myself live just outside the beltway and have had three power outages in the last 6 weeks, none of which lasted too long but they all would have been much more quickly resolved if the utility company had automated outage detection restoration capabilities.

Mr. DAVIS. So are the utilities making capital investments now to facilitate the services that are more directly related to providing electricity like you just mentioned in a manner that is being regulated under rate of return and financed by the rate payers, etc.?

Mr. BIRNBAUM. It is regulated in that manner. Utilities have put some R&D dollars to work for the enhanced utility applications. A small handful are actually trying to go deploy technology. One of the problems is although once our equipment for Broadband over Power Lines is, in fact, on the wires, we can provide all those services, the utility company still needs a meter that is capable of being read essentially an IP-enable meter.

They need a different meter on each house. They would need their switching equipment to also be capable of being remote-controlled over the electricity wires. There are a number of different industry segments that need to come together and we are literally working with them as we speak in trying to get some of the other end user or utility company devices to collaborate with the technology.

Mr. DAVIS. I would like to ask—I think there is somebody here from Verizon as well as others. What general comments you have on the electric utilities as a competitor and their entry into the marketplace here. I recognize you didn't come here today to talk policy.

Ms. RIZZO. Give me 1 second.

Mr. DAVIS. And really it is the same questions for others but I thought you were a good one to start with.

Ms. RIZZO. Clearly I am not the right person to answer that. I mean, for us, certainly from a product perspective, we see it as just another platform for our products to run on but from a policy per-

spective, I can't really comment on that but we can certainly get back to you on that.

Mr. DAVIS. Sure. Anyone else care to offer some general observations on the entry of the electric utility industry as a competitor here as far as delivery of service?

Mr. LEDDY. I don't think we know what it is yet. We will be competing with Mr. Birnbaum, I guess, in Cincinnati shortly but I am not sure how video, voice, and data can really be delivered over a pipe with such a narrow bandwidth. I don't know what the pricing is so we will have to see what the offering is.

Mr. DAVIS. Let me just close by saying that I want to thank you all for coming and showing your stuff and it is my loss that I wasn't here earlier. I think you will find a lot of Members of Congress will be really interested in you all helping us walk through this.

Mr. Chairman, I think this is one of the youngest panels we've had here and that is not a coincidence. Thanks again.

Mr. UPTON. Mr. Stearns.

Mr. STEARNS. Thank you, Mr. Chairman. Mr. Leddy, how is Time Warner able to incorporate enhanced 911 into its VoIP product?

Mr. LEDDY. Our VoIP product, unlike some others that you may be familiar with, is supported by our CLEC partners MCI and Sprint so the last mile is our plant but we partner with CLECs that have 911 services for that part of the offering. We have a very complete replacement service available to our customers. It includes all of the services that you would expect from a phone company, 911 service, director listings, 411 service.

It supports all CALEA requirements from the Government. It also uses all the customer's existing facilities in his home. You get one of these little gadgets from us which is a telephone modem, the combination of a high-speed data modem and a telephone modem, and plug this into any socket in the wall, any existing phone jack in your house. You now have VoIP throughout the house.

You use your existing phones, your existing jacks. You can port your existing telephone number over to our service and 85 percent of our customers take their phone number with them. Unlike Avantage or some of the other CIP-based VoIP services that you may know about, ours is a more complete service.

Mr. STEARNS. How does law enforcement get access to call identifying information and call content in response to lawful requests?

Mr. LEDDY. I don't know the specific answer to that, sir. I can get it for you but we are CALEA compliant.

Mr. STEARNS. I mean, you are compliant but you don't know how the law enforcement gets access to it then?

Mr. LEDDY. I don't, sir, but I am not in charge of our phone business. I can get you an answer on that.

Mr. STEARNS. It might be helpful, Mr. Chairman, if you could. You know, I think the hearing, Mr. Chairman, is about what can we do to get broadband so stimulated that everybody wants it. I think a lot of the questions are going to how we make it easier and is there one single application that would push everybody over to get broadband whether it is going to be from utilities or different other cable or so forth.

I think just a general question for the panel. Is there anything Congress should do to help this along or should be stay out of the mix? Maybe just start from my left to my right and go right across. Is there anything that Congress right now in your opinion should be doing to make it so that consumers would have easy access to broadband in multiple competitive ways? Just a short answer. Maybe the answer is no.

Mr. BIRNBAUM. I think there probably are some things, as I mentioned earlier. You may have stepped out. There are some clarifications that probably could help in the way the FCC is trying to clarify certain things under the Act.

Mr. STEARNS. Okay. Mr. Burris. Maybe all of you have already said this, too.

Mr. BURRIS. I will just pass on that. I don't run or am not that involved in our broadband business at Sprint. Mr. Barloon and Mr. O'Neill are.

Mr. STEARNS. Okay.

Mr. JACHNER. My focus is the enterprise. I guess in that space I just would like to see an open competitive environment and a level play field for all the players, as probably others do, in their parts of the space.

Mr. LEDDY. I think for cable it is a one-ward answer, certainty. We need a stable environment that we can count on.

Mr. NEIHARDT. I would say on the technology that we demoed here today broadband over the commercial cellular infrastructure, we took these actions without any help or activity from the Government and we did it in existing spectrum so we didn't need to go back to the Government and ask for new spectrum. I think over time we expect a level of usage that will need to involve new spectrum.

Mr. STEARNS. So you would like to see the new spectrum finalized?

Mr. NEIHARDT. Indeed. That would be helpful.

Mr. STEARNS. That would be very helpful. Ms. Rizzo?

Ms. RIZZO. Yes. Well, I think have you have seen here today that this is already a dynamic, competitive, and innovative space and we would like to keep that going. We really favor something similar to the wireless model that is not heavily regulated and broadband providers are all treated equally.

Mr. STEARNS. My last question, I guess, goes to Birnbaum, I guess, deal with the utility companies. You know, in Florida we have lots of hurricanes and a lot of times the electricity goes out but the phone was always on because you have that telephone network that has reliability. But my electricity is always gone. I mean, in the summer time it is always gone every 2 or 3 weeks. A storm will come up and it is gone. That would be such a hassle that I wouldn't think I would go on the utilities so what kind of reliability can you provide?

Mr. BIRNBAUM. As long as the electricity system is up, so will be broadband system be up. We can actually operate independent of the electricity so we don't need the electricity to flow in order to provide the broadband signal. However, these devices, much like your DSL or cable modem, do need electricity to operate so although your phone would work——

Mr. STEARNS. Like the one that Time Warner mentioned, too. That is going to go out, too.

Mr. BIRNBAUM. I suspect. Now, you can build these devices and I think that device may actually have some backup battery life in there. Last time we had a blackout, which was in my neighborhood just a few weeks ago, I literally was working on my computer by candlelight. I couldn't get access to the Internet because the cable modem system which I had in my house didn't work.

Mr. STEARNS. So your cable modem did not go out even though the electricity went out?

Mr. BIRNBAUM. No, the cable modem did go out.

Mr. STEARNS. Okay. How did you get on the Internet?

Mr. BIRNBAUM. I couldn't. I could turn on my computer, use it by candlelight because it had a battery, but only for the 3 hours that the battery life was there I could use the computer, but I couldn't get access to any broadband network. I think that would probably be the case with any of the three widely available technologies, or at least DSL cable and now power line. Although conceptually we can provide the service without backup power, most of the end user devices do require it.

Mr. STEARNS. You know, I can go on my computer using my cell phone and I just put my cell phone in my computer. It is not broadband obviously but it is very effective in the sense that at least if everything is gone, I can still use it.

Thank you, Mr. Chairman.

Mr. UPTON. Mr. Shimkus.

Mr. SHIMKUS. Thank you, Mr. Chairman. This has been a great hearing. I am a post-1996 Telecomm Act member. I think the basic premise, though, of the Telecomm Act was competition within the pipes. What we have seen evolve since then is really competition between the pipes. This is a perfect example of that. That is why I think you need a competitive market. You need to be technologically neutral.

I answer to my friend from Florida, consumers will decide. When there is a head-to-head competition in Ohio, they will decide. If there is a weaker opponent, they will then have to produce the technology to try to compete on an equal footing. I think that is really what makes America great and I am excited to see this.

Also, the convergence issue. I am in a rural district. Congressman Walden's comments are really appropo. We have rural electric coops and we have rural telephone coops. There may be competition now in between the rural electric coop who is somewhat subsidized but it has incentivized the rural electric coops to do those farmhouses that may be 15 miles down the road. Obviously it doesn't have the same market condition. There needs to be some incentivization by us to make sure that rural America is electrified. I think when we get to the broadband debate and this whole thing, that is going to be part of the discussion.

My Congressman, Congressman Stearns, mentioned Voice-over-Internet Protocol. Anna Eshoo and I obviously have been very involved in enhanced 911. For those who want to talk about enhanced 911, especially enhanced 911 with Voice-over-Internet Protocol, what we are being told is that there is actually a chance for more information to be received by the emergency responders be-

cause of the multitude of information that may be on, in essence, the data base from someone who calls. Are we getting the straight story on that or is there more technological hurdles?

What we would like to see and we passed in the House, and I am optimistic the Senate will pass something. If they can pass anything, they should be able to pass enhanced 911, that will say we really want to identify the location of the individuals who call so we are dealing with Verizon and cellular companies, too.

We want to know where they are at and that is the whole premise of enhanced 911. There are a lot of partners in this and I am talking to the technology people. You always see the incumbent local exchanges, the 911 call centers or the PSAPs. It is the cell companies. What do you see on enhanced 911 and the challenges of Voice-over-Internet Protocol? Why don't we just go down through the panel. Mr. Birnbaum, if you will begin.

Mr. BIRNBAUM. I will be brief. Perhaps ours is the easiest because we haven't started offering the commercial VoIP services yet. We start doing that in the next month or 2. Like Mr. Leddy from Time Warner, what we are doing is working with backbone VoIP providers that can actually provide E911 today. Their technology or their sort of IP capabilities applied over our pipes or our broadband network actually will enable us to provide E911 data back to the PSAP.

Mr. SHIMKUS. Great. Mr. Burris.

Mr. BURRIS. Yes. Thank you. Again, I apologize. I am not involved with Sprint's 911 services other than just high-level understanding of our compliance from a wireless perspective. Of course, our wireline services, even some of the ones that support Time Warner Cable, are certainly compliant.

Mr. SHIMKUS. The former CEO personally told me the story of how Sprint had identified someone who is, in essence, kidnapped and they were able to follow the cell towers and they asked the lady who was in the trunk of the car to pull out the plug of the rear-view light so the police could identify the car. I know Sprint has a long history in at least pushing and understanding the need for this.

Mr. BURRIS. And that is true. Even today we have had stories of subscribers who have taken pictures or videos of cars and license plates, potential scary people, and sent those back to authorities or used those to actually capture people. Insofar as you can envision a future where E911 type services are tied into the capability of a handset, it gets very rich in the kind of information that can be sent back to authorities.

Mr. SHIMKUS. Alcatel.

Mr. JACHNER. As VoIP is deployed, we remain compliant with E911. Within the enterprise there is a number of ways of doing it. From a technology point of view there is no reason it is not doable. At the end of the day what we have is an infrastructure where there are wires coming to the end device supported by a switch. Today E911 is deployed over the telephony infrastructure. As that infrastructure is now evolving to be a data or converged infrastructure, there is fundamentally no reason.

The switch needs to notify which physical wire is being used for a particular conversation. There are some evolving proprietary and

standard-based solutions. Perhaps that wasn't originally conceived of when the Internet was designed and maybe we are just playing catchup here. In the interim there is a number of solutions that I can envisage. Some might be end user based. I am not addressing mobile.

I am addressing a fixed VoIP phone that you can plug in anywhere in the building and it would work. You could have the user not be able to use the device until he has responded to some questions like user name, password, location. It is upon this location that would be stored in the data base and made available if that device was ever used for an emergency call.

It does shift the responsibility to the end user. Another solution might be to limit this ability to roam with your terminal device so that you can plug in anywhere and it will work but only within the square feet defined by the regulation of E911 and then post those limits on the data network that underlies it. You are a LAN, Local Area Network, but it is only there and that is where it would work. Or specifically you get an IP address associated with a restrictive physical area so the association of the port you have plugged into and the location would be satisfactory to the current laws of first responders finding you.

Mr. LEDDY. I shouldn't guess on the answer here. All I should say is we understand how important E911 and CALEA compliance is in this era where national security and safety are such a concern in America. It is fully our intention to be E911 compliance and CALEA compliant. We think we are with Sprint and MCI.

To your specific question, though, whether Voice-over-IP actually gives you greater possibility for 911, I don't know but we will get you an answer back on that.

Mr. NEIHARDT. As you know, Congressman, QUALCOMM has been very much involved in the deployment of a handset base solution and deploying a GPS measurement capability in cell phones. That has been a very successful aspect of this whole 911 program with Sprint and Verizon here on the panel. I would say at this point virtually all of the phones that they are selling now, the newly activated phones, have this capability resident in the phone so that has been successful.

That has been possible because of Moore's law. As we have been able to ramp up production of these chips and burn the measurement capability to the silicon in mass quantities, we have been able to drive the parts cost of E911 for cell phones down to under $1 per phone.

I think that the positions taken already by the National Public Safety Organizations are instructive in this matter in that what they are saying is that if a device, and it could be this device or PDA, the device that is used for Voice-over-IP, if that device acts like a telephone and you make 911 calls on that phone, that device should be position locatable. That is a blanket statement that would apply to all devices.

We think that makes sense because if I am taking this device with my EV-DO card and I am wondering around here in the DC area, which I do almost every day, and I make a Voice-over-IP call, or I am making calls and something bad happens or someone tries to hit me with a lead pipe or something and I call 911, I am not

locatable by any technology at this time. I might think that I am when I am calling for help but, in fact, I am not. We have been successful on the hardware side through mass production in driving down cost of 911 through GPS measuring capabilities in phones and I would argue that is a good way to do it in other devices that are VoIP capable.

Ms. RIZZO. I am not going to venture an answer in this area because I don't want to run the risk of telling you the wrong thing but we will get back to you on that.

Mr. UPTON. Well, thank you very much, panel. We appreciate looking at the gadgets. We look forward to having them in our homes soon. My wife actually stopped by a little earlier so it will be on the honey-do list, I know. I thank you for your testimony. As it turns out, I think we are going to be having votes literally within a minute or 2 so the timing was perfect. We appreciate your attendance with us today. Thank you.

[Whereupon, at 1:11 p.m. the subcommittee was adjourned.]