

2004 PURC Fall Roundtable

Is the Tail Wagging the Dog in Communications Policy?

Making communications policy in the U.S. has become dangerous work. Many issues, such as network unbundling and service subsidies, seem like zero sum games and any “loser” on a particular policy decision has an incentive to fight back through whatever political, regulatory, or litigation means might be available. What makes matters worse is the lack of a clear direction in communications policy for the U.S. Are we looking to market forces to shape our communications future? Are we pursuing specific infrastructure goals, such as broadband targets or services to specific groups? Are we being driven by stakeholder interests? Are we instead ensnared in a Gordian knot of multiple drivers: market forces, industrial policy, and stakeholder preferences?

How are regulators and policy makers to make decisions in such a highly charged environment in which priorities are unclear? I doubt that any one person or group can really say – there doesn’t appear to be a magic bullet, a brilliant idea that satisfies all stakeholders. Nor does it seem that anyone should simply overpower and silence the losers in a policy debate. The most promising approach seems to be for individuals and groups to exercise leadership by: raising tough questions for open (and heated) discussion, setting out tasks and other work for stakeholders to work through conflicts, and identifying objectives.

Practicing such leadership was PURC’s objective with this Roundtable, which we hope is the first of many. We asked our speakers and other participants to engage in a lively exchange of ideas on the forces shaping the rapidly changing communications sector in Florida, the nation, and the world, and on the desired outcomes for this rapidly transforming sector. We hoped that some consensus would emerge on themes and important issues for future deliberations. I am happy to report that our participants accomplished that objective and more.

This report provides the highlights of this Roundtable. Here you will find an Introduction that summarizes our purpose and outcome, the Roundtable agenda, an abbreviated transcript of our keynote speaker’s presentation, summaries of our panel presentations, and outlines of the themes and issues that emerged from the dialogue. We at PURC hope that you find this report useful, and we look forward to your participation at future roundtables.

Mark A. Jamison
Director, PURC
November 2004

Introduction

Since the divestiture of AT&T in January, 1984, the telecommunications industry in the United States has traversed the rocky road toward increased competition and technological innovation. At the same time, policymakers have struggled to integrate the objective of universal service into this evolving landscape, thus raising the questions: Is the Tail Wagging the Dog in communications policy? What exactly is that dog and how should we characterize our nation's communications policy? Has that policy effectively balanced the three objectives of competitive services, technological innovation, and universal service? And how similar are our efforts in balancing those objectives to those of our counterparts in other developed countries?

The Public Utility Research Center (PURC) is uniquely positioned to provide this forum for deliberation among various stakeholders because of its vast experience in international training and strategic research in public utility regulation, market rules, and infrastructure management. Since 1997, the PURC/World Bank International Training Program in Utility Regulation and Strategy has trained 1,300 participants from 123 nations. Over 20 percent of those participants attended the program's telecommunications sessions exclusively. In addition, PURC researchers have published numerous articles on telecommunications, energy, and water concerning incentive regulation, utility pricing, benchmarking, investor perspectives, and market reform.

Agenda

8:30 – 8:45 a.m.

Welcoming Address “Making Communications Policy is Dangerous Work”
Dr. Mark A. Jamison, Director, PURC, University of Florida

Welcome
Mr. John Marks, Mayor of Tallahassee

8:45 – 9:45 a.m.

“Real Competition & Real Regulation: Lessons from Europe”
Professor Martin Cave, University of Warwick
Director of the Centre for Management under Regulation at Warwick Business School. Dr. Cave is also an advisor to OFTEL and a number of other regulatory agencies and was a member of the Competition Commission from 1996 to 2002.

Break

10 – 11:30 a.m.

Roundtable Discussion: Competition and Innovation in Florida
What is the state of the communications industry in Florida? How does Florida compare to other states and to areas outside the United States in terms of availability of competitive communications services? How

does the communications industry affect the Florida economy? What are the important public policy issues that could promote or impede more competitive services and greater technological innovation in the future?

Moderator: **Dr. William Lehr**, Massachusetts Institute of Technology

Panelists:

- **Michael Gross**, Florida Cable Telecommunications Assoc.
- **Ed Hoffman**, Gainesville Regional Utilities
- **Gary Sanchez**, Cingular Wireless
- **Marshall Criser III**, BellSouth Telecommunications, Inc.
- **George Ford**, Applied Economics Studies

Lunch

12:45 – 2:15 p.m.

Roundtable Discussion: Access to New Technologies and Services in Florida

What is the state of access to advanced communications for residents in rural areas, for the elderly and disadvantaged, and for schools and libraries in Florida? What are the effects of competition on these groups? What is happening with the traditional financial support systems to make communications services more affordable for and more accessible to these groups?

Moderator: **Professor Johannes Bauer**, Michigan State University

Panelists:

- **Tom McCabe**, TDSTelecom
- **Lloyd Tribbley**, Governor's Working Group on the Americans with Disabilities Act
- **Coralette Hannon**, AARP
- **Kay Young**, Florida Learning Alliance
- **Charlie Beck**, Florida Office of Public Counsel

Break

2:45 - 4:30 p.m.

Synthesis of the Program: Policy Implications for Floridians.

What were the important issues raised? What were the key insights? What are the policy issues warranting further discussion for Floridians?

Moderator: **Dr. Mark Jamison**, PURC

Discussant: **Professor Martin Cave**

Adjourn

Telecommunications Roundtable Report
September 29, 2004

Introduction by Dr. Mark Jamison, Director, Public Utility Research Center

Over the past year, we at PURC have been talking to people about what frustrates them the most about communications policies in Florida and the nation. A common theme that we heard was that our communication policies often seem to lack direction. People would ask: Are we looking for market forces to determine our direction, or do we have particular infrastructure goals, such as specific broadband penetration or Wi-Fi penetration? Are we stakeholder driven? Or worse yet, are we in a Gordian knot, where these different forces conflict and keep us from making progress by any measure?

In response to this concern, PURC developed this policy roundtable to facilitate a dialogue about the status of communications services and communications policy in Florida, and where we should go. We at PURC believe such a dialogue is important because changing communications policy in the U.S. is hard. This is true in part because after the breakup of AT&T, we set up a system of policies in which we have drawn bright lines between what's old and what's new, what's voice and what's not voice, what's subject to traditional regulation and what's effectively unregulated. Then, we hard-wired these policies into regulatory institutions, accounting practices, and laws so that we cannot make policy changes without reforming institutions, affecting numerous companies' bottom lines, and obtaining approval from numerous governmental bodies.

These observations bring me to the question we want to discuss at this particular forum: What is driving and what should be driving our communications policies?

Greeting from Mr. John Marks, Mayor of Tallahassee, FL

I want to take this opportunity to welcome those of you from out of town to the city of Tallahassee. To those of you who are from Tallahassee, I know that in light of the recent hurricanes, you are pretty glad that you are here.

This forum is of great interest to me because I've been involved in utility regulation for quite a while. I was a member of the Florida Public Service Commission (FPSC) for about eight years and before serving in that capacity, I was a hearing officer/administrative law judge. After I left the Commission, I went into private practice. And I still work in private practice in the utility regulatory arena.

It is very interesting to see how telecommunications has evolved over the years. I can recall asking when we went through the divestiture of AT&T in the early 1980s, "Why are we breaking up what is considered to be (at that time) the best telecommunications system in the entire world?" And I asked that question many times and was very skeptical as a regulator about what we were doing and why we were doing it, because our telecommunications system was the best in the world. Finally the answer came to me that we are a nation that cherishes competition. And we believe that the competitive model works much better than a regulatory model. I used to say as a regulator that if I could regulate myself out of a job, I would probably be doing the best thing that I could for the people of Florida and the nation. I believe that the competitive model of goods and services is much better, when it's done correctly, than four or five individuals at a desk trying to make those determinations. So with that in mind, I embraced the deregulation of the telecommunications industry. The visionaries who were fundamentally behind deregulating the telecommunications industry understood that by allowing competition, they could make that great system of telecommunications even better. I absolutely believe that the industry has become better as a result of deregulation and the introduction of competition. So, with those observations, I welcome you to the city of Tallahassee to continue this dialogue.

Dr. Jamison introduced Dr. Martin Cave, Director of the Centre for Management under Regulation, Warwick Business School, University of Warwick, who was the Roundtable's keynote speaker. Below is a truncated and edited version of his remarks.

Real Competition and Real Regulation: Lessons from Europe

Dr. Martin Cave

The European Union has recently been enlarged; it now has 25 members and 450 million people. Winston Churchill once said that Great Britain and the United States were divided by a common language but within the European Union we are divided by about 15 or 16 different languages. So, as you can imagine, communications at the federal level becomes fairly complicated. The EU stretches to Portugal in the west and to Cyprus in the east. It also extends from Greece in the south to Finland in the north. So what I'm really trying to present to you is a huge range of different experiences. In such a large and diverse community, how do you introduce competition? How do you control the dominance of the major operators? How do you ensure that citizens of Europe gain access to new services? In Europe, communications information technologies are really considered central to the so-called Lisbon program that our political leaders established in 2000. This program was designed to enable the EU to catch up with the United States by the year 2010. Although it doesn't look as if this is going to happen, it's certainly a very interesting aspiration.

The EU is facing the same kind of problems as the United States in advancing competition and new technologies. Some regions in the EU have experienced greater technological developments and competition than other regions. For certain key applications, particularly in broadband, regulatory policy and government policy should interact to ensure that we move forward.

Brief History of Telecommunications Regulation in the EU

Europe's telecommunications industry was in public ownership until about twenty years ago for the U.K., and until about ten years ago for much of the rest of Europe. That fact still has an impact upon the way telecommunications policy is made. For example, only in the past month has the French government's share of the major telecommunications operator fallen below 50 percent. Developing competition in an industry in which the government is the major shareholder is extraordinarily difficult. Shifting the telecommunications operator's assets to private ownership from public ownership is critical. It is a task that has nearly been completed.

Competition began a bit later in Europe than in the United States. In the early 1980s under the guidance of our former Prime Minister Thatcher, a few telecommunications operators were privatized and subjected to competition in the UK. A few other countries, particularly Finland and Sweden, followed suit. However, in the 1980's and throughout most of the 1990's, the focus was still in maintaining the historic monopolist as the engine of growth in the telecommunications sector in Germany, France, Italy, and Spain. Fortunately, that mindset came to an end in the late 1990's when the political leadership in Europe was finally convinced that the industry was so central to economic development; simply relying upon starchy, unimaginative publicly-owned monopolies would hamper economic growth in the region. So liberalization became mandatory in 1998, and those policies were revised in 2003. I only wish that our policymakers would be willing to take a similar approach toward some of our other industries, such as the energy industry which is still very non-competitive.

Diversity of EU Members—Context for Understanding Telecommunications Penetration and Take-up Rates

The European Union includes countries that range in population from 90 million to only 60,000 and from per capita income that is five to eight times greater in Germany than in Latvia. Broadly speaking, in the western part of the EU, excluding eastern European countries, there is a very high penetration rate of fixed telecommunications; the universal service policy of ensuring that everybody is connected has succeeded. However, that hasn't happened in Eastern Europe; basic telephone service — voice connectivity — is not delivered there through fixed networks but through mobile networks. The vast majority of EU citizens will have access to phone systems; by American standards, however, the prices are very high, there is no unmetered service. Each call costs something and therefore usage rates are very low.

There is, however, a very high take-up rate of mobile telecommunications. Almost everybody has a mobile handset. We've gotten to the stage now that in a Kindergarten class with kids of age 5 or 6, the teacher has to make the announcement, "Before I start, would you please make sure your mobile phones are switched off." Special phones are being created for very young people and very old people. We're talking about astonishingly high levels of penetration despite the fact that calling mobiles and calling between mobiles (mobile-to-mobile calls) are very expensive in Europe. People are willing to spend a really surprising proportion of their incomes on mobile telephony. We also have an arrangement in Europe which is significantly different than in the United States; the European who makes the call pays for all of it — in other words, a calling party pay system. (The United States has a receiving party pay system.) The payment arrangement in Europe makes mobile phone charges very high for the caller.

In Europe, some countries have broadband take-up rates that are well above those of the United States,

although none as high as in South Korea; others have much lower rates. Broadband competition depends greatly upon the scale of the market. For example, in Malta with a population of 60,000, the prospect of a competitive telecommunications system is really pretty small. However, even in the largest countries in Europe - Italy, Spain, the UK, and France - one still finds that the historic fixed monopolist has a persistent dominant position within the voice market. In the UK for example, about 80 percent of fixed lines are provided by British Telecom (BT), the incumbent, and the remaining lines are provided largely by cable companies. In other European countries that don't have cable networks, the historic monopoly operator has a dominant share of about 90 percent. Therefore, opportunities for developing competition in fixed voice services have been limited.

With respect to mobile competition, the situation is more promising. A large European country has 4 or 5 mobile operators. The UK, for example, has 4 mobile operators, with a 5th one pending. One does see competition similar to that in the United States, although the charges are lower in the United States due to the payment system there. Despite higher charges in Europe, one does see in several European countries what appears to be authentic competition among operators of roughly equal size. In some of the smaller countries, however, there have been suggestions of collusive behavior.

In the UK, the Netherlands, and Belgium, which have cable networks, the platform exists for the competitive delivery of broadband services. In most other EU countries, however, the only mode of delivering broadband services via wire is through use of the assets of the fixed monopoly operator. So the fear in Europe is that the monopolist will continue to dominate in the current generation broadband markets, which is based on Asymmetric Digital Subscriber Line (ADSL). If there is substantial competition for ADSL services through unbundling and other mechanisms, competition in broadband services could occur. Then, as customers increasingly migrate to Voice over Internet Protocol (VoIP) services, broadband operators will be better positioned to compete in providing the next generation of services, which is based more extensively upon fiber, such as fiber-to-the-home.

Shift to a New Regulatory Regime

How have the EU's procedures and mechanisms moved toward meeting those objectives? It really took a stupendous effort on the part of European regulators to drive down interconnection rates, thus encouraging competition in voice calls. They began to reduce rates in 1999 and finally succeeded two or three years ago. However, while this preliminary step toward greater competition has been made, we have realized that it was not done in a sufficiently systematic manner. Therefore, we are in the process in the EU of developing a completely new regulatory framework which is based on technology convergence; cable television, wireless, fixed telecommunications, and broadband individually will no longer be regulated separately. In the new world of electronic communication services, almost everything seems capable of being touched by competition. We should therefore try to shift from the traditional form of regulation to greater reliance on competition law to address the adverse consequences for consumers of very high levels of market concentration. In some of the markets, such as mobile services, this shift has already occurred; in other markets, such as international voice calls, it's likely to happen fairly quickly. However, in others, entrants have been reluctant to make investments in genuine network infrastructure; in the absence of such investments, sustained competition and a shift in regulatory regimes cannot be realized.

The objectives of the new regulatory regime are: (1) competition; (2) investment and innovation; (3) consumer protection; and (4) consistent regulation across Europe. The second and third objectives could pose a conflict to regulators. Investors will contemplate new investments only if they think they will make money. However, if incumbent resale prices are too low due to heavy-handed regulation, entrants will only have an incentive to resell the incumbent's services and will have little incentive to make genuine network investments. So there really is a very difficult quandary: Do regulators ask consumers to make a small sacrifice now by imposing slightly higher prices so that in the future customers realize a much bigger benefit which is genuine competition in the telecommunications sector? Obviously, regulators and politicians tend to have fairly short time horizons. In my opinion, there's a strong justification for backing away from certain types of retail price regulation now, while at the same time encouraging entry of competitors so that consumers might benefit from sustained competition at the network level in the future. But then I'm a professor and don't have to run for elections every three or four years.

The Modus Operandi of the New Regime

There are three steps regulators must go through in the new regulatory regime to determine whether they should regulate a market. First, regulators have to define "relevant" markets. Second, once they've defined these markets, they have to analyze the markets for dominance. If they find dominance, which could take the form of a single firm monopoly or several colluding firms, the third step is to actually craft remedies designed

to prevent that dominant firm or firms from exploiting their market power. For example, a regulator might require the dominant firm to make its assets available to competitors at some price which is determined by the regulator.

Now why has this approach of *ex ante* regulation been adopted? Why not simply rely on competition law? There are considerable barriers to entry in certain markets, such as the local loop or most wholesale markets, and these barriers are likely to persist in the future. Moreover, EU members thought it better to rely upon a sector-specific regulator taking action against anti-competitive firms, rather than wait until people make complaints. In essence, each regulator must identify a number of key markets — in fact there are 18 of them — which require specific *ex-ante* regulation. Regulators must send their findings to Brussels for approval. Once those markets have been identified and dominance in those markets has been found to exist, remedies must be imposed. These remedies may be subject to some kind of challenge, so *ex-ante* regulation is a complicated and time consuming process. There's an ascending scale of gravity or rigor in the array of remedies available to regulators. One simple remedy is to require firms to publish their tariffs — that's what we call transparency. At the other end of the scale is the hard-hitting remedy that requires dominant firms to make their assets available to competitors at long run incremental prices, such as TELRIC or LRIC.

Prospects for Fixed and Mobile Services

The key to success of this new regulatory framework is competition in broadband services. In the UK we have investigated the potential for alternative types of broadband access technologies. What we know is that competition is more likely to occur where cable networks can provide that basic second wire to the premises. WiMax offers some cost advantages in areas slightly beyond suburban boundaries; urban and suburban areas are still more cheaply served through wires. Therefore, one might ask whether it is possible to develop a broadband distribution business which is based upon this relatively small market, when it's quite likely that urban and suburban customers will choose alternative methods of delivery. My interpretation of the data causes me to be a little pessimistic about the opportunities for wireless delivery of broadband services in Europe.

The policy generally adopted in Europe is to promote increased infrastructure competition in the provision of current generation broadband. And the method that's being used to do this is to make available a set of wholesale broadband access products to competitors. The competitor resells the incumbent's wholesale broadband products. Once the competitor has established a number of customers, it starts installing its own IP networks. If the competitor has a large number of customers in a particular area, it starts to construct its own network. And the process culminates when the competitor has enough broadband customers within any local exchange that it makes economic sense for the competitor to install its own lines. At that stage, the competitor's only point of contact with the incumbent is to rent the incumbent's unbundled loop. So following those steps, competitors gradually mount the ladder of investment. And ultimately enough infrastructure competition occurs so that everything is contestable apart from the local loop.

To promote increasing competition, regulators must ensure that relatively low access prices for broadband products are offered. Gradually, as regulators try to maneuver the entrants into making more of their own investments, some of the products are withdrawn or become more expensive, and competitors are given the appropriate incentives to build their own network infrastructures. To accomplish this is a hazardous enterprise which requires regulators to have a degree of understanding of the markets and indeed of private sector decision making. But the prize is considered to be so great, the prize of being able to break out in the current generation broadband from the shackles of monopoly regulation which we've inherited. The prize is so great that I think it's probably worth doing.

Let me conclude by offering a brief account of what's happening in mobile. Although fixed services in Europe are problematic, mobile keeps moving ahead quite well. In many countries in Europe we now have 3-G mobile competition and it appears as if this competition will bring down prices for mobile voice services considerably. Thank You.

Highlights from Roundtable Discussion: Competition and Innovation in Florida

This discussion was introduced by Professor William Lehr, Massachusetts Institute of Technology, who provided a brief overview and introduced the panelists: Michael Gross, Vice-President of Regulatory Affairs, Florida Cable Telecommunications Association; Ed Hoffman, Business Manager, GRUcom, Gainesville Regional Utilities (GRU); Gary Sanchez, Associate Director for State Regulatory Relations, Cingular Wireless; Marshall Criser III, Vice-President of Regulatory Relations, BellSouth Telecommunications, Inc.; and George Ford, President, Applied Economics Studies and formerly of Z-Tel Communications, Inc.

Dr. Lehr, MIT – Policy mattered in bringing us the communications technologies we enjoy today. Policy

also matters in determining the technologies of the future. We might ask whether advances in technology will result in sufficiently robust facilities-based competition so that last-mile bottlenecks, however determined, can be eliminated. In discussing the level of desired competition, we must first determine the service under consideration (voice, video, data, or bundled services) and then the time horizon (near future versus next generation platforms) for new services. Asymmetric regulation was shaped by past policies but we want to move toward a regulatory regime of symmetric rules. We don't care what pond ducks come from. We only care that they look like ducks. Competition is affected by the policies applied to opening access to last-mile infrastructure. For example, rules governing unbundled network elements critically harmed the competitiveness of competitive local exchange carriers (CLECs). Competition is also affected by companies' business plans and the investments in infrastructure determined by those plans. Even with the advent of greater competition, certain issues remain, such as the re-definition of universal service or the methods of protecting consumers against security infringements resulting from improper use of information technologies. So, regulators will continue to have jobs as these and other issues persist.

Mr. Gross, Florida Cable Telecommunications Association – Competition is increasing for voice, video, and data services in Florida and the nation. The deregulatory approach taken by Florida, both through legislation and FPSC decisions, is stimulating the Florida economy by encouraging companies to invest in new technologies and improved infrastructure. Competition is occurring in the video market with vigorous rivalry among multi-channel video program distributors offering closely substitutable services. Cable's national share of distribution is 73 percent and direct broadcast satellite's national share is over 23 percent. Although there is some debate about the relative market shares of cable modem and Digital Subscriber Line (DSL) services in high-speed data transmission, there is no doubt that demand for both has grown; cable modem service increased by 28 percent in the last six months of 2003 compared to ADSL lines, which increased by 20 percent in that time period. According to the FCC's most recent data, broadband growth in Florida exceeded the national average. With respect to voice services, the CLECs' market share in Florida increased to 16 percent in mid 2003 from 13 percent in 2002. The demand for VoIP services is also projected to soar as this service becomes more available in Florida and the nation. For example, Bright House Networks has launched VoIP service throughout Pinellas and Hillsborough counties and plans to add that service in three other Florida counties by the end of 2004. Florida's deregulatory policy toward VoIP service is promoting true facilities-based competition in the voice market. Finally, certain safeguards should be in place to keep local governments from competing unfairly with private providers of communications services. Local governments should hold public hearings and receive public approval for proposed telecommunications systems, as well as identify the revenue sources for funding those systems.

Mr. Hoffman, GRUCom – A part of GRU, a municipally-owned utility in Gainesville, Florida, GRUCom was licensed in 1996 by the FPSC as a Competitive Access Provider and CLEC. GRUCom is a fiber-based utility of 200 cable miles, offering fiber transport services, special access and point access. The utility also provides dedicated service to large Internet users, dial-up Internet service to residential users and broadband Internet to several apartment complexes. Moreover, the utility operates a public safety radio system and leases tower space to wireless providers. GRU entered the telecommunications business because at the time there was no competition, prices were high, and the network was inadequate to meet service demand. Other Florida cities operating telecommunications services include: Bartow, Bushnell, Daytona Beach, Lakeland, Leesburg, Ocala, Quincy, Tallahassee, and Tavares. GRUCom co-locates with other carriers that use its network to serve customers. The utility has continued to acquire new technologies and apply those technologies to new applications, such as connecting traffic signals to fiber so that they can be remotely controlled or establishing a wireless canopy that connects the University of Florida's Wi-Fi network with a downtown network. As the utility seeks to expand its fiber optic network and broaden the network's applications, certain challenges remain. A recent FCC decision will make it more difficult for GRUCom to access BellSouth's local loop, thus forcing GRUCom to install its own loops. Certain regulations and rules make it uneconomic for GRUCom to distribute video over fiber. Broadband over Power Lines (BPL) may be of interest to GRU, which also provides electric power. The competitiveness of BPL will depend on state regulatory incentives and disincentives. Finally, GRUCom opposes any legislation that would place a moratorium on the expansion of municipal utility telecommunications services.

Mr. Sanchez, Cingular Wireless – The wireless industry has experienced major growth, intense competition, and major changes in recent years. In Florida, there are eight competitors, up from two when wireless service was first offered in the state. Moreover, there is considerable competition among handset providers. And consumer demand for wireless services has grown rapidly. As of December 2003, Florida reported 10.86 million wireless subscribers, more than twice as many as in 1999. Florida's wireless industry supports 13,884 employees for a total of over \$572 million in annual wages.

Competition in Florida and the nation has benefited from a climate of limited regulation that has allowed

wireless providers to innovate, differentiate their products, and expand their services. Product differentiation takes the form of roll-over minutes, plans for anytime minute calls or free weekend calls, network reliability, customer services, speed of communication, nationwide coverage, and unlimited local calling plans. The results of innovation are reflected in the significant drop in calling prices from \$0.60 to \$0.10 over the past ten years, the shrinking size of the phone, and widespread use of wireless service by the general public. Despite limited regulation, wireless providers are still subject to oversight from multiple agencies, like the FCC, the Federal Trade Commission, state attorney generals, and state consumer advocates.

Customers continue to expect value for price, performance, and customer service. Wireless providers face challenges in differentiating their products to meet customer demand, managing customers' expectations of ubiquitous coverage, and preventing re-regulation. Another challenge is cash flow. Wireless providers must also make investments to pay for licenses, enhance their network, expand coverage, and improve service quality before they realize profits. Finally, wireless services are taxed at a higher rate than are other business services. The effective tax rate in Florida is 16.12 percent, making Florida's tax the second highest in the nation for wireless services.

Mr. Criser, BellSouth Telecommunications, Inc. – The title of this meeting is: Is the Tail Wagging the Dog in Communications Policy? The dog we're talking about is made up of many different technologies, many types of technologies, and different kinds of customers. The story that reminds me of this observation began when, over the summer, my children decided that I needed a second dog. At that time they discussed at length this pure bred Golden Retriever that they had found in Atlanta and were going to buy for me. Somewhere along the way I dissuaded them from that notion, but lo and behold on my birthday two weeks ago, my children had still decided that I needed to have a dog. So what I have now is a mutt. Mutts are good and this particular mutt is good, but a mutt is a blend of a lot of things. It's not necessarily all good things and this mutt certainly needs to understand that it must grow up and behave himself.

The reality is that what we have in Florida for telecommunications is a dog that is many different breeds, all brought together. It may not be what we envisioned at the beginning of this process of opening markets to competition, but is what we have. And therefore we have to deal with it. The communications industry is a complex ecosystem of multiple technologies and different forms of competitors – interdependent and converging. It's just another type of mutt.

Despite these changes to the industry, the recent hurricanes brought home the point that we've learned a lot of lessons. The primary lesson is that our core values are intact. The industry showed considerable cooperation and collaboration and never forgot its main focus – the customer. But the customer has changed quite a bit, as well. During those storms I used my I-pager to send a message to my daughter, who replied with text messages to my cell phone. My parents were traveling during the last storm. I found that every single day I was able to communicate with them and share what was going on in their home in Gainesville and what was going on in their family. The issue is that we had a choice of communications technologies to stay in touch. All these different technologies are converging and defining the market.

From this new converging market, we have learned some lessons that have implications for regulatory policy. You're not going to control and you shouldn't try to control customer choice. Customers will choose whatever product they want at the lowest price and the highest quality of service. Technology is not going to bend to regulatory policy. Regulatory policy needs to bend to where technology and the customers say it is going.

To conclude, the dog we have is really a mutt. It's wagging its tail; it's not going to stop wagging its tail. It is a puppy today but soon it will be an adult and it will become whatever it will become. You're not going to stop that, you're can't control that, and none of us can. So we need to recognize the dog for all its aspects and try to adapt policy accordingly.

Dr. Ford, AES, formerly with Z-Tel Communications – The current status of telecommunications regulation is totally chaotic and there is great legal uncertainty due to, for the most part, decisions by the FCC and the D.C. Circuit Court of Appeals. Nobody really knows what the regulatory rules are anymore; we're all trying to figure that out. The Telecommunications Act of 1996 is the tail wagging the dog. The preamble of the Act also calls for competition to be promoted and regulation reduced in order to secure lower prices and high quality services for American consumers and encourage the rapid deployment of new telecommunications technologies. What's happened recently is that we have begun to focus on the consequences of the Act's mandates to promote competition and reduce regulation. We're trying to encourage the deployment of telecommunication technologies. If it happens that monopoly is the right way to encourage deployment, we'll accept monopoly. But in my opinion, this is a clear violation of the Act.

A key to greater competition and market share is the pricing of unbundled network elements. For example, the CLECs' market share in Verizon's service is lower than their market share in BellSouth's service

areas. Why? Because prices for unbundled network elements in Verizon's areas are generally higher than in BellSouth's. If incumbents refuse to sell unbundled network elements at prices conducive to market entry, both competition and innovation will be constrained. The D.C. Circuit Court of Appeals decision on this matter makes entry a riskier proposition for Florida and the nation. It's very difficult to force vertically integrated companies that provide both wholesale and retail service to sell their wholesale services when they enjoy large profit margins and large market shares at retail. However, the Telecommunications Act of 1996 is still the law. Section 271 of the Act recognized the continued need for network unbundling under certain circumstances, even if there is the potential for facilities-based competition. In my opinion, state commissions still retain the authority to mandate unbundling at current or other rates.

Highlights from Roundtable Discussion: Access to New Technologies and Services in Florida

This discussion was introduced by Professor Johannes Bauer, Quello Center, Michigan State University, who provided a brief overview and introduced the panelists: Mr. Tom McCabe, Manager of External Relations, TDS Telecom; Mr. Lloyd Tribley, Program Director, Governor's Working Group on the Americans with Disabilities Act; Ms. Coralette Hannon, Senior Legislative Representative, AARP Department of State Affairs; Ms. Kay Young, Director, Florida Learning Alliance; and Mr. Charlie Beck, Deputy Public Counsel, Florida Office of Public Counsel. Below is a distillation of their remarks and slides.

Dr. Bauer, Quello Center, Michigan State University — Competition is not a goal in itself. Increasingly more services will be facilitated by electronic means of competition, which will rely on advanced communications platforms. Therefore, high-speed access to those services will be critical. How are we doing? Florida ranks above the national average in terms of penetration rates in both traditional telephone and broadband access. However, if one looks closely at broadband service availability by zip code, zip codes associated with lower income areas in the state have lower penetration rates. Are we satisfied with this situation? Is it only a matter of time before everyone has equal access to broadband services? Is there anything public policy should do to promote greater access?

Mr. McCabe, TDS Telecom — TDS Telecom owns and operates 112 small incumbent local exchange carrier (ILEC) companies in 28 states serving 800,000 lines. Some of the markets are urban and some are rural, including Quincy, Florida. In 1997, TDS also formed a CLEC that serves five states. For years, TDS companies had a simple business plan; they only provided dial-tone and access service. Access line usage and revenues have been flat or declining in recent years and second lines are being displaced by DSL and, to a larger extent, by cable modems. TDS customers in rural areas are asking for the same services that are provided in urban areas. Advances in technology, competition, and customer demand are forcing rural companies to provide bundled services of voice, video, and data.

There is still a digital divide in the United States and Florida, but it is narrowing. An FCC report shows that only 1 percent of Florida zip codes lack access to at least one high-speed provider. All Florida ILECs have deployed some level of broadband service. The reasons for the digital divide? TDS has increased its deployment of DSL services from 10 percent in 2000 to a projected 63 percent by the end of 2004. However, the customer take-up rate is only 4 percent, lagging far behind availability. Future deployment plans include more 384K products, bundled services of DSL, video, and voice, wireless home networking, VoIP, and video over IP. Broadband is expensive so TDS takes a cautious approach toward deployment in order to make sure vendors will still be there in two years and the company reaps the anticipated lower-cost benefits of next generation technologies.

My policy recommendations include: using a light regulatory approach toward broadband and not complete deregulation; establishing properly structured tax credits, loans, and grants for broadband deployment; adding broadband capabilities to the definition of "universal service," and subjecting all communications providers to universal service contribution requirements; eliminating restrictions on ILEC retail pricing and bundling of broadband services and products; ensuring regulatory parity among providers of communications and broadband services; holding government-owned networks to the same regulatory standards as other carrier networks.

Mr. Tribley, Governor's Working Group on the Americans with Disabilities Act — Twenty-three percent of Floridians have disabilities. The Governor's Working Group on the Americans with Disabilities Act operates a Clearinghouse on Disability Information. Complaints regularly lodged with the Clearinghouse relate to the lack of accessibility to technology systems. Several federal laws require fully accessible IT (Information Technology) services, including the Americans with Disabilities Act-1990, Sections 504 and 508 of the Rehabilitation Act; Section 255 (amended in 2001) of the Telecommunications Act of 1996; and the Assistive

Technology Act of 1998. With respect to the Rehabilitation Act, post-hoc accommodation is not permissible. Specifically, one cannot develop an alternate version of a web site, such as a text-only version, whose specific functionality is to accommodate persons with disabilities. Section 508 of the Act provides the first federal definition of "Internet accessibility," provides compliance language that can be automated and monitored at a distance, and holds state government accountable pursuant to the Assistive Technology Act of 1998. In 2001 and 2002, Governor Bush required the development, procurement, and deployment of all state IT to comply with the provisions of Section 508. Any outsourced IT projects and products must meet Section 508 standards. We work with state agencies and the Department of Management Services to develop the language in the contracts.

Accessible technology is a civil rights issue. IT changes but the civil rights are there! IT issues are highly political and highly controversial and compliance is expensive for some companies so we spend much more time addressing the political policy issues than the technical issues. Florida has a window of 18-24 months to comply with accessibility requirements because of a lawsuit by the National Federation for the Blind against the state of Arkansas and an IT company that deploys a small version of a purchasing system in the states of Arkansas and Florida. The company's website has a section for persons with disabilities that is not accessible. This is an example of many of the issues that we are dealing with daily worth millions of dollars in terms of both projects and litigation.

Ms. Hannon, AARP – "Confusopoly" is the term I use to describe a group of companies with similar products that intentionally confuse customers instead of engaging in price competition. I'll cite two examples. First, in March 2004, the National Association of State Utility Consumer Advocates (NASUCA) filed a petition with the FCC urging the FCC to prevent wireline and wireless companies from adding line item charges to customer bills unless those charges are specifically mandated by federal, state or local law. In its filing, NASUCA reported that many line item charges on bills are very deceptive and misleading and there are no demonstrable relationships to the costs they purport to recover. Second, according to the results of AARP's 2000 national long distance telephone survey, 39 percent of all long distance callers did not know that basic rates are the most expensive rates charged. Among respondents 65 years and older, close to 60 percent did not know the difference.

Other findings culled from that survey indicated that people age 65 and older are less likely than younger people to shop for the best price for long distance service. From a wireless survey AARP conducted in 2003, we learned that respondents 65 and older are significantly less likely to have cell phone service than younger people. Moreover, for the older population, security in case of emergency was the most common reason for cell phone ownership. In contrast, convenience was rated of higher importance by younger respondents. Higher monthly expenditures for cell phone usage were also correlated with lower levels of satisfaction; satisfaction levels increased as spending went down.

In a 2004 survey of Floridians age 50 and older, the AARP gauged respondents' perceptions of competition resulting from the FPSC's order to rebalance local rates as a result of legislation enacted in 2003. Eighty percent of respondents say that they did not believe that a rate increase would guarantee competition among phone companies and instead may put consumers at risk of further rate increases. Moreover, 71 percent of respondents with household incomes of more than \$75,000 and above reported that they would not be willing to pay more for basic local telephone service even if they could choose between telephone companies. The percentages were even higher for respondents with household incomes of \$75,000 or less. To conclude, our survey findings indicate that older Floridians are unwilling to pay more in the hope of creating a more competitive market in local telephony and they are less likely to participate in competitive markets. So while AARP agrees and supports greater competition, we need to keep this customer base in mind as we move forward.

Ms. Young, Florida Learning Alliance – The Florida Learning Alliance (FLA) was established in 1998 by the Florida Virtual School and three regional consortia representing 34 small and rural school districts. Its mission is to increase academic achievement for students in represented districts through distance learning and other innovative strategies. Four years ago, Florida's rural schools had no broadband access; hardware and software was in short supply and purchases were not always prudent; there was limited computer training for teachers who lacked instructional integration strategies; and student performance was overall below expectations.

FLA subsequently received a Technology Innovation Challenge Grant from the U.S. Department of Education that has allowed it to provide broadband Internet access to all the schools and many classrooms. FLA did some vertical technology planning with the affiliated school districts by examining their needs and the most economic ways to address them. FLA purchased several hardware and software web subscriptions and also purchased video-conferencing equipment for every affiliated school district. In addition, FLA also offered training on how to integrate technologies into the curricula. This training project produced learning communities of teachers and students not only within Florida but throughout the world. FLA relies heavily on E-rate assistance

of approximately \$1.2 million annually to support Internet connectivity. FLA also promoted technology leadership through its connectivity conference. The results of increasing broadband access include better student test scores and grades, greater parental involvement, improved technology products, and a high level of technical competence on the part of students which makes them more marketable.

Challenges still remain: the FLA-member districts need more computer equipment and digital curricula; teachers need training on more effective uses of web-based education products; the FLA needs to enhance its purchase power; and partnerships between schools and the private sector need to be expanded.

Mr. Beck, Florida Office of Public Counsel – Today, I address two topics – Lifeline and high-cost assistance. My remarks reflect my own views and not those of the Florida Office of Public Counsel (FOPC). The Lifeline program assists low-income subscribers by reducing their phone bills by \$13.50. This reduction is in the form of a credit and is deducted from the basic service charge. Eligibility is based on participation in one of the specified public assistance programs and, for Verizon, Sprint, and BellSouth customers, on having an income of less than 125 percent below the federal poverty level guidelines. One of the biggest issues is that the take-up rate of Florida customers eligible for Lifeline assistance is below the national average. In Florida, it is only 14 percent of all eligible customers compared to 38 percent nationwide.

Certain activities have been undertaken to modify Lifeline eligibility and implementation in Florida. First, the FPSC proposed to expand the eligibility criteria governing the Lifeline program to include the school lunch program. The FPSC also proposed a two-tier program which would allow customers to receive only the federal portion of Lifeline contributions if they self-certify eligibility. (Without company contributions, that amount is \$8.50.) The companies and the FOPC objected to the proposed two-tier program and the issue is still pending. Second, customers might subscribe to plans or have two lines that presently disqualify them from a company's Lifeline program. The FOPC has proposed rules to address these and other barriers to greater participation. Third, approximately \$2.8 million could be available to promote Lifeline pending FPSC approval. This money would come from an agreement between BellSouth and the FOPC stemming from a case in which BellSouth was required to refund late-payment charges.

An issue pending before the FCC is high-cost assistance for rural telephone companies. To receive high-cost assistance, companies must have "eligible telecommunications carrier" (ETC) status. The ETC designation is tied to characteristics of the company's service area (generally sparsely populated areas) but not to customers' ability to pay. For example, Smart City Telecom with 16,638 working loops serves Disney World. Yet, the company receives almost \$50 per month in high-cost support per loop. So someone in North Dakota who calls someone in Idaho could be charged 9 percent in universal service charges and a portion of that person's payment is helping support the \$50 per loop subsidy to Smart City Telecom.

Another issue is the growing size of the high-support fund, in part due to greater wireless carrier participation and the increasing number of eligible lines that trigger high-cost support. Funding for high-cost support to wireless ETC carriers has grown significantly from \$535,000 in 1999, to a projected \$229 million in 2004. High-cost support also applies to all lines, not only primary lines, so that has contributed to growth of the high-cost fund. In 2003, approximately \$300 million or 10 percent of high-cost support was applied to non-primary lines. Rural companies are particularly concerned that if the high-cost fund becomes too large, their allocations are in jeopardy. One proposal before the FCC would base high-cost support only on primary lines, but the rural companies are very opposed to it because their existing funding allocations could be reduced.

Highlights from Wrap-up Session

Dr. Jamison facilitated the concluding session of the Roundtable by posing the question: *What are key communications policy challenges for Florida?* Below is a synopsis of challenges and explanations suggested by Roundtable attendees and presenters. **These observations do not necessarily reflect consensus among participants, nor was there any effort made to arrive at consensus.**

A. Universal Service Fund and High-Cost Assistance

- 1. Purpose of Universal Service going forward.* As we consider the future, what should the purpose of universal service be? Should more than voice services be targeted for universal service? Universal service costs are high in the U.S. compared to other developed countries: Does this mean that we are spending too much? Should broadband service be targeted for universal service? If universal access obligations were to include broadband, would it be better to target conduit to homes and offices, whether cable, wireless, or other, rather than services, as is currently the case? Arguably, the technology for providing service should have no bearing on contribution obligations, but a

problem arises as to who pays. For example, very small operators might be exempted because the administrative costs of handling their contributions might outweigh the benefits. Historically, universal service has been funded based on interstate revenues which have declined proportionately over time for some providers. Should the basis of support be different going forward?

2. *Inconsistency in policy objectives and existing modes of regulation.* Presently, two objectives (universal service and competition) co-exist in the United States and both are included in the Telecommunication Act of 1996. However, some believe that the mechanisms for realizing them appear to be incompatible: Universal service is promoted through retail regulation while competition is facilitated through wholesale regulation. Furthermore, the state and federal roles are different in universal service and competition. The challenge is therefore to migrate from the legacy system of regulation and inefficient subsidies to ultimately achieve efficient prices and services in a competitive market.
3. *Size of the Universal Service (high-cost) Fund.* The fund has become large and Florida's company recipients are not receiving their fair share. It will take coordination with and cooperation from the federal government, state government, and the telecommunications industry to address that issue and reform the support mechanism. Arguably, some of the problem is political. Some are concerned that telephone providers in rural areas receive high subsidies the Universal Service Fund even though these providers charge rates for local telephony that are lower than those of less subsidized and unsubsidized providers.
4. *Inefficiency of high-cost subsidies.* Currently, some high-cost subsidies go to companies serving affluent people who choose to live in high-cost areas. The current subsidy system also provides inefficient incentives for investment and competitive entry. It may be possible, however, to target subsidies to particular individuals if either retail prices or wholesale prices are regulated. Problems arise when prices are controlled at both the retail and wholesale levels as a result of subsidies. One approach is to link the subsidy to persons needing it and not to companies.
5. *Explicit subsidies.* As communications services become more competitive, social interventions should be decoupled from economic regulation. If that is not done, certain customers and companies will benefit disproportionately and the competitive process will be distorted.

B. Subsidies to Various End Users

1. *Take-up rate on Lifeline assistance.* Lifeline assistance is currently available to low-income users. As noted in Mr. Beck's remarks, the take-up rate for Lifeline assistance in Florida is lower than that of the national average. With rate rebalancing, increasing local rates, and the movement toward competition, low-income consumers may experience hardship. We need to understand why the take-up rate in Florida's program appears low and how we might increase program participation.
2. *E-rate support.* The E-rate – the Schools and Libraries Universal Service Support Mechanism – provides discounts to assist certain schools and libraries to obtain affordable telecommunications and Internet access. As Ms. Young indicated, ongoing support from this funding source is particularly important for rural schools because of economies of scale. Florida's rural schools are widely dispersed and have little purchase power; without this subsidy and the resource pooling of the Florida Learning Alliance, they would receive far too little funding through the school finance formula to afford many high-speed Internet connections.

C. New Regulatory Paradigm—"Light-handed" Regulation

1. *Definition of, and decision to apply, "light-handed" regulation.* One might define "light-handed" regulation as the minimal set of rules needed to achieve commonly-held goals. Academically, light-handed regulation is defensible and has been applied in many situations. Competition is a dynamic process and therefore warrants a different way of considering regulation. Operationally, however, light-handed regulation can be difficult to implement. There is no bright line to determine when regulation should apply and when it should not. Regulatory rules need to be considered in tandem with antitrust

rules. Within the antitrust context, this means that one should exercise economic or price regulation only when there is a significant reason to believe that market power will be abused. Companies may “game” the light-handed regulatory system to strengthen their competitive position at the expense of other companies. Some hold that light-handed regulation should be pursued in an incremental manner. A challenge to policymakers as they look to the future is to determine a set of regulatory rules that can be applied to the market symmetrically, regardless of the type of technology and physical infrastructure involved.

2. *Definition of market.* In their exercise of light-handed regulation, regulators should first define the market, identify market power or dominance, and then develop protection remedies (see below). The objective is to ensure that conditions exist to stimulate technological innovation, and that regulation is applied strategically to foster competition in infrastructure investments. Rules governing open access should be transparent and consistent for all levels of government, including local government.

3. *Market power determinations.* With respect to voice calls, regulation through a minimum set of economic interventions should be imposed only if there is a firm in the market that is capable of raising prices above competitive levels. This assessment should be independent of the type of technology used to provide the service. It is possible that mobile telephony and VoIP can act as a constraint upon traditional wireline prices. From the consumer’s perspective, it is a matter of indifference whether a call is transmitted via VoIP or through the traditional telephone network. Competition from cable companies providing VoIP might result in a very clear diminution of market power for ILECs. An incumbent telephone company shifting to VoIP from its traditional technology does not change the company’s ability to exert market power, if it has market power. Arguably, mergers between companies providing substitutable products lower competition. A related question is: When do we know if competition really exists? For example, if incumbent telephone companies have 86-98 percent of the residential market, do we really have competition in that market, setting aside for the moment whether there is a single, uniform residential market? Are prices the only determinants for a competitive market? How do we know when companies are colluding?

4. *New role for regulators.* With respect to the regulation of telecommunications, the FPSC, like other state regulatory commissions, has been transformed from regulating monopoly services to responding to petitions from competing telecommunications companies and to overseeing negotiations between companies. The Commission only intervenes when those negotiations fail, although it still is involved in tariff-related issues.

5. *Rejection of legacy utility mandates.* The transmittal of new services over platforms of incumbent and competitive carriers raises the question of how such services might best be regulated, if at all. VoIP provides a good example. The position of the National Cable & Telecommunications Association (NCTA) is that VoIP services provided in competition with incumbent utility phone service should not be subject to legacy requirements and are better served by consumer protection rules. In exchange for certain rights, NCTA submits that VoIP service providers should be required to meet certain public health and safety and universal service obligations. Florida legislation enacted in 2003 found that unnecessary regulation for VoIP was in the public interest and excluded that service from FPSC oversight

D. Consumer Protection

1. *New approaches.* As the regulatory paradigm shifts to light-handed regulation, policymakers should ensure that consumer protections are in place. The challenge is to develop effective approaches to protecting consumers when retail service regulations are not applied, as is the case with wireless carriers, or when retail price controls are being relaxed or removed as services become more competitive. In the UK, for example, certain agencies were established to inform customers about changes in the retail prices of utility commodities so that customers could make more informed decisions about their suppliers or providers. In another example, the wireless carriers in the U.S. worked with their umbrella association to develop a 10-point consumer code of conduct, which was ultimately adopted in 2003.

2. *Role for the FPSC.* For its part, the FPSC tries to refer consumer complaints to the appropriate carriers first for resolution or to other agencies if appropriate. If the complaint involves a technical issue over which the

FPSC has jurisdiction, the FPSC handles it.

E. Competition

1. *The critical juncture.* According to Dr. Cave, we are at a critical juncture where one of two scenarios may occur: (1) the incumbent provider dominates broadband service deployment in future years and we face the same regulatory problems in 10 years or (2) a more uniform distribution of firms will offer voice and broadband services and competition will evolve. The latter scenario might come about if a range of new services is offered by a convergence of competing technology platforms or if a variety of different competitors are positioned to compete for a growing number of customers, or both.

2. *The key challenge.* As regulators proceed down the path described above to create conditions favorable for fostering innovation, the key challenge they will face is how to manage economic regulation to produce competitive outcomes, while at the same time, managing social regulation through appropriately targeted interventions.

Glossary

ADSL — Asymmetric Digital Subscriber Line. See DSL.

BPL – Broadband over Power Lines. BPL systems use existing electric power lines as a transmission medium to provide high-speed communications capabilities by coupling radio frequency energy onto the power line.^c

Broadband – Broadband is descriptive term for technologies that provide consumers a signal switched facility offering integrated access to voice, high-speed data services, video-demand services, and interactive delivery services.^a

Calling Party Pay System- A billing method in which a wireless phone caller pays only for making calls and not for receiving them. In contrast to the EU billing system, the standard U.S. billing system requires wireless phone customers to pay for all calls made and received on a wireless phone.^a

CLEC – Competitive Local Exchange Carrier. Any company, not an incumbent telephone company that is certificated by a state public service commission to provide local exchange telecommunications service within that state. In Florida, CLECs were certified by the FPSC on or after July 1, 1995.

Co-location – The placement of a competitor’s equipment in a local exchange carrier’s central offices in order to provide comparably efficient interconnection.^d

Competitive Access Provider – A carrier who provides local service (typically over a fiber optic network) and competes against local telephone companies’ access services that connect customers to long distance companies.^b

Convergence – In this context, convergence means that providers of communications systems can deliver products and services that compete with the products and services now delivered by other networks. For example, a cable company might provide local phone service or a local phone company might provide video services.^b

DSL—Digital Subscriber Line is a copper-based service that allows the telephone carrier to add certain electronics to the telephone line to enhance the copper loop that provides the customer voice services so that it serves as a conduit for both voice and high-speed data traffic. The DSL service primarily used for residential customers is **ADSL**, which provides speeds in one direction that are greater than the speeds in the other direction.^c

High-cost assistance – Federal funding mechanisms that enable areas with very high costs in the United States to recover some of these costs from the universal service support mechanisms, leaving a smaller remainder of the costs to be recovered through end-user rates. In this manner, the high-cost support mechanisms are intended to hold down rates and thereby promote universal telephone service objectives.

ILEC – Incumbent Local Exchange Carrier. Any telephone company that was providing local telephone service prior to enactment of the federal Telecommunications Act of 1996.

LRIC – Long Run Incremental Cost – A measure of marginal cost used for pricing schemes for network elements sold or leased at wholesale.

Service providers – A telecommunications provider that owns circuit switching equipment.^a

3-G mobile – This term refers to third generation or advanced wireless broadband services. Customers can access the Internet and other data services at high speeds from a cell phone or other device connected to a laptop computer.^c

TELRIC – Total Element Long Run Incremental Cost – A cost estimate developed by the FCC for its pricing scheme for network elements sold or leased at wholesale.

Unbundling – The term used to describe the access provided by local exchange carriers so that other service providers can buy or lease portions of its network elements, such as interconnection loops, to serve their customers.^a

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

VoIP — Voice over Internet Protocol. The use of an Internet Protocol network to carry voice.

Wi-Fi – Wireless Fidelity. This term is used generically to refer to any product or service that uses the IEEE 802.11 series standards for wireless local area network connections. Wi-Fi networks operate on an unlicensed basis in the 2.4 and 5 gigahertz radio bands and provide multiple data rates up to 54 Mbps. The bandwidth is shared among multiple users. Typically, Wi-Fi enabled mobile devices must be within approximately 300 feet of a base station.^c

WiMax - Worldwide Interoperability for Microwave Access. This term refers to any broadband wireless access network based on the IEEE 802.16 standard. WiMax is capable of transmitting network signals covering in excess of 30 miles of linear service area and provides multiple shared data rates of up to Mbps.^c

^aSee <http://www.fcc.gov/glossary.html>.

^bSee <http://www.fcc.connectglobe/glossary.html>.

^cSee http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-208A1.pdf.

^dSee <http://www.dps.state.ny.us/glossary.html>.