BRINGING AMERICA UP TO SPEED: DELIVERING ON OUR BROADBAND FUTURE WITHOUT SACRIFICING LOCAL IDENTITY*

John M.R. Kneuer[†]

I'm John Kneuer. I'm the Assistant Secretary of Communications and Information at NTIA, and very happy to be here to talk about broadband and things that we're doing in the administration and things of policy that we're putting in place. I know it's been a subject of a lot of discussions here this morning and through the afternoon, so I'm happy to give my perspective.

So I think this pretty much captures it. We're number sixteen, sort of makes you want to chant "USA, USA." I'm sure you've heard a lot of this and arguments are there, we've heard this all before, we're significantly lagging behind Europe and Japan. The reason for their dominance: coherent government planning. They've got it right and we're sorf of been all over the map.

"Bureaucratic rule-setting and centralized economic planning—as opposed to US laissez-faire—has enormous economic benefit." That pretty much captures what everyone's been saying about this. The problem is that's not talking about U.S. broadband policy circa 2006, [that quote refers to] U.S. wireless

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policy circa 1999. Everybody was convinced that tech neutrality, auctions, competitive marketplaces—we were on the wrong path. The Europeans and the Japanese absolutely had it right. You pick a technology, you let the incumbents drive the business, you get rapid penetration rates, and we've basically just fallen irrevocably behind.

So, what happened in ten years—less, seven years? One hundred and ninety-four million [cell phone] subscribers. That number is almost certainly wrong, it's probably 5 or 6 million more than that. We've got new services, wireless broadband service for $60 a month, average cell phone bills half of what they were, unlimited minutes, unlimited local long distance, and this [cell phone] is a broadband device. Speed and availability, Verizon and Sprint, EVDO—that's broadband—700 kilobits. Cingular's, HSDPA. I was in the offices of a large Asian incumbent—one of the countries that's supposed to be sort of leading the way in all things—very proud of their HSDPA rollouts they've got planned for next year. Meanwhile, they could walk downstairs from their offices, walk into a Cingular store and buy that product here today. So, our policies of—in the wireless space, much more chaotic, but much more pro-competitive, tech neutral. We were getting clobbered in 1999, I think we have borne the fruits. So, why am I talking about that, it's broadband space? Because I think it's a little bit instructive. These same policies—deregulation, tech neutrality, pro-competition—these are the policies we're putting in place in the broadband space, and I think we're going to see some of the benefits.

So, what is the President's vision on this? The President has set a goal for us: universal and affordable access for broadband by 2007. That was three years ago and we're making a lot of progress and I'll talk about where we are on this. The importance of it—it's not just to help industry to help the quality of life of our citizens. I'm from the Commerce Department, while we talk about broadband, this isn't just broadband for broadband sake. This isn't just to get our numbers up on some OECD ranking or some other international ranking. This is about our economy, and I think if you look at some of the other countries we're being compared to in the broadband space, we're the envy of the world and the status of our economy now. It's not just the economic growth, I think the previous slide [discussed the importance of] tele-medicine, and distance learning, tele-work.

[That slide pictures] the President at the Department of Commerce. He came to talk to us about this. Before that event, we went around and wanted to get some stuff to show to him. So my former colleagues, Bill Bond, who ran technology administration, and one of our colleagues from the White House, we went up to Children's Hospital, just up the street, and met with a doctor there, Craig Sable. And they've got a tele-medicine facility there and it's not real super sophisticated stuff from a telecommunications standpoint. They've got a

couple of ISDN lines tied together and it's definitely less than a megabit per second speeds. But with those speeds, they can connect with rural hospitals in rural Maryland, rural Virginia, and bring world class medical treatment to children in rural areas. And Dr. Sable is a world class cardiologist, a pediatric cardiologist. And when we sat in his office, not a sophisticated desktop, like I said not real broadband—not real super fast speeds, and he was able to provide—to perform an electrocardiogram on a newborn baby, remotely. He had a live conference call going, saying, "Give me this view, give me that view, change the resolution, show me this, show me that." At the end of the exam, he said, "Is the mother there? Put her on a camera." He said, "You've got nothing to worry about. Your baby is fine, you don't need a follow-up." The alternative without that ability, they were going to send a helicopter to fly that child to Children's Hospital. Little babies' hearts make weird noises sometimes, sometimes it's really bad news—send a helicopter—sometimes it's nothing. But because of that technology, Craig Sable could give his expertise to that mother in rural Maryland for basically a very, very small investment and not super sophisticated broadband.

So, that's why we're doing this. So how do we get there, what are we going to do? Well, I think I said if when you go back and you look at the policies that we've put in place in the wireless space—deregulatory, pro-competition, tech neutral—those very same policies, those are the things that we're pursuing at the Commerce Department, and I think that's what's going to get us there.

Fiscal policies. If you want something to flourish, you don't tax it. We worked very, very closely with the Congress—very hard getting the Internet tax moratorium extended—we'd like to see that made permanent. But also tax relief for investments in this equipment, accelerating the depreciation of capital intensive equipment. This is very, very capitally intensive equipment, that's a help.

Removing the regulatory underbrush. You know there was a ton of talk, I'm sure all of you are familiar with during the triennial review, the TRO. All of the debate about that was focused on the old networks, unbundled network element platform, and what are the relationships that we're going to have in the old PSTN lines. What's sort of lost in that whole debate, which wasn't a big focus was the broadband piece of that that said essentially don't burden new networks with monopoly economic regulation. We don't have broadband networks out there. If you want to set the investment, don't make a condition of the investment, or as soon as you invest, you're going to be burdened with economic regulation. That was a really big deal then and as soon as that was, those rules were affirmed and they became the law of the land, I think we saw rapid, rapid investment: more than $6 billion by Verizon, $5 billion by SBC, AT&T. So, that has had a significant impact.

Moore Meets Marconi—the wireless space. Like I said this [cell phone] that I've got in my pocket, there is more than enough broadband capacity in here for Dr. Sable to perform the remote tele-medicine that he performs—that critical service—with the capacity I have coming through this phone.

Advanced Wireless Services. We worked with the FCC to identify 90 MHz of spectrum that's going to be auctioned this June. That spectrum is going to allow every wireless carrier to have the capacity to be a broadband carrier as well and a broadband provider. Those networks currently cover the vast majority of the population and geography of the United States. As all of those networks become broadband networks, that's a radical competitive shift in the marketplace.

Ultra-wideband. Enormous progress—more for local area networks than access, but still important.

5 GHz spectrum. Wi-fi—and we'll talk a little more about that later—is not just home network anymore, it really is growing beyond local area networks into wide area networks, metropolitan area networks. We've worked with the industry and with the Defense Department. Half of the 5 GHz spectrum band which is just adjacent to the Wi-fi bands has typically and historically been reserved for government radar systems, principally the Department of Defense. Industry came to us and said, "No. We think we can co-exist with those guys, we can bake it into the chip that the Wi-fi systems can listen for the radar systems and pop off those frequencies when the radar is present. If we can prove that to you and we'll double the amount of spectrum that we would have available for Wi-fi and that would be a good thing." To their credit, the Department of Defense was very, very proactive in working with them on this. Typically you come to the Department of Defense and say, "I've got a great radar detection system for you" and they lose their sense of humor very quickly. But, they pursued this and they were dogged and they worked with industry and we've doubled the amount of spectrum for Wi-fi.

The 70, 80–90 GHz band. This is a real fiber replacement in urban areas. You can link-up a building with fiber-like speeds with very, very small investments. Again we worked with the FCC. You can go on our web page, click a link, register it, and basically put a radio on your building in a day because of the administrative policies we've put in place to speed the way that was assigned.

Each of those spectrum policies that I've just talked about—the Advanced Wireless Services, ultra-wideband, 5 GHz—those are really, really hard. Technology is really coming into conflict with our regulatory experience. So the President has launched a spectrum policy initiative to update our existing legal and policy framework so that we can continue to embrace the technology rather than stand as a hindrance to it.

Broadband over Power Lines. Again, this is work we did at the Commerce Department working with the FCC and industry. There is great potential for this technology, not just by broadband, but also for it to interfere with other radio systems. When the broadband signal goes across the power lines, it essentially acts like an antenna and there is great potential for interference. That potential for interference has served as a significant drag on the rollout of the technology. We went out and did measurements in all of the test BPL facilities around the country. We were able to come up with technical resolution, technical rules, to have for, say, if you—and there is a potential for interference, but it's also pretty easily understood, there are well-understood mitigation techniques. If you do these things you can rollout your networks and your systems without concern for interference, and we're seeing a lot more of them.

So, based on all of this, we've got wireless investments, we've got landline investments, we've got the fixed incumbents upgrading their networks to compete with cable, we've got the wireless guys doing the same, we've got Broadband over Power Lines, and we're starting to see changes in the industry, particularly in spending. We had some rough times in this industry after 2000, just now we're starting to see a real consistent lift in that industry and it's these investments that are being made.

With $521.5 billion in processing equipment and software, fixed investment over $2 trillion, industry is going—those are industry investments, that's not a government check that anybody is writing to bring this stuff out there, and if somebody came and asked for a $2 trillion check, they're not going to get it. So, these—it's the industry that's making these investments and they're making them increasingly. And here are the results.

*Figure 1: Cable Modem Growth in the United States*[1]
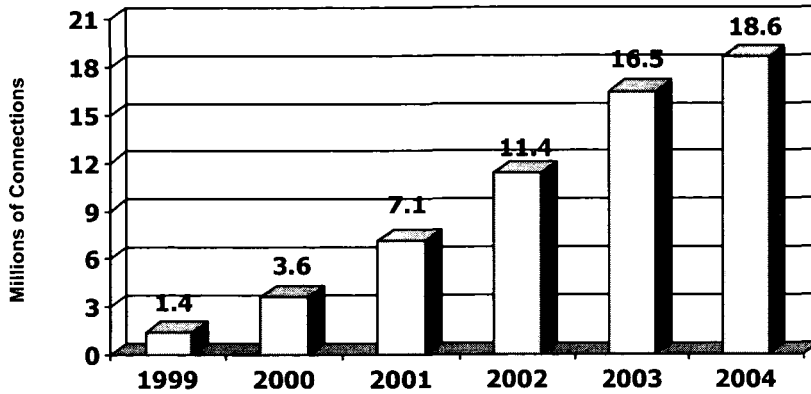
Like I said, cable has been making massive investments upgrading their networks to digital networks and as a result, their broadband subscriberships are increasing dramatically. Again, these are 2004 numbers. What is really frustrating for me as a policymaker, I want to go out and have evidence and say look at this stuff. The problem is to get really reliable numbers, they're old, and once they're old, they're essentially of limited value. That [2004] number is almost certainly north of 20 million now.

Same goes for DSL. DSL was verging on—was the solution that was not going to be able to compete with cable. They had the distance problems, everything else. All of that has been resolved, or largely resolved, and you can see the enormous growth since 1999 there. Again, [the current] number is probably closer to 16–17 million than 14 million, but you certainly get the sense of the growth that has occurred.

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1   INDUS. ANALYSIS & TECH. DIV., FED. COMMC'NS COMM'N, HIGH-SPEED SERVICES FOR INTERNET ACCESS: STATUS AS OF DECEMBER 31, 2004, at 6 tbl.1 (2005) [hereinafter 2004 HIGH-SPEED   SERVICES   FOR   INTERNET   ACCESS], http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/hspd0705.pdf.
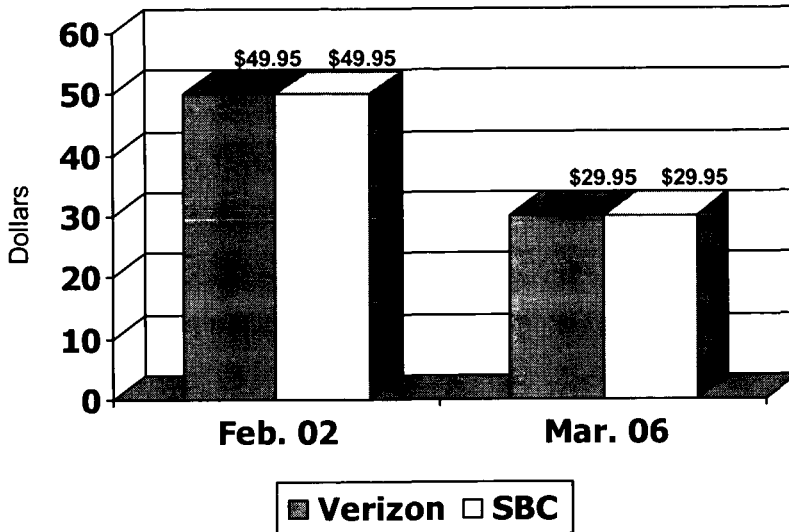
Figure 2: DSL Lines Have Continued to Grow[2]
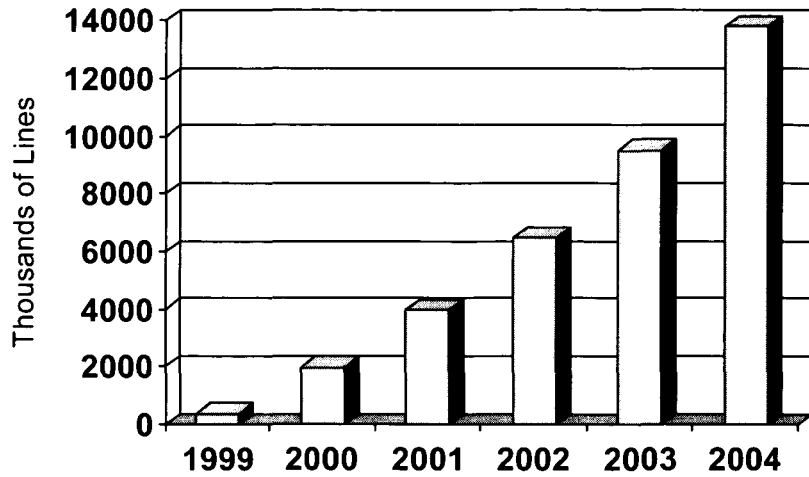
More competition. They're not only investing, the prices are coming down. I should have ripped out my morning paper today—"Get it while you can, Verizon, $14.95 for broadband, for DSL as an introductory rate." That's pretty affordable.
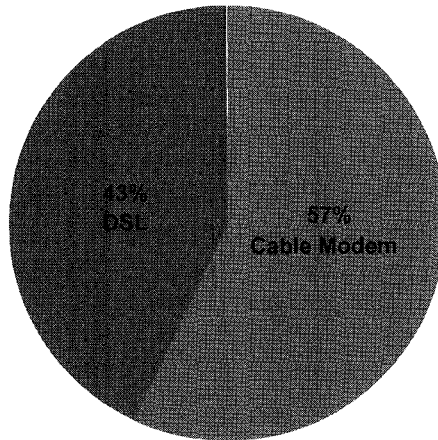
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[2]   *Id.*

Figure 3: DSL Price Drops[3]

We're thinking this fight between cable and DSL is sort of thought of as the way of the overall marketplace, I don't think that completely represents it. But these guys banging it out with one another is really bringing in significant competition in the marketplace and I think that's where you get the 50% price drops in just a couple of years and dropping. But they're clearly battling it out for market share. That's 40.2 million broadband connections. That's just cable and DSL. That doesn't count this [cell phone] and this is broadband.

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3   Press Release, Verizon Commc'ns Inc., Verizon DSL to Power Web-On-Site Public Internet   Stations   (Oct.   16,   2000), http://newscenter.verizon.com/proactive/newsroom/release.vtml?id=43928; Press Release, Verizon Commc'ns Inc.,Verizon Online Offers Twice the Speed of Its Basic Consumer DSL Service   For   the   Same   Low   Price   (Apr.   4,   2005), http://newscenter.verizon.com/proactive/newsroom/release.vtml?id=90158; Press Release, SBC Commc'ns Inc., SBC and Yahoo! Unveil SBC Yahoo! DSL, Internet Service "Built-for-Broadband"   (Sept.   13,   2002),   http://www.sbc.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=20250; Press Release, SBC Commc'ns Inc., SBC Communications Calls on Consumers to Declare Their Independence from Pricey Cable   Bills   (June   29,   2005),   http://www.sbc.com/gen/press-room?pid=5097&cdvn=news&newsarticleid=21731.

Figure 4: Cable Versus DSL Broadband Subscribers in the United States[4]

Types of broadband lines. I think this is significant. Again, we had the two big behemoths battling it out across the other slide. We got cable on a large up tick. We got DSL the same. I think those bottom lines, particularly the "Other" are things we're going to see moving up dramatically. You're going to see enormous growth in BPL, and the wireless—they're probably talking about fixed wireless things in that slide—I think the mobile wireless, the licensed, the unlicensed wireless, we're going to see all of those curves moving up, and if not even getting more into a more dramatic hockey stick-shaped curve as they begin to compete, continue to compete.

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4   2004 HIGH-SPEED SERVICES FOR INTERNET ACCESS, *supra* note 1, at 6 tbl.1.

Figure 5: Types of Broadband Lines: 1999–2004[5]
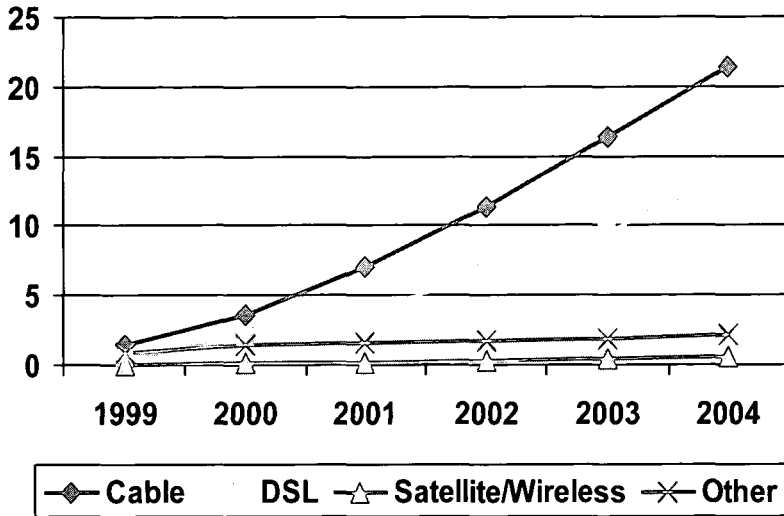
The wireless stuff is really the part that's missing in those previous slides. You know we've got the DSL and cable, but the wireless, both licensed and unlicensed, is starting to make a radical, radical change in this marketplace. Like I said, Wi-fi, we talked about Wi-fi, mostly thought of as a wireless— you're at it a coffee shop, you're at the airport, you have a network in your home, these networks are becoming wide area networks.

The biggest in the world is in rural Oregon and there's an entrepreneur that who put this thing together. He spent $5 million, it covers 700 miles, he had a couple of anchor tenants, he had a municipality, and actually his biggest industrial business customer is an onion farmer, it's the biggest onion agri-business facility in that part of the country. They use it to manage their crops, to manage the irrigation, as well as to communicate, and do all of their business transactions, but I said the municipality is the state police, they use it as a mobile device. They basically—those two customers basically represent—allow him to recoup his investment. All of the other additions are basically cash flow. I also like pointing out when people ask me, "How do I find out more about that Wi-fi network?" If you put into your Google search "Oregon Wi-fi onion," it pops right up.

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[5]   *Id.*

HSDPA, CMA 2000, these are the fixed, I'm sorry, the licensed solutions. But this is real stuff, these guys are increasingly getting into direct competition with DSL and with cable and they only will more so in the future as the spectrum becomes available as a result of our auction in June. This is—HSDPA will be up to 8 megabits in this generation, they talk about things in a couple of generations down, 20, 40 megabits per second. So that is real broadband, it is economic, and it puts increasing pressure on the cable guys, and on the DSL guys to lower their prices, to bring more applications, to compete on a variety of different levels.

Wi-max—sort of the son of Wi-fi—we actually had big Wi-fi—Wi-max deployment in the gulf area post-Katrina. Intel was able to roll-in very quickly and the technology is very robust. I think when we see the conclusion of the DTV transition, we see the 700 MHz spectrum become available, that that's going to be a very powerful competitor.

Broadband over Power Lines. This is the stuff that was sort of the technology of tomorrow—and always going to be, sort of the knock on BPL. Once we resolve the technical problems and a lot of these companies got confidence that they weren't going to have to rollback because of interference issues, they have really dramatically increased their deployments as a test matter. They're not only finding some confidence in the technology, I think we're starting to see that the utilities themselves are getting some confidence in the business models. They're learning that by putting this technology into their networks, they realize and recognize some real benefits in their underlying core business. If you deploy a BPL system you've put intelligence into your electricity grid all the way out to the customer's homes. Again, efficiencies in imaginary networks, their ability to respond to outages, basically justifies the investment in and of itself, then leverage their billing infrastructure relationship with the customer, its starts to become a compelling business case. Current Technologies— which is one of the big developers of this technology—I think they're out in the 270 corridor somewhere around Dulles [International Airport]. They've had a partnership with a utility in Potomac, and they pass about a thousand homes, and you can go out and they actually rent a house in the neighborhood, there's no sort of signage on it, you pull up and you go in and see all these salesman from the BPL company, it's kind of weird. But, they have it set up as sort of the model home, and it's 5–6 megabits per second. They've got applications that are designed specifically for the technology. The applications I saw, you can basically download a movie, have it full stream, full motion on your TV in less than the time it takes you to take a DVD out and put in the machine. They are really trying to put together integrated applications so it's not just content but they've got home security and other things, and BPL has real advantages because every electrical outlet in your house is now a broadband out-

let so you can put a broadband pipe into any place you have electricity and that presents a host of benefits and the ability to really tailor applications in a way that maybe some of their competitors in the cable space or the wireless space can't. So they have a whole different means to compete and different product differentiation.

So, number sixteen? The fact of the matter is that we're the largest broadband marketplace in the world. It's the largest broadband marketplace in the world. We've got more broadband subscribers than any others. I think we've got the most competitive broadband marketplace in the world with 40.8 million subscribers and 48 million broadband lines, that's the largest marketplace with the largest addressable market. Google is here for a reason. Yahoo! is here for a reason. People aren't designing applications and designing technology to serve Finland. I don't think this picture is as bleak as it's made out to be.

*Figure 6: Largest Broadband Markets in the World*[6]
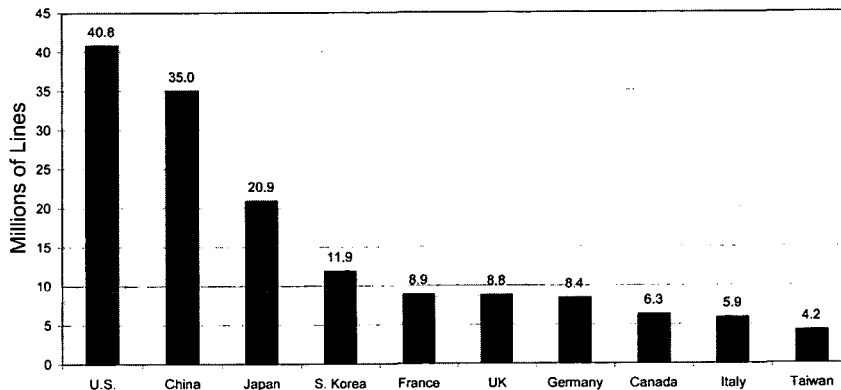
I don't think we're number sixteen in the world and I think these maps give us a sense of the growth on this. It's hard to see what each of these represent. But the blue, the real dark there, and this is December 31, 2000.

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    6   POINT TOPIC LTD., WORLD BROADBAND STATISTICS:
Q3   2005,   http://www.point-topic.com/contentDownload/dslanalysis/world%20broadband%20statistics%20q3%202005.pdf.

Figure 7: High-Speed Providers by Zip Code: 2000[7]
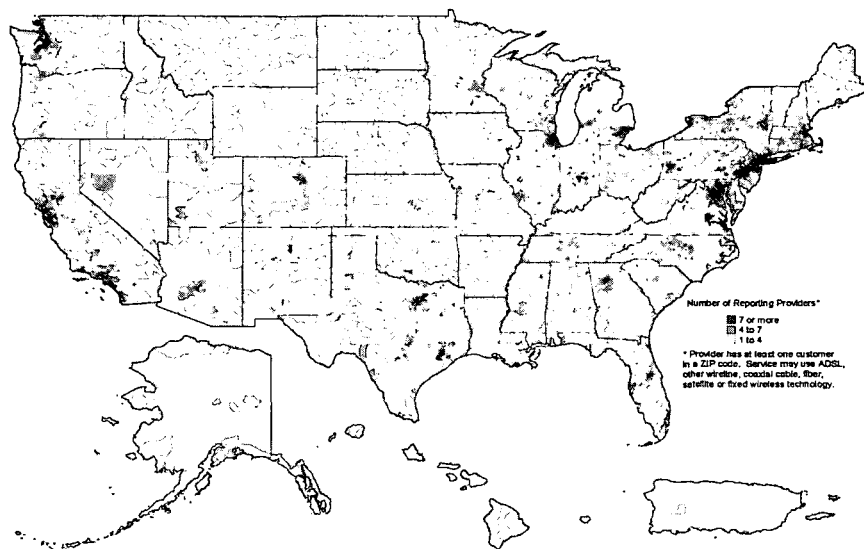
The darkest colors show competitive marketplaces, there are several more subscribers in brown. Sort of orange, four or more subscribers. The tannish is one to four, and that white space—those were the unserved areas. These are in six-month increments. And [Figure 8] is almost two years old.

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[7]   INDUS. ANALYSIS DIV., FED. COMMC'NS COMM'N, HIGH-SPEED SERVICES FOR INTER-NET ACCESS: SUBSCRIBERSHIP AS OF DECEMBER 31, 2000, at 11 (2001) [hereinafter 2004 HIGH-SPEED   SERVICES   FOR   INTERNET   ACCESS], http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/hspd0705.pdf.

Figure 8: High-Speed Providers by Zip Code: 2004[8]
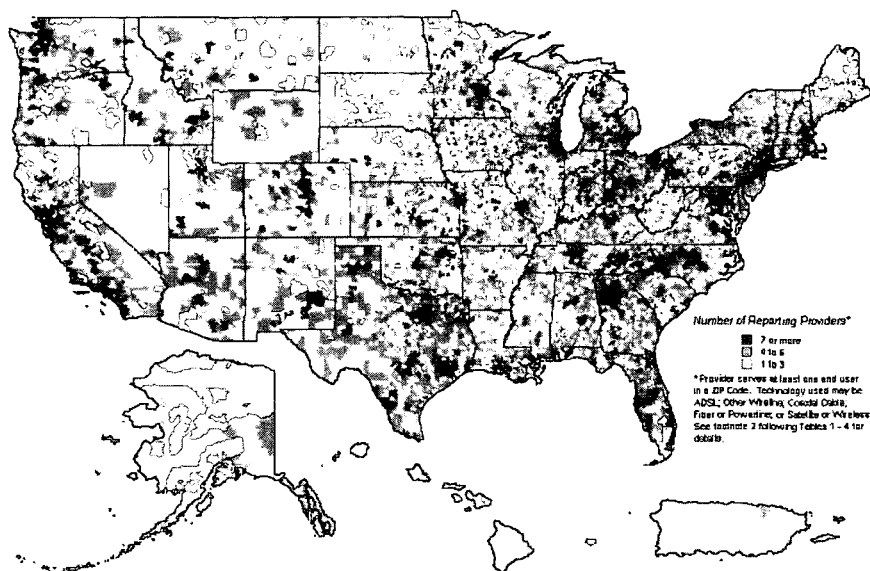
We have established the most competitive broadband marketplace in the world. We have a host of different technologies competing on price and ability, on applications, they're going to continue to compete with one another. We're going to continue to have innovation. Prices drop as a result, consumers get better access. So when somebody tells you we're sixteenth in the world don't believe them, tell them I told you otherwise. But I think going back to the very first slide, the very same criticism we got for our chaotic, overly competitive [wireless] marketplace, those same forces of competition—tech neutrality, innovation—are going to bring the same results and the same benefits to the broadband marketplace that they brought to the licensed wireless space. We're enjoying those benefits today and I'm very, very confident that in 2007, a dispassionate look at the American marketplace will say that we not only have a competitive marketplace, an innovative marketplace, but that we've got universal and affordable broadband access for essentially everyone. So, I don't know if I ran over or considerably under, but if there's more time I'm happy to take any questions or whatever you might like.

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[8]   2004 HIGH-SPEED SERVICES FOR INTERNET ACCESS, *supra* note 1, at 19.

Question: Where do you see universal service funding in the next three years, five years?

Answer: I don't know if my crystal ball is that good on what the funding is going to be. Under the existing structure we have, the contributions are dropping. So this is clearly a system that is in need of reform. I think the— obviously, the Commission has been looking into universal service reform as well as intercarrier compensation reform. We have not just explicit subsidies but lots of implicit subsidies. The Hill is obviously looking at this. My only hope would be that as we do undertake that reform, that we take into account this competitive marketplace, that we have a better understanding of what technology can deliver to these areas, and that we don't limit ourselves to sort of an old world myopic view that we got to have a single kind of pipe and a single kind of provider and a single means of funding it.

Question: What do you think the biggest threat is to continued progress in broadband?

Answer: Knee-jerk regulation. It sounds silly to say that but when the Commission was adopting the Broadband over Power Line rules, it was a technical proceeding that was resolving technical issues about the potential for BPL to interfere with largely government wireless systems. We, as the protector of federal government wireless equities, went in and said, "We think this interference can be mitigated. We think this is a good technology. Give them a shot— let them be the third, fourth, or fifth entry in the marketplace." One of the Commissioners—who shall remain nameless—I think he concurred but dissented. I didn't know you could concur on an FCC opinion, I thought you could vote yes or no. But anyhow, he objected that they weren't regulatory enough in the proceeding: "Well, what are you going to do about competitive protections and how are you going to provide, put economic regulation on these guys?" The immediate reaction to a new technology coming into the marketplace was how do we regulate it? And I think that is an old world view of looking at things. I think it's a monopolist view of looking at things. The presumption is if you're a communications technology, you're a monopoly and you need to be subject to economic regulation. I think that sort of knee-jerk, that sense of we need to regulate, preemptively, and then there's also this creeping sort of, you know, we know what's best and we can set policy, big policy that will drive broadband in certain ways.

    You know, it sounds like the Minitel. I don't know if any of you remember the Minitel. France decided in the '80s that they had picked the right technology and they were going to force the incumbents to deliver these little data boxes to everyone, they had a little LED screen, it could handle about fifty

characters and you could order a newspaper and get news clips, order a pizza, send your neighbor a little text, kind of cool texty thing, for 1985 or whatever it was. But they put it into everyone's houses and it was completely inadequate. Compared to the Internet it was a joke, and there's still something like 18%–20% still have this device because the government chose that's the right technology, that's the right device, we're going to incent in some way, if we don't mandate it, we'll do a tax benefit for the favored technology. You're 100 megabits per second, you get a tax break. Well that's great if you're a fiber guy, not so good if you're an unlicensed wireless guy who is only doing 40 megabits per second. But those are some of the problems.