UNITED STATES OF AMERICA

FEDERAL COMMUNICATIONS COMMISSION

NATIONAL BROADBAND PLAN WORKSHOP

DEPLOYMENT - UNSERVED AND UNDERSERVED

Washington, D.C.

Wednesday, August 12, 2009

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P R O C E E D I N G S

MR. DILLNER: Good afternoon. Welcome to the third installment of the deployment sessions in our staff workshops today.

Before getting started, I'd like to just have everybody silence their cell phones so that we don't have any unanticipated interruptions.

Like the two prior workshops that we've had today, we'll be able to take comments from the in-person audience here by writing questions down on note cards, and FCC staffers like Matt Warner and Karen Johnston in the back of the room can take them and get them up here to the panel. And we'll also be taking comments from our online participants in the virtual world.

This panel, like the two panels prior, is exploring what it takes to deploy broadband, what it takes to deploy broadband to the people who don't yet have broadband.

It's the marginal business cases; I like to think about it. How do you get broadband out to the next X-percent?

And so without hogging up too much of the airtime myself, I'd like to just begin. We'll have some brief opening statements by each of our distinguished panelists, and then we'll go into an open sort of question and, hopefully, strong discussion format like the prior two panels.

So without further ado, Jim, would you like to start?

MR. BRUDER: Sure. Glad to. Slides?

MR. DILLNER: Yes. Okay. Well, thank you. Thank you for having me here again today. And my name is Jim Bruder. I'm the CEO of Harron Communications. I'm also the vice chair of the American Cable Association. I'm also a member of the Harron family.

The Harron family is among the pioneers in the cable television industry. The roots of our company actually go back to when my grandfather started selling advertising time on vaudeville curtains, and then recognized then what were unserved and underserved demographics of the time.

My grandfather, Paul Herron, Sr., started and ran Spanish-language and Yiddish-language radio stations to provide information and entertainment to the underserved and unserved foreign-language speaking citizens in New York and Philadelphia, Pennsylvania. From there he went into TV broadcasting, and then in the 1960s built a cable TV system in Utica, New York; again, to serve the unserved and underserved population of upstate New York.

I'll fast forward to today. And our company continues the great tradition of bringing information and entertainment to markets that were unserved or underserved before our company entered the markets. Today, Harron Communications is a privately owned and operated family business that provides a wide variety of communications and entertainment services to approximately 200,000 video subscribers, 100,000 Internet subscribers, and 22,000 phone customers in 9 states, doing business as MetroCast. MetroCast is a leading provider of digital television, high- speed data

in 134 communities in the states of New Hampshire, Maine, Connecticut, Pennsylvania, South Carolina, Virginia, Mississippi, and Alabama.

Next slide, please. Through the expansion of the existing system clusters and investments in new technologies, MetroCast continues to expand services and products offered, resulting in subscriber growth and satisfaction. MetroCast is focused on providing superior local customer service and technical support, along with state-of-the-art technologies and advanced science offerings.

MetroCast is also a primary supporter of numerous local charities, organizations, events, and community projects, donating hundreds of thousands to (inaudible) of economies and communities in which the employees work, live, and provide service.

MetroCast networks are the most up to date of any of the networks. Our services areas are primarily in rural America. MetroCast has approximately 10,000 miles of plant in 9 states.

Our company average home pass density per mile of distribution plant is 38 homes a mile. MetroCast has made a business out of serving rural areas that were unserved or underserved, with competitive prices and flexible services.

MetroCast has a few areas of our -- homes that are -- isolated community because of geographical obstacles, such as bodies of water, national forest, and military bases. In these instances, we have been able to overcome most of these obstacles by partnering with the local communities and other service providers. Because of the commitment to our service and as a result of significant capital investment, by the end of this year one-tenth of a percent of our homes passed will be without enhanced broadband services. We would like to be able to provide enhanced broadband services to all of the communities we serve.

MetroCast currently is not applying for broadband stimulus. Just to clarify this statement, though, we are working in partnership

with communities we serve, and support for applications for broadband stimulus funds that could possibly result in public-private partnerships that we believe would improve and enhance middle and last mile networks, as well as meet the objectives of the economic stimulus plan.

Solutions. We believe that low interest loans that would be able to be subordinate to existing credit facilities, similar to the economic development bonds that were used in the 1980s, the early 1980s.

Also believe in middle mile grants that would allow for the interconnection of isolated communities that could be done in partnership with local communities. The middle mile grants allowing for this public-private partnership would allow for the communities to build out middle mile transport fiber and allow for operators to maintain and provide last mile services to the communities. It would also allow for the potential of better connectivity for the schools and government agencies.

And lastly, the expansion of USF funds to more providers and LECs. I think that everyone is aware that cable operators pay into the USF funds, and that our consumers receive no benefit for it. A lot of times we are competing against USF funds recipient companies, and our rates are lower than the company receiving USF funds. I think overall USF has worked though. But now it's just past its maturity and it needs to be revamped.

In closing, I think combining low interest subordinate loans, promoting and supporting public-private partnership grants, and expanding the Universal Service Fund would go a long way to solving the dilemma of the unserved and underserved markets.

MR. DILLNER: Thanks, Jim. Dave?

MR. BURSTEIN: Hi. Do I have a presentation? Should be there. I gave you two slides. I sent you two slides.

I can't -- obviously I don't.

MR. DILLNER: Let's go down to Ken and

then we'll come back to you.

MR. BURSTEIN: Okay.

SPEAKER: Just waiting for him to pop it up there.

MR. CARROLL: So, I'm Ken Carroll from -- I'm the president and COO of WildBlue Communications. I'm the lone wolf on this panel; I represent satellite. So hopefully, these guys won't be too hard on me.

Just very quickly to -- satellite is integral, I believe, to, really, the rural broadband markets in play, to provide an economic viable solution to those customers in those areas. Today the marketplace -- between WildBlue and HNS, those are the two primary providers of satellite broadband.

There are over a million -- or approximately a million customers out in the marketplace. I anticipate, with the new, next generation development technology, both on the satellite and on the ground segment platforms, you know, that in 5 to 7 years that there will be

close to 5 million satellite broadband consumers out there in the marketplace. Again, primarily serving rural, unserved, and underserved marketplaces that we see today.

The unique features of satellite are that it does provide ubiquitous service once the satellite's up and the gateways are built. You can reach and touch essentially every potential customer in the United States. So, again, it's very cost-efficient. It really doesn't cost that much more to go out and install a customer in a suburban area versus in a rural area. It's just extra windshield time for the installer to go do that. The equipment and the infrastructure is already built, equal cost across the board.

And, you know, it really is -- the economics and costs are, you know, independent of the population densities that drive a lot of the economics from wired line or even, to a certain extent, wireless applications. And fortunate for us, we don't run into some of middle mile issues that the rest of the wireless industry does.

Because we have gateways, we're able to aggregate traffic and usually locate those in competitive fiber market areas, so we get the best pricing on that "middle mile."

I think, you know, when you look at satellite, I think you have to understand that it is a fairly nascent technology as it relates to satellite broadband. It's really -- we operate today on our first generation platform. The next generation platforms out there bring significantly more capacity and speed to the marketplaces. Our two satellites today combine to generate about 10 gigabits' worth of capacity. The next generation satellites bring to the table -- each satellite brings approximately 100 gigabits. So you can see speeds of 10 to 15 megabits in the service offerings and significantly more volume throughput to each and every consumer.

Very quickly, just looking at how satellite broadband works, for those of you that don't know. It is, you know, a modem just like everybody else has, which attaches to an antenna

which both transmits and receives data, but it's similar to what you would see with a DBS video provider. That transmits to the satellite, comes down to the head-end gear and then goes out to the Internet, information is retrieved, and basically the information flows back up through that same process.

So, when I looked at, you know, what the FCC is trying to do in coming up with policies and rules around getting more to the unserved and underserved marketplace, I think it's critical that they maintain technology neutrality.

I don't think -- you know, you have to be very cognizant -- and I wouldn't want your jobs, in this respect, in that being -- setting up rules and policies may inadvertently harm or damage the interest of a different technology to go out and really be innovative and make changes to better serve the constituents in the United States.

You know, we also are active in the stimulus area. And, you know, we've had -- it's

easy to map if you have one or two counties. But mapping for the stimulus when you have 3,100 areas and have to carve out service areas is a monumental task for a smaller company like ourselves.

You need to balance economics versus service capabilities. I wouldn't focus necessarily on giving everybody the best, but get people the better. And I think you have to take into effect different -- where people are on their evolution technology -- or evolutionary paths as it relates to technology.

MR. DILLNER: Thanks. We'll come back to Dave Burstein, if you're ready?

MR. BURSTEIN: Hi. Okay. I've been writing about this stuff at DSL Prime since 1999. I'm a geek, not a wonk.

And I'm really glad to see in the audience -- is Stagg -- Stagg is still here, yes? Yes, there's Stagg. Stagg is unlike almost anybody else in authority and in policy. He's a fine train engineer. And one of the key things

that is going wrong with U.S. policy is that there are a pile of brilliant, well-informed, highly-motivated lawyers and policy people, but some of the problems don't get solved by first principle and rules and regulations, but you have to work upwards from the networks.

Half the solution to the broadband problem in the U.S. is on either side from me. One or 2 percent of the population is going to cost 10- to 50- or $91,000 to serve with a landline. It's not for me to decide whether that's worthwhile. But it's likely that we're going to have that remnant at the end, and giving them better satellite is a key way to serve those folks.

On my right is a cable guy, a small cable guy. It turns out that the most important thing to do with the broadband stimulus money is get the small cable guys to upgrade to data. There are somewhere on the order of 4 million homes in the U.S. that can get cable TV, but not cable data. It would cost less than $400 to

upgrade most of them. That's 30 to 50 percent of the actual unserved. For a quarter of the $7.2 billion stimulus, you can eliminate 30 or 40 percent of the problem. It is ridiculous that the folks in Washington haven't put that together and figured out how to make that work in policy. But I'll leave that to you guys.

But before I do, I sat here all day listening to things that half the people on the panel could have written for each other and most of the people in the audience knew. So let me get a sense of what we know is going on.

Okay. First question. Will everybody raise their hands who think that by 2010 and 2011, 60 percent of the U.S. Will be able to get 50 megabits?

Anybody who didn't raise their hand should probably not be making policy until you've spent two weeks learning about what's actually going on outside Washington, D.C.

DOCSIS 3.0 is a solid 50 megabits. They're going to start the upstream next year.

Comcast has now deployed it to 25 million homes or so. With Comcast going to nearly 50 million homes -- Cablevision and others, we are going to have plenty of speed for most of the folks. By 2012 to 2013, 90 percent of the U.S. will be able to get 50 meg. That's without a penny of stimulus.

Second, how many people think that by around 2013, percent of the U.S. will be able to get 4 to 10 megabits?

We just sat through a panel where Verizon said they were going to do 92 percent on their own. And the other folks will probably get a few points more. That, among other things, makes it ridiculous to do 7 megabit DSL with any kind of government money or stimulus in any place where they're going to get it wireless.

Third, very few people are unserved, other than by satellite, in this country. The real number is somewhere between 4 and 7 percent, by the best available number. You have to start by looking at what -- who these people are and what they are doing, and figure out the best way

to get there. Forget technology neutrality. Do pick a winner, if there's one that's going to be $300 of public money instead of $3,000 of public money and is about the same.

Because that's my last question to throw out at you guys. How many of you people think that it is practical for 98 to 99 percent of the U.S. to get megabit speeds around 2011?

It's an engineer here on the panel. Any competent engineer in communications, the CTO of Comcast or of AT&T, could easily make that happen with the $7.2 billion. When you look at the opportunities that are out there, the number who can be reached with cable, with some wireless towers, and so on, you get from 92 to 95, or 94 -- yes, whichever, to 98 percent just fine for less than $7 billion.

How to make that happen? I am just about out of time.

I do have to say one other thing beside that -- I -- all the presentation is there. I earn my living from DSL Prime, newsletter

reporter. I sell ads to a lot of people who make chips and equipment to sell in the industry. I get miscellaneous gigs related to that, of conferences and so on.

I did a little bit of consulting on broadband to -- for Montel, who is putting in a proposal. I don't have any interesting financial ties to any of the companies involved. And frankly, I think anybody in policy who doesn't tell you things like that up front is somebody you should think twice about believing.

Sorry I went over.

MR. DILLNER: Thanks, Dave. Mark Cooper?

MR. COOPER: To answer four questions in five minutes, I will have to keep it simple. Who is not served in America today? Why don't they have service? What difference does it make? And how should we advance universal service?

Who is not served? Any household that does not have Internet service at home in America is unserved. Any household that does not have

broadband is underserved. The metric of success in the realm of universal service is uptake. Actual people getting actual service. The Commission should immediately and permanently put an end to the game of claiming that it has done its job if someone in the ZIP code or the local library has service.

I make that statement because the answer to the second question, why don't they have service, is actually quite clear. The vast majority of households that do not have service would take it if service were available to them at rates they could afford. Affordability lies at the intersection of price and income. Other things matter, too, skill and interest. But according to the most recent data from the NTIA, urban households with incomes above $25,000 were 2.5 times more likely to have broadband than urban households with incomes below $25,000, and 4 times as likely to have broadband as rural, low-income households. The reason is that low-income households cannot afford broadband, and it is

expensive or not available in rural areas. You can search high and low for other factors, but none will come close to these critical factors in explaining who is not served.

Well, what difference does it make if you don't have service? Those who are disconnected are disadvantaged and disenfranchised, unable to participate fully in the economic, social, civic, and political life of 21st century America. Households with broadband and without broadband are exactly as likely to participate in physical space, in information gathering, political activity, social gathering, writing letters to the editor, petitioning their friends. But households that have broadband are four times as likely to engage in those activities in cyberspace as people who don't. Simply put, those who do not have broadband are cutoff from the growing digital public sphere. Denied the personal productivity tools and economic opportunities of cyberspace, their life chances and well-being are constrained. That is why we

must stop talking about the digital divide and swiftly act to do something about it.

My last question: How should we advance universal service? The first sentence of the Communications Act sets the primary purpose of the Federal Communications Commission:

"To make available to all people of the United States, without discrimination on the basis of race, color, religion, national origin, or sex, a rapid, efficient nationwide and worldwide wire and radio communication service with adequate facilities at reasonable charges."

The explicit tools to achieve this goal are provided to the Commission in Section 254. The FCC should immediately declare broadband a universal service under Section 254 and reorient the universal service mechanisms -- lifeline, linkup, the High Cost Fund, et cetera -- to provide adequate broadband facilities -- and notice the adjective: Adequate broadband facilities -- at reasonable charges.

How do we do that? We know how. We

should subsidize the cost in rural areas and subsidize rates for low-income households nationwide.

If the Commission did that, to say that it would be a change from the past Commission is a remarkable understatement. The previous administration did not give a hoot about universal service and proved it by refusing to take any action whatsoever to address the digital divide in America.

If the Commission quickly acts and dedicates itself to providing least cost, basic broadband connectivity that meets the real needs of real people, it will be able to bring broadband penetration to the level of telephone penetration within half a decade. No matter what else the Commission does in the years ahead, if it fails to achieve the goal of universal service, it will fail -- will have failed to shoulder its most important responsibility under the Communications Act.

MR. DILLNER: Thank you. We'll now move

on to Gary Evans.

MR. EVANS: Thank you. I'm Gary Evans, president and CEO of Hiawatha Broadband in Southeastern Minnesota. And if Jim's company is small, I'm very tiny. Companies like mine and people like me from small town America don't get many chances to speak to the FCC and almost never in circumstances as important as today. So I thank you for letting the voice of a tiny provider be heard.

As you develop new policy, I would like you to remember four simple points, if you will. First, that there is in rural America appetite and a market for broadband services. Second, rural America is not a wasteland. In fact, it's very fertile ground for application development. There is a magic formula for success, but it's more than 70 years old, and the value proposition has less to do with price than you might imagine.

First, appetite. From Main Street to farm fields, everyone is hungry for the information that advanced connectivity can bring.

Gone, too, is the day when rural Americans will compete for access to a dial-up system. To illustrate my point, Hiawatha Broadband began in 1993 as a not-for-profit project known as Luminet that connected education, health care, and government facilities in Winona with fiber. Because of community demand, it also became one of the country's first small town Internet service providers, and we were forced to grow up quickly. Internet take rates in the mid-1990s stunned us. Luminet's e-mail addresses, for instance, topped 50 percent of the Winona area's 35,000 resident population.

Point number two, rural America is fertile ground for the development of useful applications. As Luminet unfolded, we invested 600,000 in an applications grant program. We got great proposals, and consumer demand for the applications developed grew exponentially.

We received a helping hand from Kansas City when Cerner Corporation, after finding out Winona had a broadband network, made the community

its alpha site for new health care technology projects. The community now has a full electronic medical record, and a full online personal health record used by thousands of Winonans, that is at their discretion available to family members and providers anywhere in the world.

The applications make quality of life better, but they require big bandwidth. We now deploy fiber because we believe it is the medium that does the best job.

When Luminet, in 1997, turned into the for-profit Hiawatha Broadband, its first effort was to build a new network in Winona, a hybrid fiber-coax plant. St. Charles followed as another HFC build. But as new applications emerged and costs fell, we went exclusively to fiber for the important reasons of we'd not yet found an application that can't be accommodated on it, fiber costs have fallen dramatically, and maintenance costs in a passive optical plant are almost nonexistent.

And then there's the magic formula. We

have drawn attention because all of our communities are larger now than when our networks were built. HBC has prospered too. Our take rates are disbelieved by almost everyone and are now being studied by two national groups. Everyone is looking for the magic formula. I said there is one. I also noted that it's more than 70 years old. It's about doing things the way they once were done, when Main Street, U.S.A., in towns across the country, no matter how small, bustled. That's what we do. We open local offices, staff them with local people.

Point number four. The value proposition is not about price. First, the take rates: Internet, 83 percent; telephone, 65; cable, 75. And please note that we're not the low price provider in any market we serve. In my opinion, those who use price as the single most important variable err. So, too, do those who think adoption is all about price. I think it's about service quality.

So as you develop your policy, please

remember that rural Americans desperately want connectivity, that it's fertile territory for application development, that there is a magic formula, and that price is not the variable that counts the most.

MR. DILLNER: Thank you. George Ford?

MR. FORD: Most of the things I would talk about have been discussed by some of the earlier panelists.

The issue here is unserved households in the United States. The first question you have to ask is why aren't they served, and the question is fairly obvious. We have an investment problem. We don't have a network neutrality problem or a public policy problem or a Swedish problem or a Korean problem, we have an investment problem.

And the investment problem stems from a -- very simple mathematics: Either the demand is too low, the cost is too high, or the ability of firms to convert surplus into profits is too low. Okay. That's -- those are the fundamental pieces of an investment decision.

And the modern theory of investment, the economic theory, is called the Cue Theory of Investment. The cue ratio is the ratio of an entity's worth relative to its replacement cost, and also an indicator of market power. The larger the cue ratio, the more investment there is. Without margins, there is no profit -- without margins, there is no investment. Okay. That's how you fund investment, is through positive margins, even though they're typically viewed as the product of Satan in public policy debates.

It's probably best to think -- and I think this is very useful for public policy -- is to think of the investment problem as the research and development problem. They're very much the same. We have enormous benefits from research and development, but people don't have the proper incentives to invest as much as they should. So what do we do? Well, we subsidize them and we give them monopolies. Why? To increase the extraction rate of surplus to the firm to justify the investment.

If we were to raise R&D subsidies and reduce patent length by half, what effect would happen to R&D investment? I don't know. Okay. I don't know what would happen. But that's kind of what we're doing here. We're saying we're going to throw $7 billion at the problem. Oh, but by the way, we're going to tell you how to run your network, and what prices you can charge, and all those sorts of things which cut the extraction rate. So you have to be very careful that the policy doesn't actually reduce the effectiveness of the money that we spend.

The other issue is, is that the Commission or whoever's involved in this needs to be a bit agnostic about the number of firms that provide service. If a market is unserved or even underserved, what that implies is that the equilibrium number of firms, without intervention, is zero. Okay. Nobody's there to do it. Okay. Now, it would make absolutely no sense if you have to pay one firm to do it, to pay two firms to do it. Okay. So you have to get the competitive

issue sort of off the table in these unserved markets.

That presents an interesting problem -- that Dave brought up earlier -- that how do you pick the winners and the losers? That's a tricky issue. And you would do a cost- benefit analysis, like Dave said, you -- to do the one that provides the service for the cheapest, pretty much, or whatever service you find acceptable. That may be WildBlue in some markets or other satellite vendors. But you certainly do not -- it just never makes welfare sense; it does never improve the well-being of society to put two firms where even one couldn't survive. Okay. The subsidy required to support two firms is going to cost you more than the benefit from the competition.

Nor does it make sense to regulate prices in these markets because you think concentration is too high. If you impose a three firm equilibrium on a two firm equilibrium, you get a one firm equilibrium. Okay. You're going to force the exit of one of the players if you do

that and you'll end up with monopoly. And some people like regulated monopoly; they view that's fine. And they should be listened to. Maybe in some cases that's all right. I don't know. But that's what's going to happen. If you try to squeeze the profits of a concentrated market, you're going to get a more concentrated market. Okay. So be very careful of that.

The other recommendations, here in my last minute, is get the log out of your own eye first. Okay. The FCC needs to eliminate all rules that prohibit or impede secondary markets for spectrum. Just wipe them out. Get rid of them. Okay. Let's get that market going.

Tower siting, the reason you may have problems with exclusivity in tower siting is because tower siting space is so scarce because the government won't let you put them up. Okay. That creates an artificial scarcity in the asset, which makes people uncooperative. In the long-distance market, if you were stringing fiber, you'd call up all the carriers and say, hey, I'm

stringing fiber. You want me to lay some for you?

That doesn't seem like what competitors do, but that's the way it used to work because it wasn't such a scarce asset.

The other thing to think about, there's overhead to subsidies. Every $1 of subsidy costs you more than $1 in taxes or social cost. So be very careful with my money, please. The other one is that subsidies fall where they may, not where they're placed. Okay. There will be some error in the subsidy. There will be some things happening that we don't want to happen. That's part of the game. Okay.

And finally, broadband consists of two pieces: Productivity, or externality, and consumption. We should not subsidize consumption. Okay. As the ratio of consumption to productivity rises, the optimal subsidy declines. So let's -- 100 channels of HDTV is not a worthwhile social project, in my opinion.

Thanks.

MR. DILLNER: Thank you, George. Mark

Gailey.

MR. GAILEY: I'm Mark Gailey, president and general manager of Totah Communications, chairman of the board of OPASTCO, board member of WTA. I serve on a state board in Oklahoma, the Oklahoma Telephone Association, and a state board in Kansas, the Kansas Telecommunications Industry Association, and various other economic boards around the area of where I live.

Briefly, I want to give you a history of the company that I am representing. My grandparents started our company, along with another individual, in 1954, basically to serve areas that no one was serving with telecommunications service, telephone service. I do not see a huge disconnect with what we're discussing here today on unserved and underserved.

There are individuals willing to serve areas as long as they can get a return on their investment. You know.

We've kind of talked about that today, too. My company -- you guys are talking about

small -- I have 3,000 telephone customers. I have three customers per square mile, or less.

Today, our technology is wired telephone service, along with wired DSL. We are applying for some stimulus monies to help push fiber further out into our network.

I understand some of the technologies that have been spoken about already. I understand their -- what they can do and the quickness to market that some of them can be.

But we also need to be cognizant of the limitations of some of the technologies that we're talking about putting forth.

So while, you know, we're getting into the discussion of unserved, underserved, and how to get people to take it, we also have to remember there are people that economically can't afford to take it. We've got to make sure that we are paying attention to those individuals and helping them get the services that they need.

I've got five children. Increasingly, my children are sent home to do homework on the

computer, on the Internet. Without a service provider for that service, they couldn't do their homework. We're also in a very economically challenged area, and I wonder many times how some of the students in the schools can go home and do the schoolwork without computers. And basically the way that happens is the school allows those children to go to the computer lab during school hours to do their schoolwork, and my children don't go to this computer lab to do their schoolwork because their parents are fortunate enough to own a computer and they can work from home.

So we've got to remain cognizant of what we're out here for. The Universal Service Program, in my opinion, has been greatly -- a great success. Broadband, we need to look at some way of helping to subsidize the costs where it doesn't make sense to have more than one competitor out there. I've lived under the regulated monopoly scenario. I personally think it works. I personally think that we can make it

work. And I'm not adamantly opposed to the idea of regulating price and quality of service. But we also have to remember that the farmers in rural America need just as much bandwidth as individuals in metropolitan areas because they also need to check prices of their crops and prices of futures, on and on and on, so.

We need to make sure we do not create something that -- a United States where there are the haves and have nots, and it's because of public policy.

Thank you.

MR. DILLNER: Thanks, Mark. Brett? Brett Glass.

MR. GLASS: Are my slides ready?

MR. DILLNER: Slides are coming up in just a second.

Can you just reset the --

MR. GLASS: Okay, my name is Brett Glass and I am the founder and owner of Lariat.net, which is the world's first wireless ISP, or WISP, as they sometimes call them.

And here's the information. You can find these slides online if you're interested. And also there's my contact information.

Next slide, please. I am an electrical engineer. I got my bachelor's from Case Tech, my master's from Stanford. And I founded Lariat as a nonprofit, very much like Hiawatha got started. It was a nonprofit co-op and the purpose of it was to bring high-speed Internet to Laramie, Wyoming. The difference was that, you know, most people now are thinking of getting, you know, getting broadband, the 768K now, as, you know, as bringing it to unserved areas. Back then, we brought it in at 2 megabits per second, and this was 1992 when we founded it. So, I guess we had slightly higher standards for performance back then.

It operated -- Lariat operated as a co-op until 2003 when the membership prevailed upon me and my wife to take it private so that we'd get private capital investment.

And we've been running it as a private ISP ever since. It's been my personal mission for

17 years to deploy broadband to underserved areas. And we've been growing every year by about the size of the District of Columbia, that's several -- and about 12 times the size of Manhattan, every year.

Next slide. Now, I was asked to bring some specific numbers here. And Blair Levin, in some of his comments, said that he wanted to see hard numbers, very detailed data.

Here is, very quickly, a 30-second case study. We went -- we rolled out broadband in the whistle stop -- it doesn't even really rate as a town -- called Howell, Wyoming.

Here's a list of our nonrecurring expenses. You can see that we went ahead, we found a rancher who raises rodeo bulls. We put an antenna on top of his barn. I personally fabricated the metal to do this and forged and welded it. We got the whole thing done for $3,110 and we covered 40-plus square miles.

Now, this is going to vary in different situations depending on how far you're going, but

think about that for a minute. It means that basically we did this for under $100 per square mile, which is pretty incredible. Fiber can't beat -- nothing else can touch this except maybe satellite because you don't have to deploy more infrastructure to get there. But if you're looking -- if you're talking about terrestrial broadband, there is absolutely nothing that's more efficient or less expensive to deploy. And I could go into it during the questions and answers, or offline with the staff I can go into exactly how this works and what it does and how it performs.

Next slide. Now, we do have some barriers to deployment. The -- right now, we have -- pretty much despair of getting a license under -- spectrum under the current auction regime, so we operate entirely on Part 15 unlicensed spectrum. The auction scheme seems almost setup in every possible way to preclude small operators from being able to get good spectrum. We actually enrolled in the 700 megahertz auction, but we

might as well not have bothered.

So we're stuck on Part 15 spectrum. The interference limits our coverage and limits this ability of the network. We do everything we can to avoid problems with that. We over-engineer everything. But we have situations where, for example, Walmart interferes with customers beyond the edge of town because, as you know, Walmarts are usually positioned on the edge of town. And what's more, it also interferes with its own wireless broadband which we provide to it. We have -- this is true.

The -- we can't -- 3650, we're in an exclusion zone; we can't use it. And we have problems with getting reasonably priced Internet bandwidth because of the problems with special access and the very high price of back haul.

We also are very concerned about regulation of our network management practices and we hope that the broadband plan does not include these. Because right now we do have to ration our bandwidth to give our customers good prices. And

if we were forced to manage our network in a way that wouldn't allow that rationing, then basically they would either have to pay higher prices or the performance would degrade significantly.

Next slide. Now, here are a list of concrete suggestions for the broadband plan, things that I think would help people like me, lots of small businesses all over the country -- there are more than 4,000 of us -- to apply broadband more effectively.

We need spectrum. Here are some suggestions for where to get it. And we could -- if we go ahead and we license this nonexclusively, then one carrier won't use it all up. We can use cognitive radio to make sure this -- that it's used fairly and that no one hogs it all. We could do tremendous things if we open up the spectrum.

We could open up some of the spectrum which has already been dedicated to wireless broadband. 3650 MHz, I can't use this, but other WISPs can. It's sitting there fallow right now. The FCC has not released it.

We can increase power limits for Part 15 so that we can get over the noise a bit in rural areas.

We need to be careful about our definition of broadband. Don't define it to make it unaffordable when the backbone bandwidth costs are high.

Again, don't prohibit network management techniques that are needed to ration bandwidth.

Fix the problems in the special access market. Fix the broken middle mile problem. And, if possible, incent nationwide fiber backbone providers to offer access at amplifier sites.

And finally, ensure that the broadband mapping is not done in such a way as to expose small companies and small competitors' data such that large competitors can stomp on them; and if they get the data and it's all laid out for them, they can.

Anyway, I'm out of time. So please ask me more during the question period. Thank you.

MR. DILLNER: Thanks, Brett. Our last

panelist, Frank Schueneman.

MR. SCHUENEMAN: Hi, everybody. My name's Frank Schueneman. I'm senior vice president, Windstream Communications. I head up the network engineering and planning functions at the company. Prior to that, I worked at Alltel Wireless and was involved with engineering and operations of wireless networks. So I feel like I've got a reasonable view of both sides of the wireless and wireline debate, if you will.

So thanks for putting this panel on. I think it'll be very interesting.

Just a little bit about Windstream, at this point. We're an S&P 500 company. We serve about 3 million access lines across 16 states. Our customer concentration is about 18.6 per square mile. Much less than that in the areas we're talking about relative to broadband underserved. Probably more in the line of Mark's operation, and a three, five, eight would not be out of the ordinary by any means.

We're a $3.1 billion revenue company.

However, only 3 percent of that comes from universal service support.

So we really rely on the normal revenue streams there. Broadband is available to about 88 percent of our access lines, that's over a million broadband customers. And that's up from about 300,000 five years ago. Our take rate pretty much leads the industry at about 50 percent of residential access lines also take our broadband service, and we offer speeds from 1.5 up to 12 meg. And about half of our customers are already at the 3 meg level, so that's increasing quickly and moving along nicely there.

So, when we think about how do we serve this last percent, you may recall we're at 88 percent addressability. Well, we're good businessmen. The first thing we need to do is find a way to increase revenue or reduce expenses, and we spend a lot of time doing that. And it's increasingly difficult to monetize the pipe to the home.

You know, we -- some of the debate on

net neutrality has to do with avoiding any usage-based pricing or monitoring or whatever. So that's an issue for us.

There are other emerging technologies that come out such as femtocells that are -- just happen on our network. And the capacity to operate those services -- it is no revenue generation for Windstream.

So it -- we always look for more products. And we're working real hard on that. But it's not an easy problem. It's not just Windstream's problem; it's the -- it's a local exchange carrier issue.

Next. You know, we need to cut expenses. And we work real hard on that. We work extensively with our vendors. You know. We've got DSLAMs that are down to the 24-line side -- size. And I can assure you we spend a lot of time doing that, as well. You know, we outsource where we can. And we always have to adjust the balance of providing a quality of service to the cost of doing so. As you know, a lot of customers have

problems with their internal computers and their own computers, and disconnecting from that and finally telling a customer, sorry, I can't help you anymore, is an issue we face every day.

We could charge more. But that's probably not a good thing because we're already at -- we're down to a decent price level of about 30 -- in the $30 range or so. And we think that given the take rates we have, it's stimulated good take rates, but we don't think that our last 12 percent can really support that level of monthly service fee.

So, what are some of the other options we have that the FCC may want to consider? Grants would be definitely preferable to Windstream as opposed to loans. A loan is really not of interest to us because when we think about deploying Capex in our network, why would we want to borrow the money and pay an interest rate as opposed to receiving the money, right? I mean, that's a pretty obvious one.

So, but we, you know, the point is, you

know, we're not -- we're just not interested in a loan program at this point in time.

So that would help on the supply side. On the demand side, I think that we could have some federally funded subsidies of ratepayer's -- of local services. And that would help, as one of the other panelists mentioned, stimulate demand in the broadband side, as well, in the rural sites. So that would help on the demand side.

So, I'm running low on time. I just want to say that as we've sat through some of the other panels today, one thing that seems to ring true and clear is having terrestrial connectivity in the rural parts of our country seems fundamental, not only to broadband DSL service, but also to the wireless -- offering of wireless services out there for back haul purposes. So I think it's a multifunction -- that it would -- that moving along in this direction on the wireline side would really help.

Okay. Those are my comments. Thanks.

MR. DILLNER: Okay. Thank you,

everybody, for your opening comments.

As you -- if you witnessed the earlier panels today, we'll try to prompt a useful discussion on the deployment of broadband networks in unserved and underserved areas.

I think that, really, a continuation of a theme that was asked in both prior panels, that I'd like to ask of the network operators here -- and some of you got to a bit of this in your slides. But just -- can you prioritize the top two or three barriers for you to deploy to that next 10 percent that you haven't yet reached. If you don't serve 100 percent of the subscribers in your area with broadband, if you offer other services, or what's it going to take for you to expand your territory if -- as Brett laid out. What's it going to take for you to go to that next neighborhood down the road or the next county down the road.

Brett, you seem anxious to answer this right away.

MR. GLASS: Yes, well, it did -- it

falls -- it follows directly on what I was saying.

The three things that we need are better access to backbone bandwidth, better access to spectrum, and better access to capital. And on the third point, the main way we could get better access to capital is if our investors aren't scared away by uncertainty or fears that bad things might happen to our business.

MR. CURTIS: You say more about access to backbone. Do you mean core into your one interconnection? Do you mean second mile? Do you mean both?

MR. GLASS: I mean -- well, okay. Our net cost, if you add the least lines plus the backbone charges for bandwidth right now, is $100 per megabit per second per month. Think about that. That means that if your standard for broadband is 768K, that means that if you want a user to be able to saturate that line, that's $76.80 per month. One of our previous panelists talked about problems with resistance due to pricing. That is high enough to cause a lot of

people to resist becoming part of the uptake --

MR. CURTIS: Could you pull that apart for me? Percentage -- so the 100 -- percentage that's -- core interconnection percentage that's second mile aggregation.

MR. GLASS: Okay. If I go to the major peering point in Denver, Colorado and I buy bandwidth, I can get it for as low as $3 or $4 a month per megabit per second if I buy it from a discounted carrier like Cogent. If I go for a, you know, a top-tier carrier, I might pay 12 to 18. All the rest is the back haul. All of the rest is the middle mile.

MR. CURTIS: Got it. So it's much more a middle mile problem than it is a core problem.

MR. GLASS: Absolutely.

MR. CURTIS: And so, you know, what specifically would you suggest we ought to think about doing to fix that?

MR. GLASS: Well, I prefer incentives to price regulation. I think the markets do a much better job of handling things, especially new

developments.

But right now we do have the problem that the reason why we can't get this is because there is a monopoly.

The ILEC in our area basically controls all of the paths. In fact, when -- if I call up the backbone providers, they try to, you know, they tell me to call the ILEC because they control all of the paths to that major backbone hub.

What's more, while we do have nationwide fiber backbones running through our community -- as a matter of fact, we have three of them -- they are all owned by a single large company that will not open any of them up to us on -- even though the fiber passes through. It's like the train passing through; it does not stop. There's no station. There's no on ramp. And as a result, we can't use that to circumvent the problem.

We need to see -- I'd like to see --

MR. CURTIS: So you'd like an access point, and you'd like reasonable terms and conditions on --

MR. GLASS: Well, I might as well name it because people can look it up. The company is Level 3. They bought Broadwing and Wiltel, which had the other two. And then they had their own fiber backbone through town. They will not open up any of them to us at any reasonable price, even though we've called them for the past 10 years asking.

And this is true in a lot of rural America. The fiber goes by; it doesn't stop. If we can incent -- I'd rather incent than force -- if we can incent them to open this up, a lot of the problem with the middle mile will go away.

MR. CURTIS: And why do you think they won't open it up?

MR. GLASS: I think it's a business plan problem. When you ask -- when you call the company and ask them, they say, I'm not allowed to sell this to you. Our business plan does not include serving rural America.

The business plan has essentially redlined us.

MS. MONTEITH: And what kind of incentives would you suggest?

MR. GLASS: Financial incentives would be the best thing. Some of these companies are not doing very well right now.

MR. CURTIS: The rest of you having the same issue?

MR. EVANS: In our case, bandwidth is not an issue. Okay, back haul, that's not a problem.

I think our biggest issue is finding an effective way to partner with a wireless company to do a better job in the far rural areas of our territory.

MR. CURTIS: So, not as a complement, but as a way of edging out?

MR. EVANS: As a -- actually, as a partner company that would allow us wirelessly to connect more people to the network.

MR. CURTIS: Access.

MR. EVANS: Yes.

MR. CURTIS: Yeah, okay.

MR. GAILEY: Bandwidth costs that I've seen for hauling back to the Internet have ranged from $220 to $250 a meg, down to $120 to $150 a meg.

MR. CURTIS: Down to?

MR. GAILEY: Down to. That's if you're buying large chunks.

MR. CURTIS: You should move to Wyoming; they've got a deal there.

MR. GAILEY: Yeah, apparently. But my customers don't want to go there. They like it where they live.

But that is a major problem. And I've got the -- I have two accessible points of getting bandwidth. But, you know, and then as we increase the minimum speed of bandwidth, then I've got to increase my back haul. Which, again, it's not an exponential double, I just doubled from a 20 meg pipe to a 40 meg pipe and it didn't double the cost, but it was still a very large cost per customer. I've only got 1,100 DSL customers on that bandwidth.

MR. CURTIS: Brett's seeing about 90 percent of his back haul cost in second mile. Are you seeing about 90 percent of your cost in second mile, as well? Or is there more -- or is the percentage of the total in the core?

MR. GAILEY: It's probably second haul because of being an ILEC I've got a different structure with USF and cost recovery availability and things of that nature through DSL and NECA tariff. So. The biggest driver for me right now is accessibility to the Internet cloud with a back haul.

MR. DILLNER: Dave, you wanted to respond.

MR. BURSTEIN: Yeah, there's something important here. It's easy to figure out what's going on. Bandwidth costs between about 5 and 15 bucks a megabit. There is an obvious monopoly or oligopoly -- massive take off some but not all rural areas, because there's very little -- the fiber is already in place. We have loads of fiber. The cost of running more bandwidth over

that fiber is very small. So it's just a market -- there's a clear market structure problem. It turns out to be more important in many places to get the bandwidth costs down than to subsidize for density, so we know that.

The reason I wanted to come in here: Is there two ways to do this that are practical? One way is to throw somewhere in the order of $20- to $30 billion to overbuilding the fiber that we already have in place that has more than enough capacity except in a few offshore islands in Alaska, which is the current plan in the Stimulus. It's throwing a billion dollars, it gets almost nowhere in the cost of building fiber.

Or, say we really do have a market failure problem. That if it's more than 30 bucks or so a megabit in the rural areas, the government should do the special access.

All of which is in the record, all of which could happen in a few weeks or a few months, and would do more for rural broadband than the $7 billion in the Stimulus because it turns out

that's the problem, the way it's going to be spent, or almost anything else on the table.

So, the middle mile is a real problem. You can throw a pile of government money at it somehow. You can turn around and say it really is a monopoly, and that's what we have regulation for. Which is right or wrong? You can decide that. But spending $20 billion to duplicate fiber is a hard one to justify.

MR. DILLNER: Jim, as you've deployed your -- and worked to upgrade cable systems that you've acquired, have you run into similar problems with access to connect your networks back to the Internet?

MR. BRUDER: Yes, we have. And just this year, we worked to resolve that. But what we did is we created a ring by leasing wavelengths from RCN and Cox, actually. And what we did then was we actually leased wavelengths, as well, into the major carrier hotels into New York and Virginia. So in essence we leased the transport and we became our own bandwidth provider. And

we've reduced our Internet costs, you know, I can't give out real numbers. But what we did is we -- for the same thing we were paying for before, now we get four times the bandwidth for the exact same price by doing that model. So we created the -- we solved the problem through transport.

SPEAKER: Frank?

SPEAKER: Yeah, okay.

SPEAKER: So, not to cut you short, Jim, but if could, kind of, speak for the midsize ILEC community.

The challenge that we have in the right order is first the local loop. The reason why we can't get to that last 18 percent, they -- those customers are farther than 18 kilofeet away from the next DSLAM, essentially. So, we need to shorten those loops.

And as soon as you do that, then the next problem becomes, or it can become in a high percentage of the cases, it becomes what you're calling the middle mile, and that is getting back

to your -- well, maybe not middle mile. I don't know what that term means exactly. But getting back from the DSLAM to your central office. And that's all, you know, internal within our network. Once we bring it on our network, we typically are fiber connected. Virtually all of our central offices are fiber connected. Some are islands, which raises -- islands not connected to our network, and that raises our transport cost. We have to lease capacity from another third party provider. So that raises our cost.

But in general, once you get into our central office, then you can get into our core network, you know. And we have POPs in Cleveland; Lexington -- or Louisville, Kentucky; Atlanta, Georgia; and Dallas, Texas, where we interface those big carrier hotels and we do get a very good price per megabit as far as handing off to the other big Internet national providers for Internet transport.

So, again, it's the local piece, followed shortly by the middle mile issue.

MR. DILLNER: Thanks. George, just following -- continuing the same conversation, from an economist's point of view, like, what's the analysis or what's the solution to this kind of price problem in rural America?

MR. FORD: Well, I mean, it's interesting to me how you get different answers from different people. Wildly different answers from different people. And it would be interesting to find out why you get such different answers from them. It may be a more urban style model versus a highly rural style model. Or it may be the state that you're operating in, or the carrier that provides the service, or whoever it may be.

I think that you have to think about what the costs of providing the service would be. I mean, if it's just so completely outrageous, then why doesn't somebody else do it? That's --

MR. DiMASO: Because that would require $20 million to build --

MR. FORD: I didn't -- hold on, hold on,

hold on, whoa, whoa, whoa.

MR. DILLNER: (inaudible) --

MR. FORD: Okay. Then if it costs $20 million to build, then why is it so completely outrageous to charge a high price for it? I mean, you have to kind of think about these things. Just because it's there doesn't mean it's cheap. At some point, somebody had to make that investment decision based on an expected flow of revenue from that circuit, okay?

These things need to be investigated. I don't really know what's going on. I mean, Brett is a good -- certainly a good resource for that because he is a very clean example of what's going on, and he also has the benefit of Level 3 being there and not getting that interconnection, which is a very interesting case.

But I don't think that -- is it a structural problem? Well, we've got duopoly here. Is that a big issue?

Can regulation really make it -- improve things from that perspective? If we go slicing

and dicing too aggressively, are we going to have anything? And if we don't have anybody doing anything other than the fact we've just exploited the fact that they sunk their cost, and we're going to now essentially tell them what their price will be since they've sunk it and it's there, okay, which will discourage investment in the future by any other firm who thinks they're going to have their sunk cost confiscated.

You know, these are complicated. But it's not so easy to say price is high, this is horrible. Okay. Or price is high, this is a market structure problem. We can't say that. Brett's a monopolist; are we complaining about what he's doing? I mean, you know, his goal is to provide service to people, okay, as a nonprofit. He was encouraged to not be a nonprofit so he could get equity capital.

I mean, these -- this is not as simple as it looks. Okay. But I know that guys like this can certainly help understand the problem at a highly detailed level, which is obviously

necessary.

MR. DILLNER: Thanks, George. I think Mark, and then Ken. Go ahead.

MR. COOPER: One point on this question of -- we have to look at it. I think the special -- and Dave Burstein mentioned it -- the evidence in the special access case, I think, is crystal clear. It's been sitting there for years.

You can look at excess profits and see it. You can see a rate of return on investment that's through the roof. There are standard measures of market power. They exist. Brett has given you the, sort of, the underbelly of that, when you call up and you can't get a price quoted to you because you're a captive. So that -- and Dave Burstein's message needs to be clearer.

SPEAKER: I'm sorry.

MR. COOPER: The special access docket is done, right in order, and fixed the market failure. Now, George may disagree, but he apparently hasn't read the docket. But you've heard everyone here talk about that problem in

that docket. And so the answer is clear: It's done; you've got the record; fix it. And that would be one of your first steps in addition to declaring broadband a universal service, which will cause all kinds of other proceedings. But Dave needed to be clearer. You've got the evidence; you can write the order.

MR. DILLNER: Ken, did you want to?

MR. CARROLL: Sure, yeah. I think as you look at it -- and we operate, you know, obviously, in a competitive marketplace. And I think, you know, these access issues, you know, to a certain extent are driven by, you know, sunk costs that are out there. And I think -- and just like it's hard for all of us to reach farther and farther out with our network, whether it's wired, wireless, or whatever. So I think you reach a certain point where, you know, maybe that technology doesn't get you there because of the interplay of all those costs.

And I think, you know, obviously that is one of the reasons satellite has been successful

recently in bringing broadband to those marketplaces, because we don't have to deal with those issues. We have other issues, sure.

But, you know, I think our fundamental issue as we look at this is financing to grow the capacity.

I mean, we, you know, every time we bring capacity to the marketplace, we sell it out because, you know, there is a high demand. I think we've all spoken that these rural markets, you know, are just as interested or probably more interested in getting broadband because of where they live. It connects them to the bigger world and the bigger society that they don't necessarily see every day.

So I think you've got to, as you look at things, you've got to say, okay, where -- what's this market? What's the homes for passed -- homes passed, or homes per square mile? And how do you -- what technology fits that the best to deliver a true broadband service to those consumers?

MR. DILLNER: I thought I'd shift up the

discussion --

MR. CURTIS: Before we shift, so --

MR. DILLNER: Okay.

MR. CURTIS: Frank, it's my understanding, is you've got a -- it sounds like you've got a ring connecting most of your COs, yes?

SPEAKER: Yes.

MR. SCHUENEMAN: Yes, we've got a ring -- I guess you would call it a core. We got a, you know, a 10-gig core that basically connects all of our major hubs together.

MR. CURTIS: So, without knowing how you think about interconnection, and even if you do, for a guy like Brett, I'm just curious, is the closest thing we have to a -- the representative of the guy that Brett wants to buy interconnection from and get back home, since you're sitting next to each other, as well, how do you think about back haul for -- or would you think about, hypothetically, back haul for people who are adjacent to your network?

MR. SCHUENEMAN: It's not a business we're in now. Right off the bat, I don't see any major impediments to it. It's, you know, it's a price and cost issue, of course.

And, you know, let me just say something quickly about our core. It's kind of a virtual core in that we're leasing circuits from other providers. We're leasing LAMDAs, et cetera, so it's got a high cost to do that. We don't have a national fiber network or anything like that.

MR. CURTIS: Sure.

MR. SCHUENEMAN: Okay?

MR. CURTIS: Okay.

MR. GLASS: Just two quick points, because I'm sure we don't want to dwell on this for the entire panel.

The first point is, why, you know, the question that needs to be answered is why is it infeasible to duplicate the infrastructure that already exists? Why can't we just duplicate Qwest fiber; run our own fiber?

The answer is, unfortunately, that first

of all, that fiber was subsidized in two ways, and two subsidies that we won't get. The first was by Universal Service Fund, the government -- direct government subsidies.

And the second was by monopoly rents. A second, you know, a new entrant doesn't have the advantage of being able to use monopoly rents to subsidize their infrastructure.

This is a reason why nobody has overbuilt alongside the existing infrastructure. It is just -- there is no business case for doing it.

As a result, the only way that you can get -- fix the market, unfortunately, one of two -- is in one of two ways. Either you have to heavily subsidize the competition, at least as heavily as you subsidized the original build out, or you have to cap prices, which is something you don't want to do, but it may -- if you can't fix the market, that may be the only thing you can do.

MR. DILLNER: Okay. Yeah. I think we can shift the conversation.

One thing I just wanted to -- I noted that, Gary Evans, you started out with a nonprofit business that was tasked with tying together key community institutions. And maybe you can talk very briefly about that.

And I was just wondering if the other providers, how they've worked with key community institutions, too, and how that impacts your ideas about rolling out initially and rolling out to the areas that you don't serve, and then -- or expanding into new territories, so.

MR. EVANS: It's pretty interesting for me to think back to Luminet, which really began to be thought about in 1992. And if you take yourself back there, I'm guessing that most of us weren't using the Internet in 1992. Or if we were, we were probably accessing it through a toll call to AOL in Chicago; at least you were if you lived in the Midwest.

We were just fortunate that Fastenal Company, which is now a multinational corporation, decided that it wanted to do something to make

sure that the reach of teaching and learning was harnessed to the new technology, and we were asked to put the network in place for that reason.

Along the way, we created I think it was eight user groups, one of which was data Internet. And I still remember vividly my current VP for technology, who was then at Winona State University, coming to me after the first meeting, saying, Gary, can we use some Somsen Auditorium for our next meeting?

That was stunning because Somsen seated 900 people. He had more than 600 people show up for his user group meeting. It was indicative, I think, of the appetite, at least, pent up that was there.

And quickly, as we began to deploy and utilize the not-for-profit network, the community at large began to clamor for a network that they, too, could access. And so we made a decision in '97 to build that network for three very specific reasons. The first, to continue Luminet's education mission. Actually, 40 percent of my

company is owned by the not-for-profit community in Winona.

Secondly, to put into place a state of the art network because the incumbents had said they weren't going to do it. And that was for economic development reasons.

And thirdly, we wanted to compete with the monopolies. So today, I feel at least compelled for them to have at least one customer left in each market we serve.

But we discovered that the appetite out there is huge. There is a great interest in using the technology that's developed. And if I think the explanations are clear and right, there isn't very much opposition to paying for the services that are available.

MR. COOPER: I really do want to offer -- I realize that my metrics are radically different than the metrics you've been dealing with all day, of homes passed, is basically what you've been asking.

But -- and Gary, actually, we actually

agree. Gary gave me two numbers. He gave me the two key numbers for my metrics. Seventeen percent of his customers are unserved, and thirty percent are underserved. And I think I caught the number go by. Frank told me that 50 percent are underserved, out of a 50 percent take rate on broadband, as I understood it.

MR. SCHUENEMAN: No, no.

MR. COOPER: What was it?

MR. SCHUENEMAN: No, we're at about, I would say, percent can receive --

MR. COOPER: Eighty -- no, that's passed. How many people -- you said 50 percent take the service.

MR. SCHUENEMAN: Well, but you can't count take rate. I mean, that's --

MR. COOPER: I certainly can count take rate because ultimately that's what your --

MR. SCHUENEMAN: Well, that --

MR. COOPER: But I'm just -- I'm making my point.

MR. SCHUENEMAN: Well, but --

MR. COOPER: Eighty-eight percent pass, but only percent take service.

MR. SCHUENEMAN: Right. That's their call though. I mean, so --

MR. COOPER: That's their call --

MR. SCHUENEMAN: Okay. Okay.

MR. COOPER: -- given your price and their --

MR. SCHUENEMAN: Price it around $30 a month --

MR. COOPER: That's right. And --

MR. SCHUENEMAN: That's -- there's nothing exorbitant --

MR. COOPER: -- and you said that some of them can't afford it, and the FCC might use their Universal Service Fund --

MR. SCHUENEMAN: Yes.

MR. COOPER: -- to help. And Mark, I think, was it at -- a 30 --

MR. SCHUENEMAN: Just to clarify --

MR. DILLNER: Wait, wait, wait.

SPEAKER: I'm sorry.

MR. DILLNER: Wait until he finishes, and then --

MR. COOPER: Well, and so, and the -- I think Mark told me that about 1,100 -- he had 1,100 broadband subscribers out of about 3,000. So that's about a 60 percent underserved population. So, the metrics --

MR. GAILEY: I can reach 95 percent of --

MR. COOPER: You pass. That's -- see, that's exactly the point I want to make, here --

SPEAKER: Yeah --

MR. COOPER: Because you had a metric of who you pass, but universal service was about people taking service.

And so even though these companies have done a wonderful job passing people, we still have, in my -- by my metric, a universal service problem. Part of it is the ones we can't pass, which we address with the High Cost Fund. And a lot of it is the people who can't afford it, which we have traditionally addressed with --

MR. CURTIS: There's no question; there's two parts to the equation. Right? There's getting network past people.

SPEAKER: Yeah.

MR. CURTIS: And there's an adoption problem.

SPEAKER: Right.

MR. CURTIS: We have clearly, in this series of workshops today, been focused on deployment, e.g., getting people passed. There will be an upcoming number of these focused on adoption.

So point taken, agreed. But analytically, they're distinct problems -- distinct parts of the same problem.

SPEAKER: And --

MR. GAILEY: Well, you have to also remember that on the telephone side of the business, we've got a program that helps low-income families get a phone for the price that it is each month. We don't that today on the broadband. And I know the FCC's been looking at

it and working on it because when we had negotiation with the chairman last November, he was talking about it.

MR. SCHUENEMAN: So as you guys know, the NOFA came out, and the NOFA helped us -- helped define what the -- what underserved and unserved are. So it -- Mark, to your point, it is -- it really is all about homes passed -- or against your point, I was -- I guess. It's about homes passed, households passed, as opposed to take rates. So. And that's the prevailing definition.

MR. DILLNER: And I think Jim wanted to just respond to Mark for a second.

MR. BRUDER: And, Mark, I agree with you on USF. I think it should be expanded to include more people. But when we do that metric of, you know, whether it's Frank's company or our company, we have to also look at that, you know, there's other providers. So, you know, we might be 50 percent data penetrated, but, you know, we also have, you know, WildBlue is in our markets; we

also have DSL providers.

So you have to take the aggregate of all the providers providing the homes passed service.

But I agree with your comment on USF, that it should be expanded.

MR. DILLNER: Dave.

MR. BURSTEIN: Let me point out that we're ignoring here the fact that most of that money's being wasted, and an awful lot of it is going out as a higher price. And that is why demand does not stay separate from construction, because the costs are ultimately going to be a function of what and how.

Now, let me give you a couple of particulars in there, right now. Verizon was perfectly happy to sell DSL for $15 a few years ago. They're now charging 20-plus. Qwest has gone up to 25. Stagg was telling me before this meeting he thought cable cost less than DSL to provide, but I'm hearing most cable rates are 30 and 45.

So turning around and not saying we have

an obvious market failure that is leading to higher prices when the costs are going down, is ignoring the heart, by people who have come here and said, we want more subsidy.

Twelve percent is going to USF; twice as much is going to ICC. There's $20 billion worth of subsidy in the system already, and coming around and saying we solve it by more subsidy has a much better answer. Subsidize what we need. If we need to subsidize poor people, fine. If we need to subsidize rural, fine. But if we don't turn around and start by saying where are the costs, and doing something, we're throwing away public money and we have a $1.8 trillion deficit.

Related to which: cost. Most of the proposals that are going to -- that are likely to be funded by RUS and BTOP right now are coming in at two to five times what the same project would cost if the company wasn't getting government money. I don't know that for sure, but I've seen enough of them. And I've seen the process going through where there is no standard cost; there is

no simple way of checking whether the costs thrown in -- when Windstream comes in -- oh, I'll give you a real example. When AT&T --

MR. SCHUENEMAN: I'll give you a real example, too, Dave. I mean, that's --

MR. BURSTEIN: But I don't want to give you a hard time, because I happen to have a real example.

SPEAKER: Yeah.

MR. BURSTEIN: AT&T says that the project U-verse cost $300 per home fast, that's 25 megabit. In California, they just got subsidies approved on the basis of cost between 10- and $22,000 for something that, if they spent more than $1,000 doing it, they're totally incompetent, and AT&T is not incompetent.

So what I am saying is, part of what we want to do, if we want to help the poor people, is take these subsidies or the money we have and make sure we don't waste the bloody stuff. So that we can bring down, very quickly, this -- these things on demand are probably going to be almost

worthless because most of the people coming to talk on that are going to talk about how you say great things about broadband, and poor, old, and learning disabled people will find a way to pay $300 or $400 in order to get broadband because it's going to change their life.

This is nonsense. The ConnectKentucky data showed that they -- demand stimulus was a negative effect. I don't think anybody anywhere has any data about sustainable broadband that any of these programs giving middle class people money to tell poor people what to do makes a big difference. And we have a heck of a lot of data that it doesn't happen to work; right or wrong, empirical data, but you're also saying get data, it falls down.

So that when we do the demand, it turns out that the one thing that makes a big difference is price. And that's not at the top of the D.C. -- because very few people are willing to look the head of Comcast and AT&T in the eye and say, you're overcharging for this stuff, and we know

because the guys in France are making -- these belong on the table. That's why I was very glad and appreciate the fact I was allowed to talk to you guys and sorry I talked so much.

MR. DILLNER: I think Frank and Brett wanted to weigh in. Go ahead, Brett.

MR. GLASS: Okay. I just wanted to add that, you know, we have to talk about, you know, we've got two different -- Dave, you're touching on two different things: One is trying to incent adoption and the other is trying to incent build out to unserved areas. I think we need to treat these are very distinct issues.

In terms of solving the problem of incenting build out to unserved areas, I have a recommendation which I didn't put on the slides, so I'd just like to mention it. I don't think that the current structure that we have with the USF is going to do it. I think instead perhaps what we should do, at least in terms of broadband deployment, is forget about the USF approach and instead offer vouchers to unserved customers and

have them be able to offer this, take this voucher, bring it to an ISP and say, hey, if you will extend your network out to my area, you will get this voucher. And make it a valuable enough voucher that it's worth the ISP's time.

This is similar to the idea of the, again, the demand side of doing something like Section 8 housing, where instead of giving aid to the landlord and hoping that he'll build housing, you give the tenant a voucher and the tenant can then go and offer it to the landlord. This may be a more effective approach, at least in terms of incenting rollout.

I'm not sure what to do about adoption because you can lead a horse to water, but you can't always make them drink.

MR. FORD: Don't invite the Pennsylvania Dutch Telephone Company to one of these, please.

MR. SCHUENEMAN: I just want to respond. Dave, you kind of implied that somehow broadband stimulus applications may be inflated somehow.

MR. BURSTEIN: I didn't say yours.

MR. SCHUENEMAN: Okay, I appreciate that.

MR. BURSTEIN: I got an AT&T example on the record.

MR. SCHUENEMAN: Okay, okay.

MR. BURSTEIN: At the CPUC, but --

MR. SCHUENEMAN: Well, let me just give you assurances from one stream standpoint and I've been personally involved with that process. It's been a grueling process, very, very expensive process. And, you know, if I could carp a little bit, some of the timeframes have just been really, really tough. But I can tell you that we designed those network solutions with the same rigor and the same economy that we would have using, you know, our own capital, if you will. And there's absolutely no funny business going on there whatsoever, so.

MR. COOPER: I want to ask a question and it relates to something that George said earlier. So you said you prefer grants and everybody understands why. The questions I have

is if you get a grant to deploy that facility, that asset, it's my hope that you then don't try and earn a normal rate of return on that part of the asset because you actually didn't take any money out of your pocket and put it in the ground.

So the question is, is there anything in the application process that -- and so as a result of that, I sure would like to see when you calculate your cost of serving that last 12 percent and you've gotten a big, fat government grant, you then don't recover those costs a second time. Is there any way I can work that out?

MR. CURTIS: Fascinating, fascinating conversation. I'd like to get back to -- rather than talking about the NTIA Grant Program and how that is or isn't working, let's get back to what we can do, you know, amongst us to advance the problem of the unserved/underserved. You know, fascinating topic, don't want to minimize it. Probably a better forum at a different time.

MR. BURSTEIN: Can I suggest you do that by asking the cable people here what it would take

to get the cable -- he's built out everything. The other cable companies out there because that turns out to be one of the particular things.

MR. CURTIS: Actually I think I want to go a whole different direction for a little while and let's let this simmer for a little while. Let's talk about satellite for a little while.

What I would love to understand is kind of your capacity equation. There's a lot of folks that are unserved by traditional terrestrial service. If you suddenly found yourself sitting on a bunch of demand, you know, help me think through what that looks like for you. When do you need to start adding capacity in what blocks? What are your barriers? What are the key drivers of your cost model that, you know, we need to be thinking about in terms of, you know, your ability to soak a lot of demand?

MR. CARROLL: Sure. Well, I think, first of all, I would say specific to Wildblue, I would say today if we had additional capacity, we would probably have another 200,000 or so

customers. You know, even today --

MR. CURTIS: But you're currently capacity constrained.

MR. CARROLL: In certain parts of the country.

MR. CURTIS: Okay.

MR. CARROLL: In certain parts, primarily east of the Mississippi we have segments where we have suspended sales because we want to keep a quality of service that's acceptable to the consumer. So --

MR. CURTIS: And that -- then that capacity's on the satellite link or --

MR. CARROLL: That is on the satellite link.

MR. CURTIS: Okay.

MR. CARROLL: It's basically, you know, it's how much power, how big can you build a satellite? So if you -- you know as I mentioned earlier, we talked about first generation and that's really where we are. You know, the -- we have two satellites up: Wildblue 1, which has

about 6 gigabits of capacity; and (inaudible) 2, which has about 4 that we utilize to provide service here in the U.S. But the next generation technologies are birds that approach 100 gigabits of capacity. So you can see, you know, the -- you know, it's almost an exponential type growth in capacity, which, in turn, allows you to deliver 10 megabit type speeds.

So, you know, those are -- and our service capabilities are lumpy as far as increasing capacity because it's -- you know, we -- you know, satellites have been built for years and -- but it's still about a three-year process to complete and launch a satellite. And it's an investment of approximately, you know, 500 million today for that type of satellite, launch, insurance, and built out the network to support it. But from our estimation --

MR. CURTIS: That's per satellite.

MR. CARROLL: Per satellite.

MR. CURTIS: The cost of, you know, soup to nuts, getting a satellite from ground to orbit

in service.

MR. CARROLL: And build the gateways to support it. Okay?

MR. CURTIS: Okay.

MR. CARROLL: Everything but the CPE that goes to the consumer.

MR. CURTIS: Okay.

MR. CARROLL: And you conserve roughly -- how should I think about the capacity of that satellite?

MR. CURTIS: So I would say that, you know, we probably conserve a million and a half to 2 million consumers on that bird with, you know, approximately 40 kilobits per peak period.

MR. CARROLL: Okay.

MR. CURTIS: So substantially more than what the current satellite providers provide today. So it's a leap, a significant leap, in technology that really, I think, provides significant improvement and it's available to any consumer no matter how far out they are. Again, the only variable costs are it probably costs more

money to market to those areas because it's less dense, and an installer, you know, has to take -- you know, he might have 2 hours of windshield time versus 20 minutes if he's (inaudible).

MR. CARROLL: How close were you to install by mail, mail and drop?

MR. CURTIS: You know, actually the FCC requirements, mandates, since we're transmitting that it is a professional install.

MR. CARROLL: Got it.

MR. CURTIS: So --

MR. CARROLL: I'm new to this.

MR. CURTIS: Yes. And actually I appreciate being on the panel because I think that's one of the things that we certainly wanted to convey to the FCC is satellite --

MR. CARROLL: I mean, that's -- just guessing from other parts of businesses that I've looked at, that's a big driver of cost, especially if you're in a rural area or you've got a fair amount of windshield time.

MR. CURTIS: Yes, it is, but I would

say, you know, I would question whether we wouldn't do that anyway. I mean, if you look at the DBS guys, some of them first start out allowing self-install and ended up with some of the issues. They all do professional install.

But as you get the volume levels of a million, 2 million, you can start, you know, really impacting the cost of those things.

MR. BURSTEIN: And talk to me about the directionality of satellite. I assume it's highly asymmetric.

MR. CARROLL: Today, it is -- you know, basically we're about 25 percent up and 75 percent down, so, you know, a 1:3 ratio. But we're next generation satellites will be much more symmetrical as you move forward.

MR. BURSTEIN: Okay. And what about latency, particularly I'm just guessing again, I have a hard time supporting a good voice stream.

MR. CARROLL: So actually that's a misconception. I think today we could --

MR. BURSTEIN: Glad I asked.

MR. CARROLL: You know, we have done tests with (inaudible) and it works, I would say, similar to a cell phone application. You know, you're talking on a cell phone.

Our issue today is really capacity constraint. The current technology birds were built with bursty type, ask for this, get this, versus a constant extreme connection. So the next generation, you know, back to --

MR. DILLNER: What's the time horizon on the next generation?

MR. CARROLL: There are two birds currently being built. One will be available in approximately a year and a half, and then the next one is probably about 2-1/2 years away.

MR. DILLNER: Got it. And it sounds like there aren't levers that we should be thinking about speed to market, reduce costs, streamline, make your life simpler or it's an open invitation to tell me what we should be doing.

MR. CARROLL: Yeah, again, I think it's just -- you know, again, I think, you know, we've

had, you know, being technology neutral is certainly of concern to us, especially in other governmental agencies, you know, as I mentioned about, you know, what's going on with the RUS and NTIA.

Also, one market, you know, a lot of the criteria is you can only serve in one market. Well, obviously, any type of national platform is going to cover the entire country. So -- and I think, you know, looking at us, where are we on our technology evolution path versus wirelined or wireless? Because I think second generation is a leap and third generation, again, we see is a substantial increase in capacity.

MR. DILLNER: And the capacity is just a throughput issue or -- what does it -- like what are the benefits that you use from one generation to the next, just (inaudible).

MR. CARROLL: It's primarily increases in the ground infrastructure technology, ability to push more bits in a more concise manner. And it's the ability of the satellite design,

increases in power. You know those satellites were designed 10+ years ago. You can now build a satellite that has twice as much power on it an still not push the edge.

And the way the beam patterns are designed, allow you to put more into (inaudible).

MR. CURTIS: More spectral efficiency?

MR. CARROLL: Exactly.

MR. CURTIS: Yes, okay.

MR. CARROLL: Exactly. So all those things, you know, take us, you know, I think into providing a robust broadband service to a lot of markets that today can't receive anything.

MR. CURTIS: Got it. Brett, I think I saw your hand.

MR. GLASS: Well, I was just going to comment that, you know, we deal with a lot of markets where there are also a lot of satellite customers. And the big impediments that the customers say that they feel to adopting a satellite are, A, the initial install costs, the non-recurring costs, is a big hurdle because that

equipment is much more expensive than ours. We can get on somebody's roof with terrestrial wires broadband, and we can do that for $150 soup to nuts, including the truck roll. Satellite, you can't quite do that. You're talking several hundred dollars for your equipment down the truck roll and that has to be recovered somehow from someone.

The other thing which some of the customers say is a big impediment is, again -- actually three -- constraints on the use of the bandwidth, which consists of latency, which, hopefully, is going away; asymmetry, some of the don't like the asymmetry if they happen to be pushing a lot of bandwidth upstream; and the fair use policies which, again, actually if you take a look, you know, it may actually already run afoul of some of these so-called network neutrality principles that, you know, that the FCC has adopted.

I hope that -- you know, I hope for the benefit of my colleagues who do satellite that,

you know, that the FCC will consider the fact that satellite is different.

MR. DILLNER: I think Kris has a question.

MS. MONTEITH: Sure. I have a couple of questions actually. One is --

MR. CARROLL: Actually could I -- is it possible to answer some of his points directly some of his points very quickly?

MR. DILLNER: Sure.

MR. CURTIS: By all means, I think.

MR. CARROLL: I'll be two seconds.

MR. CURTIS: Yes.

MR. CARROLL: One, I think if you -- you know, today Wildblue charges $99 up front for an install. So there -- while we do have a higher equipment cost, we subsidize that.

Second of all, there is latency. You know, we're probably in the 600 millisecond, 700 millisecond latency, which we found so far impacts interactive game users and that's it. Anything else, you know, 99 percent of the services that we

get over the Internet are really not impacted by that.

Fair access policy, I think -- I'm not sure, certainly I'm assuming Frank does this, but I think everybody has to do traffic management. Otherwise, you end up with a very small base of your customers, you know, capturing the entire network.

So those are the things that we do, you know. I think we do things the same as, in many respects, as your -- as the wireless guys do.

MR. SCHUENEMAN: No, we don't do traffic management. We don't.

MR. CARROLL: We don't either.

SPEAKER: Nor us.

SPEAKER: No does Verizon or AT&T or Cablevision.

MR. BURSTEIN: I think Kris wanted --

MS. MONTEITH: Just a couple of things that we heard this morning and I'll throw out a couple of questions and feel free to answer one or more.

One thing that we heard this morning was comments around the point of one size doesn't fit all. We need to look at individual or particular areas. We need to get more granular. How does that translate to a national broadband plan? And how do we define "access?"

Then we also heard the comment that if the Internet is a utility in a utility world, you only have one provider in areas that are unserved or underserved to agreement with that.

And then lastly, should the Commission allow the market to define the parameters of what's acceptable service levels, particularly in unserved or underserved areas. Or should the Commission be setting some standards?

Just open it up for comment.

MR. BURSTEIN: I could, but I'm talking too much.

MR. EVANS: I'd like to just respond to the service standards issue. We'd just as soon it stayed the way it is, thank you. We like the enormous disparity that it creates: Our business

versus others. So we wouldn't advocate changes in that.

MR. FORD: I totally agree with the guy who said you shouldn't subsidize two firms. That was a brilliant insight.

That was me, by the way, if you weren't paying attention.

As far as the --

MS. MONTEITH: So then how do we pick winners?

MR. FORD: Well, that's a very difficult --

MS. MONTEITH: How do we (inaudible)?

MR. FORD: Or you trying to avoid having to is one option. You know, can you design a system that doesn't require you to do that? I mean, you know, to some extent, it's not like you want to necessarily pick one or the other.

You don't want to say you can't have more than one. But, in some cases, you almost have to. You know, it's very complicated because you get the potential. Because there's no

question there's going to be some mandate that you have uniform prices. And when you create uniform prices in a market with potential subsidies, you're going to have charity picking entrants and all these things, you know, that happened because of some regulatory scheme that's been put into the market. If wouldn't happen if there weren't this regulatory scheme in the market.

On the issue of unserved and underserved, I think you should just eliminate the whole concept of underserved altogether at the FCC. Okay? You define what it is to have broadband and you have it or you don't. End of story. Okay?

There are great risks with underserved and you're actually undermining the entire concept of underserved when you define it that way.

The notion of underserved is -- relates to very idiosyncratic cases in markets where a community might need a piece of fiber to an industry park they want to build or some kind of thing like that. They go with the (inaudible)

carriers and they say we're not interested or what to charge more than they want to pay. And they go we'd like to build it ourselves. And then, of course, there's fights in the legislature and everything else about doing this sort of thing. But that's where the underserved concept comes from.

It's not -- if you define it, you gut it of its purpose. Okay. And there's just no reason to make an easier dichotomous case of you have it -- of you have it -- you have something or you don't and then to create this continuum. Well, now I have to create these division lines along this continuous scale of what is this and what is that.

And you get into arguments where you conflate the demand side and the supply side and all this stuff. You know, it's -- just keep it clean and simple. I mean, you don't have a lot of time.

MR. COOPER: I'm going to agree emphatically with George. What you need to do, in

my opinion, is you need to pick a basic level of service that constitutes basic connectivity. People can compete way above that whenever they want. If they want to get money, they have to meet that minimum standard.

MS. MONTEITH: So we set a floor.

MR. COOPER: Excuse me?

MS. MONTEITH: We set a floor.

MR. CARROLL: You set a floor. And basically universal service at the commissions have always done that. They've had a quality of service standards for telephone service. And some people pay for higher levels of service. CFA has always supported differentiation as opposed to discrimination.

So you pick a basic level of service; you ought to be technology neutral, which is the second question. So one you've done that, any technology, whether it's satellite or a wireless technology that meets that standard is eligible to compete for your Universal Service Funds or your grants. If they want to do a higher equality and

incur more costs, they don't get higher costs from you. They've got to get that from the public.

Ultimately, if there's only one provider there you do have to worry about market power. And there has to be some -- the marketplace won't protect consumers in those circumstances, so the FCC will have to have some residual consumer protection.

MR. CURTIS: (inaudible) the definition or the floor. So a couple of questions around this and, hopefully, in increasing the order of difficulty.

Question number one is there one definition of unserved or is there a consumer definition of unserved and a business definition of unserved?

I there's a business definition of unserved, do you need to look at all the different segments of businesses to determine if, you know, the flower shop in some rural area is -- they're passed, they're passed by enough consumer broadband, but, you know, to support their, you

know, web presence, they don't have enough to make the question, you know well served -- served. What do you think about that?

MR. GAILEY: I think you need to be careful when you're talking about setting a floor. People will meet the floor.

MR. CURTIS: Well, let's come back to the floor.

MR. GAILEY: And --

MR. CURTIS: The first question is, is there one floor or -- as you guys think about the customers and markets that you serve. Right? Are there multiple floors?

MR. EVANS: This is a terribly complex issue, in my opinion. One community that would like us to serve wants it. It is not either underserved or unserved. But T1 connectivity costs $700. Now you tell me whether that area is unserved or underserved.

I would suggest that it is not being adequately served for certain, but it -- but this is where a lot of the difficulty in establishing

definition comes in. But this is confusing.

MR. CARROLL: And the reason --

MR. COOPER: Traditionally, Universal Service treated business customers as discretionary customers, and, therefore, they were not targets of Universal Service, certainly not on the lifeline part. In the high-cost fund they may well have been indirect targets. Of course, if you funded the build out of the network and you funded a switch, that Switch was capable of a T1 capacity and a DS1, or a residential capacity.

But University Service has generally focused traditionally on the residential sector.

MR. CURTIS: Yes, understand that. The question is whether that's right.

MR. BURSTEIN: Two very quick empirical points. First, there are so few businesses that would quality in this that it's not terribly interesting to look at the business as underserved. Because you have lots of choices for a business and you're getting -- taking care -- if you have consumer broadband there, you're doing

what any small business wants.

Second to the lady's question on the end about quality of service and so on. It turns out that why it's really dramatic and somebody this morning took about 1-1/2 meg on a 10 megabit line. I did a whole chapter in DSL hell.

That's must rarer than people think, that the British just found that nearly always the 10 megabit cable line got 8 megabits. My 10 megabit (inaudible). So in theory it's possible and, in theory, (inaudible) even beyond satellite could be an issue?

It turns out almost all the service is pretty darn good and the difference between what it is and what it should be is very rarely interesting enough to bring policy into it until you've got some really abusive carriers, and then you can go to false advertising.

MR. GAILEY: I'm not going to agree with what he's saying on quality of service. My customers expect, when they turn the computer on, they have it, whether it's a snowstorm, a

lightning storm, whether they live in the national forest, wherever they live they don't want something impeding their service.

So while in the cell phone world we put up with are you there, are you there, and they call back four or five times. Customers are not going to put up with that in their broadband world, especially if they're getting entertainment on it or downloading files at 2 a.m. in the morning, whether they're business or residential customers. Because it's increasingly more difficult to differentiate between business customers and residential customers because this wonderful network of the Internet has allowed more and more folks to work from home. And that's exactly what we're looking at trying to promote here, is people having the ability to telecommute.

MR. BURSTEIN: He's right and I'm wrong. I didn't think of the cases where there's no service at all. I was talking about speed and other problems.

You are absolutely right, the bloody

thing should work. Because I can't earn my living if my Internet connection is down.

MR. DILLNER: And I think Brett wanted to add something and then I want to get to an online question.

MR. GLASS: Yes. Well, when I talk to my customers about what they consider to be unserved, they find -- they tell me that cost is an avoidable part of the equation if they can get, you know, if they can get 768K. But as I was saying before, if they had to pay 80-, $90 a month for it, they don't consider themselves even to be served. And therefore, what I suggest that you do, and this is, you know -- maybe -- this is I think really the practical definition you have to go with, when you consider whether someone is served, you need to consider not the number of megabits they can get because the provider -- we as providers don't have problem providing people with almost any number of megabits they want. But what is the cost per megabit and is it low enough? That, I think, should be your definition of

unserved versus served.

MR. CURTIS: That's -- actually before we go to the online question, that's -- I would love to quickly, you know, 15 seconds each, get a run around the room. You know, if you think about unserved, what's the right way to think about it? Another way to put it, what's the right way to think about whether you've got something versus having broadband?

MR. BURSTEIN: Best answer on that came from Dave Clark and a whole pile of people who did the bringing home the bits survey for the FCC around 2002. They pointed out that the technology is continually getting better and the minimum you should expect and what you should offer should move with where the technology is. And at this point, it's reasonable to give a megabit or two to about 98 percent of the U.S. So I'd put that as a minimum. In 2014, you're going to be able to give that speed, as Verizon was testifying, to 95 percent of the U.S., and I would run the minimum there.

Related to which, wired and wireless are different. Wireless and satellite does have some capacity constraints. They're often exaggerated in neutrality debates, but they're real and you have to think of them. Wireline, except for a small problem on upstream cable, can give the maximum speed of the line to every customer for a difference in cost that's less than $1 a month and usually closer to 10 cents.

MR. CURTIS: So laying this back, you know, I think the way you would think about broadband is it's the bit rate at which some extremely high, approaching 100 percent of the population, can get that bit rate at a reasonable price.

MR. BURSTEIN: Sounds good to me.

MR. CURTIS: Okay.

MR. CARROLL: Yes. So I would look at it differently. Again, I -- again, our focus has always been, you know, crossing the digital divide and delivering service to basically consumers that don't have it today, and that's the marketplace we

play in. So, you know, when I look at it, I listen to all the customers who had dial-up and say, oh, gee, you know, you guys have been a godsend. I used to have to go to work to operate off of my computer and now I can work from home three days a week.

So I would say it's -- you know, is it a better service? And I would say marginal -- or, you know, substantially better, not, you know, dial-up to, you know, 100 kilobits or something like that. And, you know, does -- you know, is the price point reasonable for an average consumer to be able to pay it on a monthly basis?

MR. COOPER: I would adopt your definition, but add one observation.

MR. CURTIS: Well, it's Dave's definition.

MR. COOPER: No, no. Well, you reprised it, okay? You reprised it.

MR. CURTIS: It doesn't matter who has it. It's whether it's right or wrong.

MR. COOPER: Okay. I would add

additional idea: That you define the bit rate, the minimum bit rate with respect to the basic functionality that people use, that most people use. Because obviously that -- to me that's where you get basic connectivity.

MR. CURTIS: How would you think about that?

MR. COOPER: The one to two, three today. Actually when you look at the things people do, that size system gets most of them done.

MR. CURTIS: But that will change over time.

MR. COOPER: That's my second point. You have to remember, the statute is a progressive statute. The first sentence I read to you, when it was written in 1934, two-thirds of the American people didn't have a telephone. So it's a very progressive statute.

The '96 Act actually made it more progressive in a variety of ways and specifically said -- it included information services, it gave

you a series of standards. So if we agree on 3 megabits today, we should not be embarrassed to be back here in 10 years saying, well, now we're up to 15 or 20. That's the nature of a progressive statute.

MR. CURTIS: So now, before we go to -- I'm getting tired. Nobody's talked about uplink. Nobody's talked about latency. Nobody's talked about jitter. I thin it's convenient people always -- when you talk about -- not always -- when you talk about broadband people always say some number of MIPs and it's almost always down. Maybe that's okay. I have a feeling it may not be.

So, you know, as we now go a few legs further on this, right, what do we think about uplink, latency, jitter?

Do they count? And if they do, how important are they and how should I think about how they evolve over time?

You had your chance.

MR. BURSTEIN: That's why I'm being very

quiet here.

SPEAKER: Let Gary go.

MR. EVANS: I think upload is a huge equation here and I think any standard that's adopted ought to be symmetrical.

MR. CURTIS: Symmetrical?

MR. EVANS: Yes.

MR. CURTIS: Say more.

MR. EVANS: Actually we see now more and more telecommuters as everybody here has referenced, and they're dependent on speeds that are greater than those than they can get now. I think that most of the architectures will, at the 1 to 2 megabit range, afford symmetry and we ought to make that part of the equation.

MR. CURTIS: Are you seeing in your traffic a rough symmetry in the actual uplink and downlink in your data or are you thinking that's going to be happen in some number of years?

MR. EVANS: No, we --

MR. CURTIS: You're actually seeing that.

MR. EVANS: Yes, we are seeing it.

MR. CURTIS: Wow, okay. Frank, are you --

MR. SCHUENEMAN: Yes, we don't see symmetry in our network at all. It's different by, you know, by a factor of five.

MR. CURTIS: By segment, by area, by --

MR. SCHUENEMAN: Yes. Well, no, I mean, when we look at our Internet drains and what's download and what's upload, it's real obvious. The vast majority of traffic's download and a portion of it, 20 percent perhaps, is upload.

I mean, that's just usage. That's usage patterns and I think that'll be -- that'll continue that way as Internet- based video streaming becomes more and more popular. It's going to only exacerbate that situation or make it better, however you want to look at it.

MR. CURTIS: George, how do you define broadband?

MR. FORD: Well, I'm reminded of a line from a movie. You know, I'd like a toilet made of

solid gold, but it's just not in the cards now, is it?

I think we have to be a little realistic, and this is in FCC. This isn't what some guy's going to -- he's not required to offer symmetric, but he does, okay? I mean, we're going to see a lot of that. We're asking the questions what is in the regulation to distribute something, okay?

It's probably the case that you can get a great deal of the benefits of the Internet with less than 1 megabit, okay? I mean, we've got cases where, you know, the guys from Connected Nation can give you cases where a 200 kilobit circuit, you know, took someone who couldn't work and allowed them to work. I mean, it's -- so you need to really focus I guess on the social value and not whether or not I can download videos from YouTube or -- you know, unless they're teaching you something, but most -- you know, a lot of the Internet is entertainment, and we don't need to be subsidizing entertainment. Okay? That's not a --

that's a consumption good. Okay. I know it's weird to say we shouldn't subsidize consumption in Washington these days, but you really shouldn't, okay? So we need to focus, I think. And symmetry may be fine.

What's it going to cost you to have that? I mean, is it going to cost you twice as much? And if it's going to cost you twice as much, does it give you twice as much?

MR. CURTIS: How do we answer that question?

MR. FORD: Well, that's what they got you here for.

MR. BURSTEIN: You answer that question empirically by looking at what's out there, what it costs, and so on, instead of the theoretical economics that don't apply when we only have a couple of providers. And that was why I wanted to come in on this.

MR. FORD: There's no economic fear of monopoly?

MR. BURSTEIN: What? I don't think

we're a monopoly. I think we're something like a duopoly and I'm not going to go there. I'm much more --

MR. CURTIS: Dave, I'm going to -- Dave? Dave? I'm going to finish going around and, if we've got time, we'll come back.

MR. BURSTEIN: Okay. But put in -- get in upstream DOCSIS 3.0.

MR. CURTIS: Okay. Mark?

MR. GAILEY: I've got a problem with setting a rate unless when you set that rate, you set something in statute that says you're going to revisit what that rate's going to be.

MR. CURTIS: So it's got to be -- it's got to evolve.

MR. GAILEY: It's got to be evolving. Because, you know, 256 was okay last year. That was basically the definition for broadband was 256. Now we've got some dockets that say 768. Tomorrow it may be 3 meg, it may be 10 meg, it may be 150 meg. I don't know, but it's got to be something that it's got to be revisited from time

to time.

MR. DILLNER: Should it be revisited or is there a trajectory that we can -- that we know about right now, a trend in the growth rate right now that would be informative of setting this? Is it more helpful to know now where the target's going to be in two years or is it more helpful to know that we're going to revisit the target in two years?

MR. GAILEY: I think you run a risk in a growth market that's growing drastically in doing a projection. My opinion is you should relook at it and then look back and see what it's doing. And if you look back and it's consistently growing 10, 15, 20, 150 percent, whatever it is, then maybe for the next 2 years you set that standard along with that, and then you see what happens a few years down the road.

But I have a difficult -- I have a real difficulty in telling you this is what it should be.

MR. CURTIS: Got it.

MR. GLASS: You're going to observe this in the served markets, right? We're talking about unserved markets.

You're going to observe this. So you can track what happens where there's no problem and keep -- you could, you know, theoretically imagine a scale between what happens in markets that we know would not be unserved versus markets that don't.

It's, you know, 20 percent of the typical bandwidth demands of some other markets, something like that you could do.

MR. CURTIS: Brett.

MR. GLASS: Yes, okay. I really think that the market has to define your standards. People have different needs. There are some people who need symmetrical service because of particular things they do, but 95 percent of our customers don't. Ninety-five percent of our customers are data consumers. They're streaming YouTube all the time.

Most of the people don't care about

jitter. They're doing things which are insensitive to jitter. A few of them are VOIP customers; they care a lot about it.

And so I think the problem is that if we set our standards too rigidly and, also, if we don't look at what the market is actually doing, we really run the risk of setting a standard that just doesn't apply to the real world. Again, I think that what we need to do is look -- you know, look at what the market is doing at the moment in areas which are served -- and this is the thing which I think George hits it right on the head -- and then say, okay, this person doesn't have the -- you know, doesn't have what people seem to be wanting or it doesn't have it, again, at a price that people are willing to pay.

And again, I really have to keep emphasizing we need to set standards for how much it costs per unit of bandwidth or we're not doing our job.

MR. CURTIS: Got it.

MR. DILLNER: Frank, did you have

anything to add?

MR. SCHUENEMAN: Yes, just -- and I would fall in the camp of I think we do need to bound it and we need to bound it with a price point and a speed. I mean, you've got to start somewhere. Ken's company fills a really valuable niche, you know, but it's -- if you don't bound it at all, we can say let's all go home, Ken's got the rest of us covered, let's go. And, you know, we're not -- that's not the conversation here.

So, to start whittling away at that, you've got to ask yourself, okay, what's a reasonable price for a more traditional connection? And what's a reasonable speed? And maybe perhaps some other performance standards.

On the whole issue of symmetry, the guys that designed hyper-fiber coax networks and the guys that designed ADSL networks did so because there was an observed usage pattern and you could maximize your investment by offering symmetry rather than having wasted upload capacity just waiting. That -- those usage patterns are still

very much in effect. And so to drive symmetry, you know, prematurely would just be a waste of capital dollars in my opinion.

MR. DILLNER: Okay. Well, I'm looking at the clock and we are out of time. This conversation could go on for days and days.

I want to thank our distinguished panelists for continuing the conversation. This dialogue's going to continue on as we continue to think about what it is we need to do about broadband in this country.

So thank you. And I thank your online audience and our in-person audience. And have a great day. Thanks.

(Whereupon, at 5:29 p.m., the PROCEEDINGS were adjourned.)

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I, Carleton J. Anderson, III do hereby certify that the forgoing electronic file when originally transmitted was reduced to text at my direction; that said transcript is a true record of the proceedings therein referenced; that I am neither counsel for, related to, nor employed by any of the parties to the action in which these proceedings were taken; and, furthermore, that I am neither a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

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