Technology Administration

UNDERSTANDING BROADBAND DEMAND:

Broadband & Business Productivity

Monday, March 25th, 2002

UNITED STATES OF AMERICA

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DEPARTMENT OF COMMERCE
TECHNOLOGY ADMINISTRATION
OFFICE OF TECHNOLOGY POLICY

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The workshop took place at 9:15 a.m. in Room 4830 of the United States Department of Commerce, 14th and Constitution Avenue, N.W., Washington, D.C. 20230, with Phillip J. Bond, moderator, presiding.

PRESENT:

PHILLIP J. BOND, Under Secretary for Technology
KATHLEEN COOPER, Under Secretary for Economic Affairs
BRUCE P. MEHLMAN, Assistant Secretary for Technology Policy
BRAD ALLENBY, AT&T
DYLAN BROOKS, Jupiter Media Metrix
CHRIS CAINE, IBM
RHETT DAWSON, ITIC
R. BRUCE JOSTEN, U.S. Chamber of Commerce
PROFESSOR BRIAN KAHIN, University of Maryland
WILLIAM KOFF, Computer Sciences Corporation
BOJANA (BJ) MAMUZIC, SBC Communications
HARRIS MILLER, ITAA
DR. WILLIAM MULARIE, Telework Consortium
STAGG NEWMAN, McKinsey & Co.
NICK PATTAKOS, Oracle
DAVID PEYTON, NAM
BRUCE PHILLIPS, NFIB
TOBY REDSHAW, Motorola
TONY RYBCZYNSKI, Nortel Networks
SKIP TAYLOR, Fiberlink
STEVE TOLBERT, Global Systems & Strategies
MIKE WEIR, Cisco Systems
GREG WOOD, Internet 2

C-O-N-T-E-N-T-S

P-R-O-C-E-E-D-I-N-G-S

9:17 a.m.

SECRETARY PHILLIP J. BOND: Good morning. Let's go ahead and get started. Thank you for finding your seats. Let me welcome you to the Commerce Department and to this forum on Broadband & Business Productivity.

My name is Phil Bond. I'm privileged to serve here as the Under Secretary for Technology in overseeing the Technology Administration Bureau that is hosting this along with our sister bureau here, the Economic and Statistics Administration headed by Under Secretary Kathleen Cooper. I would like to say just a few words by introduction and opening this morning, then recognize Under Secretary Cooper for a few opening thoughts and the same from Assistant Secretary Bruce Mehlman seated here to my right.

Here at the Technology Administration, or TA as we call it, we strive to maximize technology's contribution to U.S. economic growth, productivity and global competitiveness. We work closely with many of the technology leaders in town and across the country. We have had the pleasure of working with many of you here in this room before. We aspire to be the premier portal for the technology sector to the Federal Government,

convening innovators and entrepreneurs on critical issues on virtually a monthly basis. In fact over the past year we have been able to work with the sector on such topics as education reform, trade promotion, export control reform, depreciation of capital expenditures, R & D, tax policy, and many other issues. I think it is safe to say that no other issue has consumed as much time, energy, heat, light, ink and bandwidth as broadband.

Let me return to today's topic. First of all, we really are grateful to all of you who have come today to join us for this discussion. It's really quite an assemblage of expertise and we appreciate you joining us. We look forward to a discussion on the interplay between two of the great fundamentals of the American economy: technology and productivity.

Let me just say that technology really is recognized by the Bush Administration as central to all of its goals from winning the war on terrorism to securing the homeland to maintaining economic security. Technology will be simply vital to success in these areas. This morning we focus on economic security, on restoring growth and growing investment in our economy. That is exactly what broadband deployment could do for our economy. Maintaining American leadership in the information

age would bring secure, high value-added jobs that can provide for the needs of American families.

Any number of studies has confirmed that broadband deployment would bring millions of new jobs. But that is only part of the story. Truly widespread, always on, true broadband touches every facet of American life, would change education, change health care, change entertainment as we know it, allow truly mobile work, transforming our lives and our daily routines in positive ways.

We could here at TA and very well may have daylong discussions about how true broadband could change health care or education or allow grandparents to truly be in touch real-time with their grandkids. But today it is devoted to what it could mean for business, the productivity surge that could be realized if every business was truly an e-business fully prepared to ring every possible advantage out of sharing information through high speed, high capacity always-on networks.

While many of the world's top companies have taken major strides toward becoming a fully integrated e-business, many other indeed most have not. The IBMs, the Ciscos, the HPs, the Motorolas, many of the companies represented here have realized significant productivity enhancements by

taking their business almost completely 100 percent to the net. But most have not made the Internet completely central to their operations.

Cal Berkeley's Hal Varian has estimated that about 60 percent of U.S. businesses have introduced Internet business solutions but many of those are short of the kind of total integration that we are talking about - which WalMart epitomizes. We know from our friends over at NFIB that many smaller businesses by a frightening ratio of six to one simply don't see the Internet as a real source of greater business success.

So here at Technology Administration we've decided to do what we can to use the power to convene and bring you together for this half-day seminar. Of course we are not so presumptuous to think we know the answers but we felt we might be able to assemble some people who did. This morning we will discuss what an e-business is, what it can now and what it can do in the future. We will explore how broadband can drive strategic change and what speeds and bandwidths are necessary to achieve that kind of fundamental change. After listening about possibilities, we will learn about impediments, and what barriers remain to full deployment. When we are done, we hope to lay the groundwork for future collaboration in pursuit of

connectivity, so that all businesses will need to become e-Businesses capable of insuring that America maintains her lead in the information age.

One thing we know is that American business is more than capable of constantly improving productivity. Indeed through the recent downturn, American businesses have done just that, constantly improving productivity despite the weakness of the economy. Under Secretary Kathleen Cooper is far better qualified than I to address the productivity status of the American economy and the increasingly on-line nature of America's business. She serves as the principal economic advisor to Secretary Evans. She oversees some 7,000 employees who gather much of the economic and demographic data that is the lifeblood of business in America. Prior to her service at Commerce, Secretary Cooper was the chief economist for Exxon Mobile Corporation. Prior to that she served as Executive Vice President of Security Pacific Bank where she led the economics department of that major institution. We are thrilled to have some of her valuable time this morning to help us kick off the morning session. I introduce to you now Dr. Kathleen Cooper.

SECRETARY COOPER: Thank you very much, Phil. It is my pleasure to be here. I should say

just as Phil did that I feel privileged every day to serve as Under Secretary for the Economic and Statistics Administration with some absolute first-quality people doing the work that he described in terms of pulling together measurements on the U.S. economy.

Indeed our group, our part of the Commerce Department, has been very busy for a good while measuring and monitoring what is going on to the best that we can measure it on how business uses IT and how that changing relationship affects the U.S. economy. We recently published three reports and I believe those three reports are close to all of you. I looked around the room to see if it looked as if everyone has them. If not then we will certainly make sure that you do.

Let me just mention the highlights of each of those three reports that were released in the earlier part of this year. First I'll mention the Digital Economy 2002. We all know and as Phil mentioned this economy of ours has been through a tough period over the course of the last year or so. A slowing economy in 2001 very closely tied to weak capital spending and with that weak capital spending a large driver was what was going on in terms of IT spending. U.S. businesses invested in IT equipment and software at an annual rate of $400

billion in the third quarter of 2001 which was down even though a good solid number over 15 percent from the peak three quarters earlier.

In 2000, the composition of business IT spending shifted towards products and services likely to result in more productive use of IT hardware - that is, software computer services. This trend in our view is very important for us to continue to see it continue through the third quarter of last year and I think it's going to be important as we move forward and try to sort out what's going to happen to this economy and to investment in this sector.

The second report that is at your seat is called A Nation On-line. It was published in collaboration with another organization here in Commerce, NTIA, who are more on-going experts in this telecommunications area. What we learned and what you will see in terms of highlights in A Nation On-line is the rate of growth of Internet use in the U.S. is currently some two million new Internet users per month. More than half of the nation is now on-line. Ninety percent of children between the ages of five and seventeen now use computers. Computers at school substantially narrow the gap in computer usage rates for children from high and low-income families. Those are the

highlights. There is a lot more in that report if you want to take it with you and take a look at it.

The third report that is at your place is called Main Street in the Digital Age. It was our attempt to look at the difference between what small businesses and larger businesses are doing in terms of their investment in IT. What we learned is small and medium sized businesses both do invest approximately one-quarter of their total capital expenditures on computers and communications equipment, the same share as larger firms do. Over 70 percent of small and medium sized firms use computers in their businesses. Our best evidence from a combination of census and private sector data suggest that a majority of small businesses are also Internet subscribers.

I should say one however and that however is that the smaller the firm the less it invests in IT equipment on a per employee basis. That has much to do with the fact that the smaller the firm the less investment there is overall per employee. But we're going to change that as we move forward and certainly on the high tech side.

As Phil mentioned and I would want to emphasize, business investment and business investment in IT specifically are both very important to this recovery. Capital spending: a

turnaround there should be helped by the increased use of IT. We're seeing that stabilization as we speak over the last couple of months. We're encouraged by the fact that we do see stabilization and spending on IT equipment.

One plus of our current economy versus 10 years ago is the speed with which information flows to businesses. We feel very good about the fact that businesses after 9-11, seem to have much quicker reaction time, have the information much more quickly to make decisions they needed to make in a very tough environment. We think that what's going on with regard to their investment in IT is crucial to that. We believe that the investment in IT will help to boost the economy, boost production as the economy expands.

I look forward to today's session. I did nothing but to come today. I expect to learn from all of you today. The group that put this work together and is here to answer questions in the future for you is a very knowledgeable group and I noticed some of them in the back of the room. I'm sure they're here to learn from you just as I am. So I look forward to it and thank you, Phil and Bruce, for including me.

SECRETARY MEHLMAN: Thanks Phil. I just want to reiterate Phil's thanks to all of our

participants. I realize this is 9:00 a.m. on a Monday of a holiday week and it speaks a lot about your commitments and the importance of broadband that all of you were willing and able to take the time including some who undoubtedly had to fly last night to get here in time for the start. We are indeed grateful.

As Phil noted, broadband is the word on everyone's lips these days. It seems that not a week goes by without a conference or hearing on broadband. It has been identified as the number one or number two issue by just about every high tech trade association we hear from.

In our opinion, the sound and fury signifies something pretty significant. So we're trying to work to help, as the Vice President noted on February 21 in a speech out in San Jose. The Bush Administration is "committed to keeping America the world's leader in developing new broadband technology and applications." I'll offer a few notes and then turn it over the experts.

It should be noted to that end that The President just signed an acceleration of depreciation schedules for business investment in capital equipment to improve the business case for upgrading networks. We continue to encourage Congress to make the R&D tax credit permanent to

incent new investments in cutting-edge technologies such as broadband enabling technologies that I hope Stagg Newman from McKinsey might chat about when we get to our third issue.

We pushed to extend the Internet tax moratorium to support development and adoption of eCommerce applications. The President has made eGovernment a top management priority for the Administration. We're trying to lead by example here both in our own use of broadband eGovernment applications to leverage our resources and also in the content we're creating to better serve our constituents. I urge folks to take a look at what's happening at the U.S. Patent and Trademark Office, which is also here in the Department of Commerce. They are real eGovernment content leaders. Many biotech businesses that I've spoken to see the business case for acquiring high speed Internet enhanced by the fact that they can do so much so easily with the U.S. PTO.

We're working with IT and telecom industries to better protect critical infrastructures such as the high speed Internet. We're aggressively prosecuting Internet fraud and on-line crime to improve consumer confidence and make the value for businesses clearer. We're also pursuing international policies that support

Internet growth. That's why we extended the moratorium against customs duties on eCommerce at the WTO in Doha.

Our colleagues down the hall at NTIA have a great and challenging job and they're working with the experts at the FCC reviewing the existing regulatory and competition policies to insure maximum competition and certainty for investment. NTIA is also leading on efforts to manage the radio spectrum in ways that extend opportunities for new technologies to deliver broadband and to compete with the incumbents.

Thus while we in the Technology Administration see great promise in today's event and we're thrilled to have the folks we have, we wouldn't want our discussions to be misconstrued as the only thing the Administration is doing. Our focus and leadership is indeed on the demand side as one piece of an overall larger policy. We hope that today's exploration of broadband as a business accelerator can be followed by discussions around the nation as leaders and associations educate American businessmen and businesswomen about the possibilities of high speed networking to increase their own productivity and their own competitiveness.

One word on logistics. Debra there at

the end of the horseshoe is transcribing the discussions from today. We're going to post those discussions on our website. We request that folks upon leaving could get her a business card or make sure we spell your name right. Thanks.

SECRETARY BOND: Thank you Bruce. Let's go ahead and get started. You can see from the program you have here we have three main discussion areas that we want to touch on today. Starting first with broadband and eBusiness, let's turn to Toby Redshaw from Motorola. Go ahead.

MR. REDSHAW: Good morning. I'm the IT Strategy, Architecture and eBusiness guy from Motorola. I'm very pleased to be here. A lot of people in my company believe that we're at a pivot point. The adoption of broadband and everything that it can bring to us that we believe at a national level as was mentioned earlier is strategically important. We believe it's where the profit pools will come from in the future. Leadership in this area is absolutely critical.

As these [handouts] get around, I'll give you a quick overview of IT at Motorola to give you a panorama against which we are doing our broadband efforts. We're consolidating 174 computer centers down to eight. That sounds like a huge number but it's typical of companies our size.

We have 200,000 network devices, 120,000 email accounts, 100 million long distance minutes a year, 100 ARP instances, 300 large packaged apps., and a couple of billion dollars running through a single eBusiness system in transactions a year.

One thing that I think for the next generation of broadband computing is something I call -- the Conspiracy Factor. I think for the first time there are 10 or 12 different elements in technology (I'm on slide 5 already) are coming together that we believe will create serious acceleration in the utility of computing which has to be supported by broadband. You cannot do this with narrowband. If you look down that list, the maturation of persona management, intelligent agents, etc. I don't think we're going to have really intelligent agents in the next couple of quarters but you might have some very consistent almost intelligent agents. Telepresence. Seamless mobility, which we've already seen in action. Smart portability.

A little bit of irony on broadband, I think we're going to discover that not all data has to be there all the time which is an assumption of broadband. There is some very important value in asynchronous data, which I think will be going back to the future in a bursting vatch mode.

One of the things that I titled here was return on investment because we believe that this is going to be driven by simple business focus on getting more for your dollar. We think IP Centric Networks and broadband are shortly going to do that in two areas: virtualization of storage and virtualization of processing. Huge dollars are spent in IT in vertical departmental approaches to storage and computing and I believe pervasive broadband is required to resolve that. We think that is happening in the next 12 months.

Something that may surprise you at the enterprise level, which is supported by broadband is service-based architecture, fast components and output flexibility and I'll talk about that in a moment on slide 6. Those of you who have been in technology for a while will go yes I heard that when Smalltalk came out. But this time it's really happening. I think again that's maturation process.

The middleware, the boring pipes that shoot your data around, those are evolving. I'll describe what the eight-minute egg is on the next slide. I think that may surprise you.

Do more with less. Every business that I talked to is beating their IT people with a stick and saying look you have to do more with less. We

cannot continue to fund you in the way that we have been doing. You're going to have to get creative. All of this lives on top of a broadband platform. I think for the first time we're going to see percentage spends in eCommerce segments actually move beyond negligible amounts. We're seeing it in some of our infrastructure businesses where we believe in the next three or four years the majority of some of that business will be on-line which for a $40 billion company is pretty impressive.

Lastly, this spaghetti-looking chart, Service Based Architecture. The gray bar is your boring middleware services that haul the data around. Those vendors work with the next layer above which is the new service based architecture layer which takes out of your application spaghetti components and creates objects in that layer which you can then reuse within your business so that you don't have to do a demand planning or new product integration set of components over and over again. You can just reuse them. We've had the vendors working with each other to help us solve this problem.

In the current version of middleware, it takes eight minutes to create that object and reuse it around the corporation at that service

based architecture level. When we go to the latest version of the middleware it will take three clicks. So all of a sudden this long months and months of hard coding will turn into a matter of a little bit of analysis and a couple of days. Then we have the application done.

The important thing about service-based architecture is that top layer. I called it a dual layer because it asks two questions. What device does you want to output this to and what format? That requires broadband. Again that's a matter of a few clicks.

Once you have the assembly of these components and the business process changes using service based architecture and that output flexibility, IT has just becomes a business process management tool rather than this reactive hand-coding event. We're building this right now. This is leading edge stuff for us. We believe this is going to drive productivity and of course this has to live on top of a broadband system.

SECRETARY BOND: Thank you. Bill.

DR. MULARIE: I'm Bill Mularie. I've been three weeks CEO for this thing we call the Teleware Consortium. Before that I spent five years on a term assignment in Government lastly at the Central Intelligence Agency, three years with

Information Systems Office Director at DARPA and a few years as Deputy Director of --

Let me throw the bomb early so you understand where I'm from. I guess if I would summarize it, it's that I feel that these wonderful promises of this computer information and communications age are really being unfulfilled due to the inadequacy of our current communications infrastructure. At Telework we're involved in just one of these. I suggest to you that, for business to business, other than simple transactional things, the elements that are necessary in a B to B environment like trust cannot be derived from our current information infrastructures: telemedicine, interactive gaming as Bill Gates with the x-Box and what he predicated the design of that for example, distance learning, HDTV, video on demand.

I'll tell you what I think the killer app. is, Telework is important, but the killer app. is what it's always been through the ages and that's human-to-human communications. The vision I have is I want to read my grandsons in Northeastern Montana bedtime stories every night. Why can't I do that? It's because of our communications infrastructure.

A few words about Telework and then about the Telework Consortium. Let me describe

what I feel is the problem with even the definition of broadband. There are two critical rationales at least for engaging this important Telework Consortium. One is the obvious thing of congestion and cost of roadways. GWU is doing a study for us in terms of the subsidy that we as taxpayers pay each commuter in the northern Virginia area. It's coming out something like $2,000 to $3,000 a year. That's what we subsidize every car on the roadway just for this act of commuting so the cost associated with having to go to this thing that we call the "Place" as we are here today including really the sociological cost.

The second really is a post September 11th issue. In DARPA, I was responsible for the cyber security research for the Department of Defense. After September 11th we realized there are other security issues like personal security. The first principle of security and survivability is the distribution of value that we collect people, valuable assets in singular places. This is very insecure.

So first the personal security issue is can we operate in a geographically distributive mode. The second really is distributed corporations or agencies. I think the biggest example of this was the Cantor Fitzgerald

Corporation in the World Trade Center. As a government and corporate environment, can we operate in a distributed manner? The answer is not currently because again of the inadequacies of the infrastructure.

A few words about the Telework Consortium. We're incorporated as a 5013(c) under the Software Productivity Consortium under Mr. Werner Schaerer. We have been funded by a grant from the Department of Commerce here sponsored by Congressman Frank Wolf of Virginia to establish several telework demonstrations in northern Virginia linking some government agencies, northern Virginia businesses and teleworkers distributed through the northern Virginia area. In addition to the government grants funding, we have several technology partners on our board for example Nortel, AT&T and AOL and several others.

So the key difference between what we're driving in the Telework Consortium and others is that our consortium is predicated upon the belief that the current communications infrastructure does not support what we want to do for example in telework. So as part of these demonstration projects, we are really working and looking at level one and two. We're looking at high bandwidth symmetric pipes as a necessary to

really drive this telework to really show that productivity and the benefit of telework.

Lastly let me say a few words about broadband. What I did in preparation for this is look at a few dictionaries. I think if nothing else we should maybe understand and I don't think agree on what this thing broadband is. Some definitions are "when the bandwidth of a signal is large it can simultaneously carry many channels of information." Okay that's good.

Fiber optic cable in particular has a very high bandwidth and is referred to as broadband. So we have a cable that's broadband but the essence is that we have a medium that can carry a lot of signals in different bandwidth channels.

So how much bandwidth? This is interesting too. One of the definitions was "broadband means a bandwidth greater than a traditional telephone speech channel of four kilohertz." Then in parenthesis the author says "(Some argue that broadband the medium must support 20 kilohertz.)" Okay. Another definition is "greater than ISDN 144 kilobytes a second." I think the FCC says "256 kilobytes a second." IBM says, "6 megabytes a second is minimum." So whatever this thing is I think the essence is larger is probably better but we don't know what

that is.

I think a very important thing that we have to decide, as a community in the construct of a communications infrastructure is the issue of symmetry or asymmetry in a communications infrastructure. Telework requires some effort in communications. In other words, the assumption that underlies a communication infrastructure is that we are not just primal information hunter/gatherers. We communicate.

In other words, Nirvana is not faster downloads. It's the ability to communicate symmetrically. So I'm a source of communications as you are. A lot of the technologies we are looking at now and we're calling broadband are fundamentally asymmetric.

So in the telework communications that currently we have if we call this broadband of course then we are not differentiating so we try things like ultrabands. I don't know if that works. But we are looking at ten to 100 megabytes per second symmetric in these channels to every desktop to every person involved in these telework consortiums. So that's where we are. Thank you.

SECRETARY BOND: Thank you. I feel like Toby we might want to give you a chance to respond quickly to the doctor's point that a lot of

this is talk and maybe isn't going to happen because of impediments. Do you want to respond?

MR. REDSHAW: Yes. Basically if you look at the technology state of large things, big brand corporations in the United States, it's pretty generally an opportunistic environment to put it nicely. There is a huge upside in the internal speed of those companies and the elimination of waste in the conversion of manual processes to eBusiness that's worth billions and billions of dollars.

We may not get to 20 megabytes-a-second synchronous links like reading stories to my grandchildren in Montana right away. But for the record, I don't have any. But, there is that journey to what the doctor is talking about which is a very productive one. I think for the first time in many years there is an inflection point so that we can really leverage that. So I think we are on the way to where he's describing. There's a lot of profit, a lot of benefit for the nation in going through that first.

SECRETARY BOND: He defined his term for broadband ten to 100 I think or it came down to. For your service-based architecture, what kind of bandwidth are you talking about?

MR. REDSHAW: We're talking inside the

corporation we'll actually go to a full fiber system with the help from our friends from Nortel probably. I think 500 to 700 K, the kind of numbers that get you to a 2.5 G almost 3.0 G standard in the cell phone world, would do great things for us, which is much slower. At 700 K you can do streaming video.

SECRETARY BOND: Harris.

MR. MILLER: Phil, I wondered if Dr. Mularie could help us get down to some brass tacks in terms of actual telecommunicating in this country. I know Congressman Wolf has been one of the strongest advocates of government teleworking but the last numbers I saw was out of the 1.7 million Federal civilian employees it was somewhere around five percent in telework. Even that is somewhat deceptive because what they call teleworking in government still involves getting in your car in many cases and driving to a telework center not teleworking from home. So if those numbers comport with what you know and do we have any sense yet that the government is really committed to becoming a model of teleworking for its own employees?

DR. MULARIE: My answer to that would be, we're looking at the chicken and the egg here. If there was infrastructure to allow broadband

symmetric communications then there would be in fact applications riding on top of these communications infrastructures that would make telework very high fidelity meaningful interaction. It would really be a different animal. It's really hard to make judgments on telework or the success of telework based on the adequacies of the whole system and the applications riding on this system.

SECRETARY BOND: Go ahead. Right here.

MR. RYBCZYNSKI: I'm Tony Rybczynski from Nortel Networks. So I think two things are emerging here. One is that you certainly have, as you were saying the internal networks within enterprises. So there we're talking about the capacity being definitely fiberoptic base. Then the other side you mentioned is the outside world, which is largely going to be around the Internet. It's going to be a lot around how people communicate as you were saying.

So let me just comment on both of these environments. On the inside of the enterprise the question really is how do you do more for less? The reality is that people within enterprises have an extremely complex IT environment to deal with starting off with these networks that we created, where you have in-building networks which are very

fast and relatively simple as soon as you go into the wide area you end up with all sorts of technologies, all sorts of conversion points, all sorts of costs associated with that and definitely at a lower speed based on current carriers.

But if you think about networks inside the corporations the cost of the optical networks has decreased at 2 orders of magnitude in the last five years and it's going to continue. So the opportunity really is to make these wide area enterprise networks look more and more like campus networks. All that will be translated to very significant simplification of your environment. Basically your branch office might look just like a wiring closet in a building. This simplification can free up a lot of the money that you need to ultimately develop applications. That comment is simplification. The way I say it is using bandwidth to gain bandwidth, because everybody we talk to says they just don't have IT capacity or money to do the things they really need to do through applications, much more interfacing going the customers and so on. So that's one comment.

The second one is around applications. That is that teleworking is a very significant area. But what I think is more significant in the bigger picture is the fact that the business world

is moving much more away from brand marketing in general. I'm not sure for Coca-Cola but it's certainly true for a lot of companies. They are moving away from that towards what we call "relationship marketing" with the customer. That means that teleworking is an extension of the enterprise but when you look at the big picture, we're all talking about how to serve the customers that are important to you and serve them better. It is like the gold, bronze, silver type customer levels and how to do that. Then that opens up the teleworking thing to a much bigger area and that is how do you deliver the function of the information that is inside the corporation to all of those touch points to the customers. Those touch points could be say working in hotels, at home, on the road, the customers themselves and so on. So that is a couple of points on simplification in the corporation and the bigger picture outside in terms of getting to the customer.

SECRETARY BOND: Go ahead. Right here.

MR. PATTAKOS: Nick Pattakos from Oracle. I just wanted to build on what Tony said. What we learned as Oracle became an eBusiness was just that first was to simplify our IT infrastructure. That took a great deal of cost out of how we did business. But the next more

important part was how we related to our customers and how we leveraged that. So the amount of money that we saved on cleaning up our infrastructure if you will or simplifying our infrastructure was significantly less than what we expect to save and what we expect to gain at developing our customer relationships electronically.

SECRETARY BOND: Let me ask folks to comment on this. If I'm hearing properly, that to become a real eBusiness, it starts obviously internally accrediting bandwidth through more efficient use and then step two comes from relationship. Then maybe step three is taking it outside enabling your sales force or customers for outside access to that information. Is that an accurate summary?

MR. PATTAKOS: I'm not sure if there those steps are necessarily appropriate. What we found was first step one was in fact simplifying our IT, consolidating our data centers, leveraging as many standards as we could as we put that together. The next step was we focused on leveraging that infrastructure inside of our organization with our employees. There wasn't we gained a lot of efficiencies later and saved a lot of money but the real bang for the buck was in fact the next step which was going out to the customer

and leveraging the work with our sales force and with our support force more importantly. Those steps all came together but once again it built on this simplified, consolidated, integrated and standard infrastructure.

SECRETARY BOND: Down at the end of the table there.

MR. NEWMAN: Well personally from somebody who used to spend two and a half hours a day commuting from suburban D.C. to the Federal Commuter Commission and now halfway telecommuting from rural North Carolina I can relate to what Dr. Mularie said. I'd like to get perspective on the following question from both the speakers from corporations and Dr. Mularie. How critical is it to get small and medium enterprises and the teleworker on the fiber network or would it be sufficient to get everybody on DSL and cable modems?

MR. RYBCZYNSKI: That looks like a good question for Dr. Mularie.

DR. MULARIE: Okay. Being a physicist, photons are what you want right to the back pane of the computer ultimately. Again the teleworker isn't in an environment where the current communications infrastructure he already has in his desktop is predicated upon he or she as an

information gatherer. The worldwide web is wonderful but it's not the Internet. The purpose of the Internet back in the early days was to allow humans to communicate. So communication really isn't a one-way street.

I don't think that a DSL or cable modem or those things which are fundamentally asymmetric are going to carry us in to where we're going to see the benefit of these tele _____ fill in the blank that we were talking about. I think we have to find asymmetry. I think we have to look at a very high bandwidth but also very symmetric communications. One of the media, which carries this very nicely, is fiber optic.

Let me just share with you a little story -- the reason that I'm excited about this thing being possible. I took a trip to Minnesota and there was a company called Optical Solutions. They market what is called a passive optical network in which they bring fiber right to the household.

They were describing a farmer in Northwestern Minnesota who's at the end of this passive optical network. He has a couple hundred digital channels. They even sent in another fiber for a couple of analog channels. He has 10 to 100 megabytes per second symmetric up in northern

Minnesota. He's doing this for $80 to $120 per month.

So I'm saying here in the northern Virginia high tech corridor where I live I'm 100 feet from a central office of the RBOC and I can only get 56K dial up modem. I think something is wrong with this picture. I'm not making judgments on the worth of a farmer versus a techie in northern Virginia but there's something wrong. What I'm saying is the world we want to describe in telework is both possible technology-wise currently and also it looks like it makes economic sense so I'm frustrated that we can't move ahead and move to this.

SECRETARY BOND: Let me jump in and say in this age of convergence I should not be surprised that discussion point one has already begun to converge into issue two, strategic change. But because Brad Allenby of AT&T is under some particular time pressures I wanted to go ahead and recognize him for a couple of thoughts before he has to depart.

MR. ALLENBY: And they do tie in very nicely. I think there are a couple of points I want to make. Telework is not an end all and be all but I think it's an interesting case study and it's one that is accessible to most people who are

familiar with it.

There's a couple of fundamental points that telework makes. The first is that you do get results. We save $25 million a year in real estate costs with our internal telework program. We save $10 million with enhanced retention. That is not direct productivity but what that tells you is you're not only getting increased productivity, you're getting increased quality of life. I think this is extremely important. This is a very technical discussion but let's not forget that the consumers at the other end are associates. They are not techies for the most part. That's a very important part of this program.

The third is we get $65 million very conservative estimate in increased productivity; direct productivity increases from our internal telework program. We have about 25 percent managers teleworking at least twice a week.

That leads up to two sources. The first is that generally they give us half of what they save on their commutes and they take half. They're happier. We're happier. We get increased productivity. That traffic jam you see out there every morning is basically lost productivity on the hoof. It shouldn't happen.

But we also get increased productivity

on a per hour basis. That result needs to be replicated across firms. So we're very confident that it's robust although like any productivity judgment there are questions about exact numbers.

The major reasons why we don't have higher telework at AT&T, which we want because of its obviously economic benefits tend to focus around the lack of broadband. Now I use broadband differently. We've heard a couple of definitions of broadband all of which have been technical. What our people care about is functionally. They're not wondering about what their bandwidth is in a technical sense. What they are wondering about is the psychological bandwidth that they are receiving and that's a different kind of an animal.

They want to be able to handle large files in a convenient way. Network engineers for example want to be able to collaborate on files. They want rapid access to all corporate systems. They want to be able to interact with others in ways that are psychologically comfortable, everything from email to interactive video.

So what we see is that the biggest barrier to telework at AT&T is not cultural which is what people usually tend to fall back on. It's the lack of broadband in a psychological sense.

There is more going on and I want to

end with this. One of the things that you have to be careful of when we talk about these areas is we tend to get lost along the spectrums that we don't know are there. For example, for telework we think of it basically as occasional telework to virtual office, which is one scale. Then on another scale you have day-to-day operations and you have the knowledge economy. This is characterized almost entirely by a manufacturing paradigm mind set. It's pervasive in companies. It's pervasive in Federal government. It's pervasive in regulations. It's pervasive in technology. It's pervasive in individual psychologies.

Most people are already here. Right? I mean you take work home with you. You travel. Most people already telework. The informal telework that characterizes day-to-day operations is already here.

However what most people don't realize is that this is a profound change from the way we do business. Let me just give you a couple of examples. Go to your HR people and tell them that vacations are obsolete. See what their response is. It goes against everything that we have been taught, that they have been taught, the way business operates. It's obsolete. You don't need vacations. Vacations fix a complete breakdown of

barriers between work, play, and family. That needs to be managed. That's not trivial. But it gives you an indication of some of the dynamics that are going on.

The IT function in most companies becomes absolutely critical in a teleworking organization because what are you doing. The definition of the firm which it should be, in a knowledge economy, begins to shift from one that's facilities based to one that's network based to the point where you could define some firms like say Dell as being enhanced network systems. The firm is the network. If you don't know how to maintain your networks, if you have bad IT support, for example, you're dead meat.

Going even further from a national perspective, what happens to American competitiveness if you take the productivity increases we've gotten in one company with a telework program that's big primarily and formal and you roll that out across the economy as a whole, I suggest that it's a huge source of comparative advantage that we haven’t begun to take full advantage of in this country.

Moreover, if you are thinking in the longer term, one of the biggest barriers to productivity in this country in the future is going

to be for example the cost of pensions. What telework does is take populations that previously have been defined as outside the ends of the firm particularly seniors and bring them back into the productive role in the economy. So that the firm becomes not in employees versus non-employees with a few contractors in the middle but becomes a management of knowledge structure. Once you do that you can begin to bring in groups that heretofore have been defined as outside the economy.

(Tape stopped.) primarily practical and psychological reasons. In a manufacturing economy sure. The knowledge economy of course they don't have to be. So there are huge enhancements to productivity, which come from understanding this both in a short term, tactical point of view and in the long-term strategic point of view.

SECRETARY MEHLMAN: Brad, if I could ask a follow-up question before you leave. As AT&T is making this migration from a day-to-day, occasional, informal teleworking to a knowledge economy with virtual offices and since we are not going to have you here for our third issue, what are the barriers? What are the challenges? What's going to define your ability to get where you have a vision to go?

MR. ALLENBY: The barriers are primarily technological. There are a number of barriers and again I would put them on a spectrum as well. In the short term, I think it's primarily functional broadband, the functionality that can be provided which tends to be inhibited in turn by a technological gap. In the longer term, you come up against a whole set of barriers which arise because what you're really trying to do is transition from a manufacturing paradigm to a knowledge economy paradigm. Frankly none of us are ready for this.

Again go to your HR department and tell them that vacation is a myth and see how far you get. I've tried. You don't get very far.

SECRETARY MEHLMAN: You're improving the quality of life by saying vacations is a myth?

MR. ALLENBY: Yes. You do because what you eventually do is enable people to manage their own time. Now I will say this. One of the arguments that you get from managers not within AT&T so much anymore but from some customers is people are not going to be productive if you let them telework. That's garbage. What I have found in my organization that is entirely virtual at this point, is I have to help people not work too hard not try to get them to produce.

It would be a mistake to think that

this is a trivial move into the brave new world because it's not. But the barriers you find tend to be really interesting ones that you didn't expect which is true of any profound technology.

SECRETARY BOND: Reactions anybody? Before you leave, I have felt for sometime privately that there were no such things as vacations but now you made it very clear.

SECRETARY COOPER: Especially now.

SECRETARY BOND: Now you made it public and my wife is going to kill me.

MR. RYBCZYNSKI: Yes. So along the spirit of the discussion, obviously if a person wants to go on a vacation, then mobility extends how the work could be more traditionally done.

MR. RYBCZYNSKI: To the broader question, which I think is very intriguing. There are a few hundred mobile devices in this room of varying sorts. Right? It's getting a little bit cumbersome to manage those in terms of how do you connect them. I'm in this meeting and who can interrupt me in one mode or another. Should it only be my boss, my customer, my wife, whatever? It's not productive having multiple mobile mail systems, multiple mobile devices, multiple addressing and all the rest of it. The whole

notion is to get some control in terms of the connectivity you get. I would suggest that in fact the movement to 2.5 and 3.0 G wireless and the broadband connectivity that gives you along with the broadband to the more traditional telework environment allows you to get that functional broadband whereby the user/employee and the customer has some control over this involvement to use whatever device he wants, to get the richness of communication that he wants, at a particular time in a particular community.

MR. ALLENBY: Yes. I'll leave with this which maybe a little more optimistic than the no vacation scenario where you want to get is the recognition that if you have a guy sitting in a cafe in Paris and he gives you two hours that encapsulates the knowledge that helps power your company that person is more valuable to you than somebody who's sitting in an office for 60 hours. We're clearly not there yet.

Among other things we have enormous problems in measuring productivity in a service economy but that's where you want to get. Because in fact if you are a knowledge company, that's the person who is more valuable. I had a guy like that, a great guy. He's Dutch. Totally nuts. But whenever he got a hold of me mainly from Europe at

odd hours he gave me as much or more value than everyone of the more traditional employees that I have. That's where you want to get. We're not there yet by a long shot but that's where you want to get. Maybe your wife will like that better.

SECRETARY BOND: Yes. Good spin. Thank you.

MR. ALLENBY: I'm sorry I have to leave.

SECRETARY BOND: You bet. Well, we've heard about some of the exciting internal savings about becoming an eBusiness for some of the premier world corporations here. We've heard about a bigger mind shift that's been described here. I want to go back to our smaller businesses who by a six to one ratio at least according to one survey don't see a value proposition. What among the discussion here holds out anything to them? What do we hold out to the small business to entice them to become an eBusiness? Let's go here.

MR. WEIR: Mike Weir with Cisco Systems. I belong to the Internet Business Solutions Group in Cisco, which is a global advisory capability of Cisco. So even in a technology company, we spend all of our time working with businesses and business leaders on something pretty simple, which is: what's the

business mission? Typically it comes back as a pretty old answer, which is to develop deep, broad, loyal customer relationships, high-level customer satisfaction, and profitability.

Ultimately we look at the small and medium businesses in terms of what are their challenges today in the global economy, the ability to provide this connectiveness with customers wherever they may be or trading partners wherever they may deem necessary and to be able fulfill the promise of this customer request requirement. We tend to back into the technology answers to those questions. What that generally reveals is that frankly broadband is a huge requirement simply because as Dr. Mularie points out this issue of communication.

We do more than 90 percent of our business over the web and more than 85 percent of our customer service calls are handled over the web. Yet we have a huge global sales force. We have a very high touch model. What that translates into is we talk to other businesses and we have low value transactions and interactions. We churn not unlike an ATM machine.

Then we have high value interactions, which is: where do you want to take your business? What are your hurdles? What are your challenges?

What is it that you would change if you could change?

DR. MULARIE: How is that done, Mike? Is that face-to-face?

MR. WEIR: Typically it's face to face. So that separates the way productivity gets enhanced. So there are low value transactions on our side, which mean there are low value transactions on the customer side. Instead of having very expensive employees engaged in where is my order? Is it red? Is it blue? I ordered on Tuesday. Where is it going to be? That's a relatively low value transaction. Also in my --

SECRETARY COOPER: Probably low cost as well?

MR. WEIR: I'm sorry.

SECRETARY COOPER: It's probably low cost as well.

MR. WEIR: Depending on modality. If it's a person-to-person interaction, it's high cost. If it's a self-service model it's typically low cost on both sides. So the whole notion of being able to have self service models with employees and customers and trading partners, *et cetera*, we think holds a lot of promise for small and medium businesses to take advantage of these technology solutions that big companies have been

using for a while.

The thing that really gets them excited though is the ability to present themselves to customers regardless of geographical boundaries with voice, video, data capability and the ability to have an interactive set of communications. I think that as we ultimately get to the technology solutions it really is a definitional question in terms of whether it's eLearning which we think ought to be symmetrical because it's learner centered as opposed to asynchronous in terms of teacher/student and other kinds of applications.

Those are areas that we see driving efficiency out of their business operations in terms of connecting them interactively with their suppliers and helping them connect interactively with their customers' needs and requirements whether it's order fulfillment or inventory management or matching in terms of stocking and supplying. Those are real concrete applications that these companies can take advantage of. Ultimately we do see that it requires a pretty big pipe to drive those kinds of pieces of information.

DR. MULARIE: I think that this is a sense of hierarchy when one goes through in business and I spent 33 years in this. The web allows introduction, transactional things to

happen. Then if there is some mutual reason to further interact, in your email you say I'll give you a call. What that means is okay there's more information. I get to know who Mike Weir is a little bit more. Then if we're going to come to a point we're going to make commitments for the corporation I'll come and see you which means I sit next to you and I really understand who you are. So I trust Cisco Systems because I've established this trust relationship with Mike Weir. Subsequently I'm saying that broadband in interactive immersive video maybe can carry a -- to that last state that it incurred sorts of systems.

MR. WEIR: Absolutely. I agree.

SECRETARY BOND: Paul.

MR. NUNES: I'm Paul Nunes from Accenture. I would just have to concur with Mike and Tony in that one of the things that's most important is the interconnectivity to real people. However one of the things that we see a lot of is the managing of cost of customer service to the actual value of the customer. When we talk about small and medium sized organizations there really is no way they are going to achieve the productivity that they want and the scale that they want to be operating on unless they are able to increase their ability to serve customers without

adding people on to it.

So for all the new self-service technologies, there is a lot of evidence that they are actually preferred by customers because of the ability to customize and do what they want with the technologies. There's also a lot of data that's showing that order size has actually increased and that relationships actually deepened with self-service technologies. We see this as a really important way for small and medium organizations to really increase their productivity and really become world-class companies while still maintaining the number of employees.

SECRETARY BOND: Let's hear from NFIB. Bruce.

MR. PHILLIPS: My name is Bruce Phillips. I'm with the National Federation of Independent Business. I work on regulatory/technology issues. I spent over 20 years with the Small Business Administration prior to that, 10 years as research director.

I find sitting around the table and listening to all of this very interesting and educational. But the most relevant thing that I've heard so far that I think is applicable to small and medium sized firms was Toby's comment from Motorola originally about getting more for your

dollar. NFIB has a series of polls that are on the Internet at NFIB.com.

We conducted one last spring prior to 9/11 on the recent value of websites. We had three questions on that survey that asked about broadband. I'll just share with you if I may (it will take no more than one minute) the results of three questions. Does your business have access to high speed Internet service if you wish to use it? About 60 percent said yes. By the way, this is Dun and Bradstreet data. It's not just NFIB's members so it is nationally representative. Twenty-five percent, approximately, said no. Sixteen percent said unsure.

Do you believe access to high speed Internet service gives your business a significant competitive advantage, a minor advantage or no advantage? Eighteen percent said a significant advantage. Twenty-four percent said a minor advantage. Thirty-five percent no advantage.

Last, do you believe the lack of high speed Internet access creates a significant competitive disadvantage, minor, *et cetera*? Five percent said a significant competitive disadvantage. Thirteen percent said a minor. Forty-eight percent said no competitive disadvantage.

Now why is that? Let's think for a second. Ninety percent of companies in this country have less than 20 employees. But 98 percent have less than 500 employees. Perhaps 60 percent of small firms have websites. Maybe 40 percent do some version of eCommerce. When various ad hoc, anecdotal evidence is looked at, you will find that many small firms, believe it or not, that are suppliers to companies like Chrysler and GM are still faxing purchase orders and faxing things. Their software is not yet compatible with the software of a major corporation.

So we in this room are on the frontiers of technology and many of our members may be on the Internet and may have some eCommerce but those that are doing business-to-business applications (and they are a vast minority) are still in a very elementary stage. If they happen to have a high-speed cable modem they're clearly, as indicated, in the minority.

Now how do we get more small firms to get interested in broadband to show that they can get more for the buck? My own impression from looking at this a little bit over the past two years has been that more small firms have to get an understanding of why B to B commerce will help their bottom line.

We read a recent Commerce [Department] report that only 1.2 percent of retail transactions were over the Internet in the fourth quarter of 2001. Yes we all know that it will probably double and triple in the next couple of years. But again remember we are talking about firms often that are the little restaurant, the corner gas station, perhaps a small doctor's office, *et cetera*. They have to be convinced why they need broadband. They may well now have a 56K dial-up modem. Many of them do. But they think that's sufficient. They have to understand how their productivity is further increased and why they should in some cases get into exporting where broadband obviously has a lot more applicability to increase their bottom line.

SECRETARY BOND: That's exactly one of the reasons why we are here today so I'm going to take your question and throw it out to various folks here today who want to try to pose an answer. We'll start with Toby.

MR. REDSHAW: I think this multimedia business segment is going to become massively important, probably the most important segment as we move through this broadband acceleration phase. It's nice you can save money on real estate and avoid traffic and retain some of your top layer

folks by basically saying you can stay home more. That's nice. But just about what every industry has discovered that where the profit is, where the money is, is in the small to medium customer.

I worked at FedEx for 17 years. We were IBM's number two customer. They shipped a lot with us. I don't think we made very much profit from each other. It was "we are your number two customer and we're squeezing you for that last nickel. We're going to ship below cost for you because, well, you ship a lot. Wait a minute. I'll make it up on volume."

Where the money is, is with the small and medium customer. I think that coupled with four or five other conspiring factors are going to make your area the hot area. Cost of sales both ways are going down. This technology may not do some fantastic telepresence, telecommuting thing but it will lower the cost of sales so I can now start selling to you. It's very expensive for large corporations to come and knock on a small to medium business's door because I have all this infrastructure.

The inverse of that is you don't have the small to medium business with all that infrastructure so they can adopt new technologies faster. Just given their size they are that agile.

Go to a company of 50 people and ask to meet the HR Department and see their big thick policy manual. It's not going to happen.

The other thing that's going to happen with broadband, and I think this will be a surprising thing, is that small to medium businesses will be able to aggregate and federate very quickly. That will create a negotiating, selling and buying power that's going to scare the larger corporations.

This may sound unbelievable but if I went to you three or four years ago and said "I have this tiny little application. I have about 10,000 users and in the next two years I'm going to have 40 million users of this thing on-line doing commercial transactions." You would say "right. Absolutely." And by the way, it's going to be run by 21-year-old kids. You'd say no way that is going to happen. That's peer-to-peer computing. Unfortunately it had to do with stealing music from the Internet. That's not a good economic model but that sort of growth or that sort of hockey stick looked like small and medium businesses where the profit is. It is going to change the dynamics of the economy.

SECRETARY BOND: Let me bring Chris in this because I remember an IBM presentation where

he said small is big and big is small. So explain that to us.

MR. CAINE: Well just for the record, FedEx was very good in squeezing us also. Put that on the record please. I wanted to commend you, Phil and Bruce and Kathleen, for this morning's program specifically around the intersection of the two concepts which I have not seen discussed in Washington before which is broadbanding and productivity especially on the demand side. This has been too focused on the supply side in my opinion. So when you start creating a framework around “is there a productivity enhancement that strategy benefiting the country that is coupled by the concepts of broadband and business activity on the business to business side,” it's a very fresh approach to the debate. I commend you for it.

I do think the comments about small business are important because I think that one of the things that we have found in our customer engagements relative to what it means to become an eBusiness is about processes. The small business has to think about what's going to help them generate more revenue.

Ninety percent of our businesses have less than 25 employees. There is no HR department. So why go to them and try and sell an HR or

compensation application on-line? They're just not going to need it. But what they are going to need is to know how to be more tightly coupled with Motorola or IBM or Oracle or whomever their supply chain relationships happen to be.

If that relationship can create more revenue but create more reliable revenue with less expense is a value proposition for the small business. That doesn't necessarily mean they need broadband to do it. But it does mean as they grow what will hold them back? I note some of your questions in the program go to this point, which is as a small business grows. They are more connected and becoming more of an eBusiness in real time, they are going to have to figure out how to grow their internal processes, determine which of those processes are more important, which ones need to be automated, which ones will require broadband capabilities to do so.

That's not going to be all processes at the beginning. They are going to have to make choices just like we had to make choices as a business that had to re-engineer itself, such as, how many critical integrated processes did we have; how many databases and sources of information did we have that could not talk to each other, could not share information.

I think Toby had a spaghetti chart as he called it. It's quite instructive because at the bottom, basically, there is all kinds of reservoirs of information that, whether you're in the public sector or in the private sector, in today's world by in large don't talk to each other. This gray line that he calls middleware is really what's allowing enterprises to integrate within themselves. As those enterprises are able to integrate with themselves, they realize that the next step of survival is being able integrate with those people outside their enterprise that they do business with everyday.

That's where the productivity value is going to come from. It's going to come from the capacity to integrate your information and to position it for action whether it is customer relationship management, whether it is supply chain management, or whether it is human resource type data.

I guess the point I would just leave with at this stage of the discussion is unless you have automated processes that are integrated within your enterprise and outside your enterprise the productivity gains are not going to come. Broadband by itself will not necessarily increase productivity. It is the capacity to do more in an

integrated way and to constantly draw on innovative technologies that it's going to join these two subjects that you have focused this morning's discussion around.

SECRETARY BOND: Thank you.

SECRETARY COOPER: I just wanted to say a word or two. You have had your hand up so you're next. I wanted to indicate for a second what you said in terms of productivity and all that's going on here. Also I want to indicate that words that I heard early on from Toby and from Tony at Nortel. Maybe it was you too.

The word “simplification” is the key word here I think. I think it's what some of you have been talking about from somebody who does not consider herself a technology expert by a long shot. What we've seen over the course of the 1990s is that as the software and all the various connections have gotten simpler and a lot more people can use it than ever was the case before we've seen the gains in productivity. That's for both within enterprises and between enterprises.

In addition, outside those enterprises in the eRetail business, which was brought up as well, it's still a very small part of the total. But until things get simpler and simpler and people get evermore used to using these technologies, it's

just not going to get broad enough. That word simplification I think just has to be repeated over and over again and common interface.

I keep remembering in the early '90s, here I am an economist talking, but you will recall that everyone in this country has worried about how in the world we would ever have strong productivity. How in the world would our, what we thought was a very poor, educational system be able to put to work and put to work productively a lot of the new workers that were coming into our system and into the labor force?

Yet what happened? In the second half of the 1990s we had the highest productivity growth that we've had since the 1960s. A lot of that was because of, in your field, systems were set up that were simplified that were put through and a lot of people were able to access and use that we just never dreamed could be there even in the retail part of our business at cash registers and so forth, remember all those hamburger flippers we were talking about back in the early part of the decade.

All I'm saying is the more we can tie this all together and the more simple we can make it so that all of us, even people like myself, can use this and will use this and can access evermore

information, the more this strong productivity growth is going to stay with us.

SECRETARY BOND: Right here.

MS. MAMUZIC: Good morning. BJ Mamuzic from SBC Communications. I wanted to share with the group here two findings that we had. We had conducted a survey with 500 small businesses in terms of what kind of impact broadband had on their business and to share with you two things. Then I'd like to make a couple of comments on the overall of the small business investors surveys three out of four said that high speed broadband had an increased productivity to them.

How did they measure it? Bottom line -- fifty-eight percent had said that they already had seen positive return on investments. If you think about it, what business today, if you look at the lowest common denominator, cannot benefit from having ten PCs all networked together? That's as fundamental as it gets, let alone some of the higher-speed applications, symmetric applications, and so forth. Look for the lowest common denominator and I think the market will drive itself.

Also I want to remind everybody here 10 years ago a lot of people were also saying why in the world would I ever need caller ID. Our own

internal study showed that the caller ID would never penetrate more than 20 percent of the population. We now have on average in our territory more than 50 percent and we actually have some areas that exceed 70 percent. So again people are saying why in the world would I need it. But I think the numbers speak for themselves.

But here I think that the market will grow. I think people need to be introduced in terms of what's the most fundamental benefit that they receive and then the market will drive itself. I think we have a key learning from the wireless market. If there was one truth with the wireless market it was that forecasts were always understated. So the market always exceeded any kind of prediction that was made.

To me, if I'm looking at small and medium businesses to get a prefundamental -- that regardless of what product or what service it is and that is easy to choose in terms of having a number of different providers, different applications on the market, easy to use, again the whole simplification piece of it we spoke about as well as easy to move up to higher functionality. Start with the 10 PCs networked in your office and then move up to teleworking, move up to videoconference and so on. The market will follow.

SECRETARY BOND: Down at the end there and then we're going to try to pivot to our next speaker.

MR. BROOKS: Dylan Brooks from Jupiter Media Metrix. I wanted to speak a little bit to a point that Bruce was making in terms of some of the data that is sitting there. It really applies to broadband as a whole that there is a lack of appreciation of what broadband is being used for among those that don't have it. So small businesses that say they are not at a competitive disadvantage because they don't have it largely don't know that. Consumers who are out there, that are saying I don't need broadband for streaming video and that's its major difference, aren't necessarily talking to their neighbors who said, “I thought I was going to streaming video and I never do and what I actually do is do a lot more research for work. I use directory services. I use movie listings. I get my kid on-line and he does his homework there.” A lot of the applications of what is fundamentally seen as a luxury, ancillary entertainment ends up having a lot more to do with productivity.

That said what is necessary in terms of broadband infrastructure to get that benefit is a very low benchmark. It has a lot more to do with

persistent connectivity than has to do with 100-megabyte speed.

When we look at the increase in the teleworker population right now in 2001 we had about 43.2 million teleworkers. The vast majority of those, about 33 million, were on dial-up. That was also the largest growing portion largely driven by corporations out there deploying VPN software and most of that ends up being dial-up.

It's nice when it's broadband and it does get some more usage but what we're looking at, and if we want to be realistic looking at the next several years, is an evolution of bandwidth speeds. If there's a revolutionary element it's mostly about a persistent connection. But even that again ends up really being a revolution especially for the third of U.S. households that have second phone lines just for Internet access.

If we look at “do we need some killer apps. to drive this?” No. This isn't a fundamentally new thing. Is there a benefit to all as a continuing investment? Is there a demand there? Absolutely. Fundamentally I'm probably shooting myself in the foot because I live in rural Colorado. I'll probably get some broadband access. Does something radical need to happen? Is the U.S. broadband broken? Absolutely not.

SECRETARY BOND: Thank you. I gather what you're saying is the first step is a mental shift to understanding the value of just connectivity. That's the first step to them seeing the value and implications so that you can emerge as a real eBusiness. With that brilliantly stated segway, let me turn to Paul from Accenture to talk to us a little bit about that.

MR. NUNES: My name is Paul Nunes. I'm from Accenture. I'm now what's being termed a lifer because I'm sixteen years with the same company. I'm quite unusual in today's market place. I work in our Institute for Strategic Change, a think tank in the Cambridge area. I've also spent a good deal of time in our technology assessment group in what was our Center for Strategic Technology Research. On behalf of Accenture and myself, I'd like to thank Mr. Bond and everybody else here for the opportunity to speak.

While there's broad agreement that when well implemented and for the right reasons, broadband brings significant benefits to those companies that pursue it. This is not just true for large organizations but we've heard that small organizations are finding value as well.

Today's companies are hesitating to

make broadband a key component in their business strategies. What do companies need to successfully adopt broadbands and become eBusinesses? At the core they need infrastructure. They need facilities and worker environments that support broadband usage. They need ubiquitous connectivity in the capacity that makes it a part of the fabric of business.

While many of them in server environments and newer facilities are better situated in this regard, many organizations still face significant challenges in outfitting their environment to support broadband usage. Additional infrastructure requirements include routers, servers, modems and leased lines for example but hidden costs are critically important as well. These include increased storage capacity to handle the new volumes of data that broadband demands. These costs include upgrading the personal computing devices that workers use to view and respond to broadband enabled applications. These costs include significant investment in the training required to bring users on board with new processes and new ways of doing business.

For every company these requirements are different. The level of broadband infrastructure needed to support their businesses

depends on three core factors: the size, the volume and the timeliness of the data it transacts. All of which have seen tremendous growth.

Today companies must make difficult choices as they tune their level of broadband capability to the level of demand of their current and proposed applications placed on these three factors and to the level of investment they are capable of or willing to make to support these applications. Many companies are managing these growing demands on their infrastructure through service providers, network, Internet and application which have greatly reduced the costs and the management challenges in wrapping up broadband capabilities. We see these providers and service bundlers as critical to helping companies make the transition to a new level of business applications that they drastically reduce costs and increase investment flexibility for companies.

But they alone are not sufficient. We see three significant requirements that go beyond specific technology investments that companies need to make and which successful companies have made to become eBusinesses.

The first is vision. Business leaders must be able to imagine the potential of broadband and to understand the unique opportunities it

presents to their individual organization. This has been difficult for a number of reasons. First the number and range of opportunities is so large that managers find it difficult to assess the value to prioritize them in the importance to their company.

Equally challenging is determining the overlapping in the synergies of broadband investment across applications and infrastructures especially across business units. Related to this is the absence of killer apps. that would make the decision to invest an easy one allowing the return on investment to be based on a single application.

Business leaders are also concerned about the difficulty in gaining unique competitive advantages from technologies that are considered external to their core businesses. Broadband can often be seen as more of a competitive necessity than as a tool for advantage.

One of the things that I was mentioning early to Will Mularie is that if I had a nickel for every time I've gone into a client who said, “what are my competitors doing. Show me the three other people who are doing this and then I can move.” Being the first mover is very challenging.

Successful moves are making broadband

solutions unique to their organizations and strategies. One company, for example, EMI Music Publishing, who nearly back in 1995 decided to digitize its over 135,000 music titles which now has enabled the business model to less than two manage that content from creation to marketing and distribution.

The second requirement in truly becoming an eBusiness is the ability to effectively manage the costs of broadband adoption. Many companies still face having to make risky bets on technologies and standards. Many of these bets are long term and inflexible.

Successful companies are attentive to the risks. One company we've worked with elected to postpone the broadband network solution because the broadband cost was estimated at $50 million over five years and there was no easy effective way to insure that costs would not significantly increase. As importantly that it would not decrease significantly for its competitors in that time frame. In addition, the related infrastructure investment was estimated at $25 million, half the cost of the bandwidth and not easily recoverable if the cost of the technologies changed in the coming five to seven years.

Successful companies are also actively

managing the ROI investment that we talked about. The ROI broadband investment is still too unclear to most businesses. Installing the technology remains the tip of the iceberg. To implement a system of distributing digital content requires far more than an idea in the pipe. There are costs for storage devices, the library, the content, routers and servers to distribute it to users, software to manage the documents and the content, software to manage the digital rates issues and a host of services and applications to insure security and effective network management.

On top of that redundancy must be built in to insure reliability for making critical applications. People and process costs also adds significantly to the costs. So the costs are much higher than a lot of what the discussion today is simply about the cost of bandwidth from the pipe standpoint.

But why broadband is more obvious to new business is they are built on its capabilities. It is much more difficult for established small and medium businesses who dramatically risk their current profitability to become comfortable with broadband based applications that would have a clear return on investment.

Another change to managing the costs is

that many of the supporting services are not readily available in mature businesses. Network and content management services and billing services for transactions conducted over broadband, for example, are not yet broadly and easily available particularly to smaller organizations. Many services are still not reliable enough for business use. While it has made significant progress, the web is still not industrial strength as the Wall Street Journal pointed out last Friday in its article about AOL.

The third and final requirement for business success is an understanding of the customer. The business managers need confidence in their customers' future broadband situation if they are to make decisions regarding broadband that they face today. Uncertainty about what capabilities that customers will have and a time table by which they will have them continues to hamper executive decision making on the development of new applications and new businesses.

Whether consumer-focused or business-to-business, successful companies know the capabilities of their customers. eTrade is one example of a company that was able to understand their customers' capabilities. pseudo.com a web-based distributor of streaming video did not

understand its customers' capabilities.

But on the consumer side great uncertainty remains. According to the Consumer Electronics Association while 68 percent of U.S. homes have access only nine to 10 percent subscribe. Uncertainty about what consumers will desire for broadband connectivity also remains a challenge as video on demand demonstrates in its continued struggles. Uncertainty about consumers' willingness to pay for broadband enabled products and services also hampers efforts. To highlight this I would mention the results of our most recent survey in which the majority of consumers respond that they are strongly dissatisfied with the cost of their cable, satellite and Internet services. While they are looking forward to new consumer electronics in the next few years that they expect to want, they also are strongly expecting prices to come down significantly, menacing hopes for broader success and profitability in these industries. Until the consumer is adequately brought into the solution, real needs for e-business success will not be met.

SECRETARY BOND: Response or questions anyone?

DR. MULARIE: Yes. Phil, I need to respond to that. There are only two questions in

this forum. One is how much bandwidth do you need to support current processes? And can we afford to support current processes? Telework or whatever. What we are asking in our consortium is a different thing. What will telework look like in a high bandwidth communications environment? That's a fundamentally different question.

Current systems and infrastructure are really as we heard earlier about information centering. Telework is a communications centering effort and so it's two different worlds. I tend not to think that an evolutionary view of this whole communications/broadband infrastructure is really going help us in terms of our global competitiveness. But the conundrum that we have is that there is going to be no investment in our infrastructure unless we can show new services or new benefit. There will be no benefit shown unless we have the infrastructure so we're really playing chicken and egg.

What we're doing in the Telework Consortium is saying, “okay we're going to provide the high bandwidth symmetric communications and we're going to see what we can build on this in terms of productivity and telework.” There are two schools of thought here in this forum. I suggest that this country is great because we fundamentally

have said, “okay let's do it. Let's see what we can build on top of this.”

I suspect that we're not going to gain much productivity in any of the business environments if we fundamentally take the backward view that let's look at current processes and what do we need to support that. I think this is a different animal. It's too fundamental I think to look at it that way.

SECRETARY BOND: David.

MR. PEYTON: I'm David Peyton with NAM. Paul, I agree with almost everything you were saying.

MR. NUNES: The deadly almost.

MR. PEYTON: No. Essentially everything. Let me explain a couple of things I came up with digging around the last couple of weeks. I asked one of our board member companies which is in the electronics business to do a case study on itself. They listed a wide menu of potential broadband based applications including Enterprise Resource Planning integration, -- life cycle management, e-Procurement, financial reporting, customer relationship management, remote analysis, remote diagnosis, video/web conferencing, business learning, strategic sourcing, on-line marketing, on-line ordering, service-provider

partnership and remote communications with field personnel.

So it's really a question of where do they start. All these things have multiple metrics for success for each of these applications. eProcurement turned out to have the greatest number of possible metrics, which were six: reduced inventories, just in time deliveries, business costs of goods sold, accrued supplier relationships, accrued margins, and market improvements.

Overall they have set goals for the coming year for the eBusiness program. They are hoping for two percent revenue growth, three percent direct cost savings, one percent overhead cost savings and ten to twenty percent cycle time in inventory turns improvement. That's the area where they are hoping to find the biggest measurable improvement is the cycle time in inventory turns.

That case study agrees with the limited data that I've been able to collect in my factory broadband connectivity survey that I have up linked from the NAM website. Unfortunately I don't have quite a few answers now but the clearest answer I'm getting is the importance of inventory and supply chain management. I asked companies what

application or applications drive your highest need for connectivity today and the clear, and far and away the number one, answer was inventory JIT and supply chain management. People generally are running speeds today, which are pretty evenly split, from dial-up all the way up to T1.

Then I asked people, using the same categories, what do they anticipate will be driving their highest need for productivity two years from now. It was the same category, inventory and supply chain. That was still the number one answer and they anticipate running data speeds pretty evenly split from 500 kilobytes to one megabyte. Some said one to 100 megabytes. Some said even over 100 megabytes.

So I think that you've said it, Paul. There's this huge array of options before companies. They are all multi-faceted and how do they know where to start? It's very hard to know where to start right now.

SECRETARY BOND: Go ahead.

MR. KOFF: I'm Bill Koff. I'm Chief Technologist for Computer Sciences Corporation. I think we are at the beginning of a application architecture revolution. I believe small- and medium-sized businesses and consumers are disadvantaged in that revolution and disadvantaged

because of broadband issues.

Take a look at some of the fundamental trends in technology today trends like the continued acceleration of our ability to scale silicon. Every 18 months we continue to have that exponential growth. We have the same thing in storage every 12 to 14 months doubling our capacity. According to Phil every 10 to 12 months we are doubling capacity in communications technologies.

If you look at silicon and storage, consumers, small business and medium business can take advantage of that because of the marketplace. They can take advantage of that by buying things in the marketplace. They can't take that same advantage in the communications marketplace.

I was happy to see the example from Motorola because I think that's an indication of what some of these new applications can be: service based architecture, web services, and business process management. These are things the small- and medium-sized businesses should be able to leverage, but more importantly, they should be able to participate in that market and be able to buy in the same way that we can buy things that are based on silicon or storage -- buying in the marketplace and being able to take advantage of

that continued acceleration and new growth. I think they are inhibited on doing that today.

SECRETARY BOND: Assuming they have the vision for it.

MR. NUNES: Well, I think that there are two things. The one is uncertainty about the price of these capabilities that makes companies hesitate, because if I can jump in tomorrow, it's going to be half the price next year. Maybe I'll just do it next year. So that's a significant instability. I think coupled with that is the stability of what does my customer base and employee base have, because if I build this large application, in three years will all of my employees have their own at-home high speed bandwidth? This inability to see what the situation is going to be, and control the cost for the ROI, is what makes companies hesitate.

SECRETARY BOND: Mike.

MR. WEIR: Yes. I just wanted to make a point about the whole notion of the plethora of opportunities and helping businesses really understand how to build a portfolio. Typically it's not one killer kind of an application that they can deploy today and is relatively easy to do based on the way their assets are aligned. So there has to be a portfolio.

The other thing about the surveys is it depends on whom you talk to. So if you talk to the chief financial officer you get one view of their world. If you talk to the chief technology officer you get another view of the world. Then the CIO and then sales and marketing. So it comes back to how do you drop down on a portfolio and try to understand the things that are going to make the biggest impact on the organization.

Whether it's web based services or simply outsourcing or out-tasking which is probably the first step along the path, the ability to have complete visibility into the outsourcer or out-taskers, processes and deliverables to maintain a high level of quality relative to your responsibility for the end customer requires a significant amount in our view of bandwidth to access those systems in real time. So that as you are out-tasking the actual function, the ability to maintain strategic intent and the requirement for delivery of high quality services to the end customer is maintained. To have that kind of quality assurance requires this accessibility and visibility and connectivity.

When we look back to the point of what's the business mission, whether it's outsourced or out-tasked or whether the web

services, whoever owns the customer branded relationship is going to have to have access into these other systems whether they sit physically inside the walls or outsourced or out-tasked someplace else.

My final point is that, I see it's in the third piece but I may not get back then, this huge cultural hurdle that we have. In one outfit someone said that they put a bomb on the table earlier and so here's another one. Whose asset is it anyway? If my company says it makes an awful lot of sense to pay for high speed access whether it's DSL or cable or some other type of validated mode for high speed broadband access because the business is dramatically enhanced by my connectivity, the business has to sign up for that. There may not be a one-to-one relationship in terms of what's the immediate ROI doing that.

So whose asset is it anyway? That's a huge cultural hurdle I think in terms of what are those employees doing with that lap top I gave and that high speed broadband connection that I gave them because they're not working for me 24 hours a day. Where we currently have an environment where people don't really want workers to drift over to PGA.com site for a minute or two to see how Tiger Woods is doing during the course of the day --

MR. REDSHAW: PGA has a site?

DR. MULARIE: There goes Motorola's eBusiness now.

MR. WEIR: Toby, I read about it in USA Today on the way over here today. So this is a key notion particularly if we draw back to small and medium businesses in terms of making that investment, in terms of believing that employees will be doing work for the better good and having them always on cable ready says they can perform work as it arrives and it meets their scheduled participation. But the reality is that if you want to change the cultural landscape, what people do at home will enhance how they think about and how they work for you as a business.

SECRETARY MEHLMAN: If I can jump in for a second. Greg you've been holding your hand up so I actually want to ask you a question. With respect to the Internet 2, which you represent, they built it. You often hear, echoing Field of Dreams, that if we just built a truly high-speed infrastructure, customers and applications would come. Well they built it and the question is, have they come. I am curious about what the Internet2 case is, the infrastructure for a lot of the universities is there. For the universities, productivity may not be defined in dollars, but it

is collaboration and service delivery. It is enhanced research products. What are you seeing in Internet2?

MR. WOOD: Thanks. For those of you who don't know, Internet2 is about 190 universities, about 70 companies including six that are around this table right here that have basically deployed to about three million people, 10 to 100 megabytes per second, symmetrical broadband connectivity. I was reminded when you asked the question that the web is really a 20 year old overnight success story. During the early Internet days, people were asking what are we going to do with this? It might be akin to trying to figure our in 1998, 1999 what we were going to do with 10 to 100 megabytes per second.

Today fortunately we have a little bit of a better idea. I think one of the largest things we're seeing growth in our university community is the ability to connect instantaneously with TV quality video. Dr. Allenby talked about the psychological benefit. It's interesting. We talk about streaming video and email and the web but people really use outside frames of references when it comes to the network services that they get. So they think of TV or film as the kind of quality that they want to have for interacting with

people at a distance.

One data point there after September 11, we--within a month--configured a meeting we were supposed to have in Austin, Texas to be virtual -- that is, people would be able to participate with TV quality video. We actually got more people interacting real time, symmetrically, virtually, than we were expecting in person.

To answer your question directly, we really are at this pivot point--as somebody else mentioned--of seeing people being able to take advantage of pervasive, always-on high bandwidth symmetric environment. It's not just about doing email better, doing the web better, or being able to view quarter screen video of Tiger Woods at the 17th hole. Not that I do that. It's about complete new kinds of applications, new ways of interacting that you wouldn't expect going into it.

This discussion about trying to figure what you're going to do with the connection, I imagine people 100 years ago were trying to figure out if they should put light bulbs in their offices or electric motors on the factory floors when electricity arrived. I think what we're going to see as this kind of bandwidth, this kind of network, become more pervasive is that people are going to do both of those things and include the

other completely different things that we don't have now.

MR. REDSHAW: I think there is a distinct advantage that we're going to experience in the United States tied to that, taking it up to a little bit of a macro level. I think it's because the generation that's coming up is radically different than we are. I think there are two little bits of evidence. We grew up playing competitive games where the rules are pretty clear. We're scoring points and we're competing against each other.

Anybody under about the age of 23 grew up playing on-line games where it's not about just scoring more points against the other one, it's about strategy. I don't know about you but I didn't play any games with strategy growing up besides maybe chess. I was really bad at that. I had no strategy anyway.

The other thing that's going on is that if we said okay we're going to have this meeting but we're all going to blindfold ourselves so we can't see each other. It's not going to be a very good meeting. How do we communicate? The communication models of the kids coming up are blindfolded. It's a natural way to talk about things and to interact. So I think that's going to

help.

The third thing is just a little anecdote -- a very brilliant and unusual individual who coined the term "virtual reality," and I did a conference and he was talking about the latest, greatest things in virtual reality and how they are helping surgeons. I asked, “What is the most amazing thing?” He said, well we bring these surgeons in and put them in virtual reality and they figured it out in about six weeks. We bring in these 12 year olds and they figure it out in about six hours. When you talk to the 12 year olds and say, “wow how did you do that,” they said “I'm not good at this. You should see my eight-year old cousin.”

I think that's a good news story for the economy. I think these things are going to flourish as that age group changes.

MR. WOOD: I just want to add one thing if I may just quickly. University graduates that are coming out of colleges -- including the guy who invented Napster -- are going to be moving into the work force in the small businesses and large businesses with exactly that sensibility.

SECRETARY BOND: Professor.

DR. KOFF: I'd like to suggest the dark side of this blindfold which is that we do interact

blindfolded all the time when we call people on the telephone. It's not clear to me how people really feel about interacting with high video connections. Do you want the party to see the crumbs on their cheek or the fact that you're not wearing a tie?

I think part of the problem we've had in the discussion here is that we end up talking about systems integration and business models of which broadband is one element. So we move away from a discussion on productivity and broadband in particular business models that are important to the people who are going to implement them and thinking strategically about all these choices they are facing. But if you look at broadband in a more mythical or rhetorical way, it's really the way that consumers see broadband, which is primarily through active video.

I note that when Verizon (and I don't know if this is still true but it was true when I got DSL) can provide you a free little camera to go with it. One would think that this might be a useful way of testing whether individuals are really interested in interacting with other individuals as a higher level of bandwidth that is to say have a visual along with the audio to not be blindfolded.

Then I wonder when I hear Dr. Mularie

concerned about asymmetry. They are only going to experience this interaction at 200 kilobytes per second. Is that experience going to sour them in the same way that the limitation of picture phone soured us on this 40 years ago.

SECRETARY BOND: Chris.

MR. CAINE: A point was made earlier about the macro implications of this. Since we are talking about this section of strategic change, I think it would be good to at least put on the table the phenomenon that seems to be developing around grid computing and what that has to do with economic growth and productivity enhancements. We are starting to see some early experiments around the world with grid computing because what it ends up being is a virtual set of distributed IT services for many of the challenges that we were talking about relative to small businesses or businesses who can't afford to buy new technology and update it or who don't choose to buy new technology or they can't handle the skill set required within their organization large or small to stay current.

This is why we see a market trend toward IT services and enterprises public or private saying you just handle this for me. This is what I want. This is the price at which you

guaranteed it to me and I will measure you. If you don't do it, I will go over here and get it over here.

Grid computing has both a communitarian opportunity affiliated with it, and this is where we see it most taking hold now primarily, in university environments, but it also could have an economic opportunity affiliated with it. It could be the link that allows the small businesses to come together so they don't have to buy all the technology that changes every minute. They don't have to make the choice of “when do I hop in and for what do I use it.”

So I think whether you're looking at the first initiative in the University of North Carolina that has established a grid designed to primarily bring together 60 organizations around biosciences or something else, what are both the research and economic implications to that. We would be well served to step back and look at an economic development or communitarian development aspects of grid computing. It is where the functionality will reside in the network and not have to reside necessarily on the premises.

You can't have grid computing without broadband clearly. So broadband becomes a fundamental requirement to enable also my phrase

democratization of computing and IT capability when you use a grid as your approach.

In this case, grid computing may be a killer app for broadband. It may just be because it's going to increase the number of stakeholders who would have a stake in finding value coming off of IT collaboration and IT integration.

In the UK the Office of Science and Technology is building a national grid to link eight universities together to make those universities operate more efficiently around high performance computing for a variety of different discipline scenarios. Each one of those universities I bet is already working closely with local small businesses there. I do think there is a topic that I would recommend that we explore further today or some other time around what are the economic advantages and productivity gains that could come from a extension of a concept of IT computing to this model that we now see developing called grids.

SECRETARY BOND: Under the pressures of time here, let me go to Marilyn Cade and then we want to get to our last presenters.

MS. CADE: I want to just say something that's really coming across to me that I hope we don't miss in terms of a message and it has to do

with something that the gentleman with NFIB said earlier. We have four million business customers. The numbers would indicate to you that obviously the vast majority of those are small business customers.

Our distributed work force, which Brad did not mention earlier, most of our service support workers are what we call distributed meaning they telework. They have to have access to all the tools to be able to support the problems that that business users or home users are encountering. One of the things that we are encountering over and over again is the challenge that we hear from our small businesses about modularization of the applications, simplification of the applications , the ability to start small and then migrate which was a point that you made earlier, and the need for case examples. I think it was something that you said earlier, Paul.

People in small businesses and large hate being the early adopter. It's risky to them. But in the larger business, there are more resources. There are studies by McKenzie or consultants who can come and help them. In smaller businesses, they desperately need it seems to me the story coming to them from their trusted trade associations of how someone else has adopted an

application.

I would make only one other point. Let's be very careful not to think that bringing broadband is the answer because without the appliances and without the applications these small businesses in particular can order broadband but after it gets to the door what do they do next. That's what we hear all the time from our business customers.

SECRETARY BOND: Very good. Another brilliant segue. Thank you. We've heard about some serious efficiencies that are capable inside companies and outside. We've heard about some serious opportunities for businesses of all sizes if they becomes eBusinesses and some developments under way that maybe will give the small and medium sized business operator more visibility so they see an ROI. But there clearly still are barriers. We turn for discussion on that to Bruce Josten from the Chamber and Stagg Newman from McKinsey. Bruce.

MR. JOSTEN: Thank you Phil. What I would like to do is add to this by sharing with you some excerpts of two surveys, one that the Chamber itself did in the fall of 2000 reaching out to about 30,000 small businesses up to 100 employees which had over 3,000 responses to that and another one done by the Canadian Chamber of Commerce at the

request of the Canadian eBusiness Roundtable. I think the intersection of the findings is instructive for all of us with respect to today's issues that are being raised.

The first survey done by the U.S. Chamber in this country showed us that for these small businesses, American companies, computer technology let alone broadband technology is a useful Internet tool but not yet seen as a pathway by the majority of them to customer commerce. What they said they are doing day-to-day falls into pretty simple categories. Eighty percent use Internet or eBusiness technologies to maintain financial records. Seventy percent use it for "day to day business functions." Sixty-three percent conduct some on-line research. Fifty-nine percent use it to communicate with customers. Forty percent track inventory. Twenty-eight percent use it to manage product distribution and fourteen percent for on-line employee recruitment.

These companies view information technology very much as an internal tool to handle their bookkeeping and correspondence. If they use the Internet it is principally on-line research or email today. We believe that these companies have not made more use of Internet business solutions because the value proposition which has been

discussed a lot around this table today has not yet been demonstrated to them.

According to our survey the great majority of these businesses keep up with Internet developments principally by word of mouth and secondarily by a magazine. Less than half of them say they keep up with developments through contacts with their vendors or their consultants. In short, the lack of uptake may in part be due to industry's failure to market directly to this segment either as a group or across different grids by different sectors.

The industry appears to be missing perhaps an opportunity to create the market for Internet business solution. This is, as it's been pointed out, numerically a huge marketplace. It would seem that broadband's success will require an imperative to drive down into the small business segment.

Our survey reached a broad spectrum of businesses, the largest segments of which were manufacturing, followed by construction, then retail and last professional services. The results we found suggest that these local businesses with local employees and local customers do not yet perceive an adequate return on any increased investment in Internet technology.

Eleven percent had no Internet connectivity whatsoever. Of those that did have Internet connectivity the majority 55 percent use a dial-up connection. Although the respondents expressed considerable dissatisfaction with that dial-up connection few said that they intend to invest in an upgrade any time soon.

About half of these respondents did have websites. Most say they use their websites simply to advertise their products, services and existence. Only a fifth of the respondents with websites used them for eCommerce activities. The half that did not have websites don't think that websites today are worth their investments. They also felt that having a website today was still not relevant to their business model.

Some had concerns about security issues. Clearly for these respondents the value proposition was not there. eBusiness must be proven as essential to the firms. Small and medium sized businesses simply demand clear proof that their investment dollar will bring them a return.

Virtually all of the responding businesses have some level of information technology hardware. Most however feel that they have enough hardware. Half of the responding companies spent less than $10,000 on information

technology in the survey year, which again was the fall of 2000. In fact, 30 percent of the companies spent less than $4,000 and only five percent of those responding spent more than $100,000. A very low percentage had any plans to acquire additional hardware in the near future. Four percent said they planned to acquire local area network. Only two percent planned to buy new desktop computers in the next year.

Let me share with you the Canadian study, which was conducted in March 2001. They tried to answer and find out from their analysis what are the barriers impeding eBusiness adoption among Canadian small and medium sized enterprises.

This study identified four key barriers inhibiting uptake and use of eBusiness by Canadian small and medium size companies. First among them again lack of information and education and understanding the application. Uncertainty surrounding the cost and the benefits of eBusiness was the second. Thirdly access to and the availability of strategic eBusiness resources. Fourth security concerns one more time.

Within those four broad categories there are several unique inhibitors, many of which were also identified in our own survey. These

include: lack of return on investment, lack of skilled workers and talent at the firm, need for more strategic advice from their suppliers, lack of management commitment, low usage today among their customer base, and security, privacy and other legal issues.

The Canadian study reached several conclusions. eBusiness adoption among small and medium sized companies is closely linked to their perceptions regarding the importance of the Internet and how they believe it will impact them in the future. Small to medium size businesses demand clear proof of the return on their investments. The smaller the firm the less likely it is to use the Internet. The older the key decision maker in the firm is the less likely they are to use the adoption of the Internet as a business tool.

While the barriers inhibiting eBusiness adoption affect all small to medium size businesses they apply differently depending upon the degree to which the business has begun to adopt eBusiness strategies. For example, businesses not using the Internet cite cost and return on investment as their primary inhibitors. Whereas those that are using the Internet cite transactional and security issues as inhibitors of concern to them.

The results of our survey and the Canadian survey are fairly consistent. We believe these surveys continue to highlight the demand side problem. To fully leverage the possibilities presented by the emergence of the digital economy I would state again that it would appear to be imperative that the small and medium size businesses lead part of this charge and become sophisticated users of eBusiness technologies. Maybe the grid aspect of this is one way to drive down cost and increase the applications.

Until these businesses are convinced that there is a reason for them to make additional investments in advanced information technologies it appears in the near term these businesses will stay on the sidelines. I was reminded as I went through this of the old Chinese proverb. Tell me and I'll forget. Show me and I may remember. Involve me and I'll understand what you are telling me. Thank you.

SECRETARY BOND: Thank you Bruce. A good summary of the cultural challenge. Stagg is going to tell us a little more on the technological barriers.

MR. NEWMAN: I'd like to thank Bruce, Phil and Kathleen for inviting me here. Bruce gave me the task of delivering the bad news. It's not

all bad news. Maybe to inject a little bit of reality, Dr. Koff I think mentioned the tremendous improvements in communications technology. To put that in perspective, the first telegraph went in as a few ten of bytes per second and the first fiber optic system about 100 million bytes per second so we had a million fold increase in communications productivity over about a century and a half.

Those systems went in with five people laying the cable at a mile per day so we had a zero increase in productivity and construction because you had roads and concrete and those things in the way. The first however took 45 days and one regulator to approve it. The fiber optic system was about three to four years and hundreds of regulators. So we had about a 10 to the fourth decrease in regulatory efficiency. We need to look at the total problem not just the technology barriers.

First to understand that let's look at the costs versus affordability question. Today about five percent of business buildings depending on how you want to measure them are on the fiber network, on what everybody here would agree is broadband. Some people would include other things in broadband. Some wouldn't but only five percent are on the fiber network.

These companies are reaping all the benefits of the increases in fiber optics technology, gig [abit Ethernet] and a lot of wonderful things. However even the optimists would say that a rational communications company would only build fiber out to about 11 percent of buildings, representing less than half of the telecoms spend today. So one of the critical things we need to be asking ourselves is how do we get the small to medium enterprises, the other 90 percent of buildings which are a small number of employees, on the broadband network.

There are basically three ways. One would be to decrease the cost of the build. I'll say more about that. The other is to exploit alternatives and that would be exploiting the copper network of the tel. cos., the coax network of the cable companies, wireless networks, other things. Maybe that will be good enough.

North Carolina led the nation in the so-called farm to market program in the 20s to get the farmers out of the mud and build paved roads. But they only originally paved half a road length because they figured if you got two wheels on the pavement that was good enough to get you out of the mud. Maybe we have to be realistic and consider what those half paved roads are. Finally is to

increase the affordability. Can we increase the affordability so that 11 percent really becomes 20, 30 and eventually 50 percent or more.

If we look at the realities I think it is important to remember as a country we have significant disadvantages in building out the broadband infrastructure. We have advantages. We are the wealthiest country in the world. Yadda, yadda, yadda. But the cost of building out broadband is inversely proportional to the linear density. The more customers per mile the easier it is.

If you look at Taiwan every thing is vertical. You can get a lot of customers in a hurry. If you go out to rural parts of North American one customer per mile your economics are really bad. We have to realize that we do have some disadvantages some of which are our own making. We've the most government regulations, the most expensive right-of-ways. We have construction codes that do not permit to the point of technology being deployed in Europe to install fiber. So there are a lot of practical things we need to look at to change these construction costs.

We have the least amount good wireless spectrum available. There are wonderful wireless alternatives but they need to be down there using

that spectrum that everybody else has. We really need to look at how we can make more broadband wireless spectrum available for all players, incumbents and new entrance.

Quite frankly we have the most expensive tel. co. network to upgrade just because of the physical architecture. We do have the best network to serve the businesses. The Motorolas, *et cetera* are well served but the rest of that telephone network is expensive to upgrade. To give you an idea, if you are going to build out this network if you have existing poles, it's two dollars per foot to build out a network. If you have to pull it through conduit, it's four dollars per foot. But the reality is to build out to most of the networks, you're either going to have to do directional boring at $20 per foot or trenching $100 per foot. It's a half million dollars a mile. That's a lot of money to spend.

We also have to remember the operational cost. A little personal experience, I moved to rural North Carolina and I'm actually in a fairly high linear density area. Everybody lives in the valleys. I lost track after about a dozen truck rolls to get just ISDN digital services out to my home. The people were all very confident, willing, diligent workers. Eventually I did get my

digital connectivity.

The cable company also came out to hook me up to cable. They said it would only take one day to dig a trench to my home. It took them three days. They got a 220-power line, a sewer line and two telephones on it. This is the real world. And both these companies were competent companies with good employees.

Generalizing that to the telephone companies' credit it cost about $200 per year I think if my telephone folks would agree to provide the operational expense for a telephone in the home per subscriber per year approximately. The average desktop computer in a corporation is about $2,000 per computer per year. So we have to get to the operations scale and scope to play back to what Secretary Cooper said simplicity. How do we simplify this so we get this environment down to where the operation cost is affordable and we tackle the construction costs.

So that's on the supply side. Affordability and I think there's three key areas and most of these have been touched on today so I don't need to say much. One is offering integrated solutions, broadband, voice, *et cetera,* together that really lower the cost for the small to medium enterprises.

If you look at that affordability and you realize that most of telecom spend is still for voice in this small to medium enterprise world then you really don't have a lot of money to go after that broadband build unless you can show that it really makes sense to integrate your voice and your data. That's not an easy sell because that voice works pretty darn well. You go and say why don't you integrate it over in this new way and the small to medium business enterprise says and will my voice work as well. Not so sure about this.

So business has to come up and show that there is a way to reduce cost or we really need new ways of communication. Two-way real time human interactive services, maybe that is the key. I think a lot of people forget that the Internet was around for well over 10 years before the worldwide web came along. What the worldwide web did is it tremendously improved the productivity of developing client server applications because it reduced the software development costs by about a factor of 75 percent. So what is the next higher layer magic, middleware, whatever you want to call it to enable this new set of application?

Finally the third would be to change the "who pays" model. I think that one thing that's spreading teleworking certainly in my case

is that my employer pays. That changes my willingness to have it certainly.

Maybe we need to rethink models of how we get this out there. Are large businesses going to pay to get their trading partners hooked up? Don't know. That would be one thing. The government pays? Not likely in the U.S. But we need to rethink through the whole model.

Despite maybe putting some bad news out there, I am an optimist. I would like to say that in this country we have had a lot of speculative bubbles followed by bust: building of the canals, building of the railroads, and building of the electric companies. After all these busts, you have the greatest period of investment and ultimately the greatest productivity improvement. So I'm hopeful we're right at that period now really ready to start the growth. Thank you.

SECRETARY BOND: Thank you, Stagg. It was a great discussion both the supply and demand challenges out there. You have something to say Bruce. I thought you were raising your hand.

MR. PHILLIPS: Yes. I thought both comments both by Bruce and the Chamber of Commerce and Stagg's comments were right on. I think small firms will increasingly eventually invest slowly in broadband as they grow. The lady from SBC made the

point that “who would not want to network ten PCs.” Many small firms don't have 10 PCs. They may have three or four or one. That's still a challenge. So the growth phenomenon in the computing phenomenon that was observed by Chris earlier are two promising strategies.

Several of the things that I clipped, before coming over here, was three bills. Just turning the tables entirely and a little bit more in a political taxation environment something we're interested in at NFIB. Governor John Engler, from Michigan, on March 18 – (I just pulled this from the clips from the Daily Report for Executives from BNA) signed three new bills. But more importantly, he created the Michigan Broadband Authority. While we sit here and talk about this in Washington, the states are doing things about this by increasingly passing new bills. Hopefully they will be more in touch with their local small businesses both through hopefully some organizations, other technology organizations, small business development centers around the country and so on.

But most importantly, one of bills that Governor Engler signed SB899 "provides tax credits for new infrastructure and right of way fees for providers." I don't know exactly in dollars because I haven't really studied what this will

mean. I intend to download this and read it to see what the bill might provide in terms of incentives. But I think this is another way to go that's much more locally based. Small firms do respond very quickly, not surprisingly, to the words "tax incentive" and "tax credits." If that can be done at the state level to begin, it will progress faster, while whatever is meshing around in Congress continues to churn too. There may be lots of incentives that can get more rural firms up at the state level as the states continue to do this on an on-going basis themselves.

SECRETARY BOND: Stagg.

MR. NEWMAN: I'd just like to echo and reiterate what you said. I think a lot of this needs to be solved from a public policy standpoint at the state and local level. We really need to advocate best policy, best practices on constructions, right-of-ways and all of that. I think that's a great point.

SECRETARY BOND: Harris.

MR. MILLER: I would like to simply get back to basics. We're talking about very important things but let's back up to basics. I think most of us would agreed that eventually there will be broadband and it will be ubiquitous. We're trying to shorten that eventual cycle. We're trying to

get through the apparent slowdown. Whether you think the glass is half full or half empty, we all agree we would like to be faster. It would help to drive the telecom. It would help to drive IT. It would help to drive content providers.

So the question I thought we were trying address overall is anything we collectively as government and we collectively as industries collaboratively can do to get us through this period when a lot of us are dissatisfied with the rate of adoption. I think we talked around a lot of that but I think that's what we ought to come back to at the end is what can we do collectively, together if anything, to do that.

We can just wait for the natural forces to do it as Stagg pointed out. Eventually all these busts ended up with some booms but I guess we all believe because we are optimistic or because we need to believe if we can drive it. I would like to focus back on some of those things we've heard.

A lot of what we've heard is about the big business community. I'm not sure we can do a lot about that because, as it was already pointed out, there are lots of studies and a force out there to drive that community. So we're basically focusing on the small business community and we heard a lot from the two Bruces on that. We've

also heard about the individual consumer community. Those are the areas where I think there's some disappointment that the adoption rate has been much slower.

I would suggest that we try to get back to some simple basics that I obviously defer to the two Bruces about this. My sense of the small business community through decades of research is they tend to be late adopters but they all tend to be from Missouri. Show me. If someone can show them a benefit they will in fact do it. I'm also grateful -- brought up Gladwell's book about tipping point because once people start to talk about it and talk to through friends that where the information comes from. But it seems to me that we ought to be focusing on what kind of applications either are out there or can be out there that can help bring us to that tipping point where small businesses say “I have to have that.”

I don't think it’s legislation. I don't think it's regulation. I'm not saying that those issues aren't important in terms of driving and helping the people on the supply side. But on the demand side, what is it?

I was very excited recently when we had our World Congress of Adolad (PH) and Ziggy Zwikowski, the CEO of Telestra, which is the

largest telecommunications firm in Australia, announced $100 million Australian, which is about ten cents U.S., that they are providing a pool of funding to be available for people to develop applications. He believes they've driven a lot of the supply side and he needs help with the demand side so he's put up a research fund in companies and researchers and content people to help them get research dollars to help devise these technologies.

Maybe that's something we should be looking at. Maybe Ziggy is on to something. I don't know. But I thought it was exciting that someone who you think would be talking primarily about the supply side issues was in fact talking about the demand side and how we can create that.

Secondly in terms of government's role, I think government as a model is pretty poor. I'm not recommending this to the Department of Commerce but I go back to my opening point. If I'm sitting there saying telework is a solution but I don't see government doing it, then why should I do it? I think again small businesses would be much more responsive if they saw government doing it. I think that's something we need to focus on.

Thirdly, I think we have to focus more on the fact that there is no single killer app.

The more we keep using that term I think the more we're going to get led astray here and a couple of people already said that.

Finally Marilyn talked about maybe it was up to the trade association maybe there could be a collaborative project between the trade associations generally and government to come up with information that NFIB could distribute or the Chamber could distribute about not killer apps but lots of case studies that then the supplier community and the demand community could go out and explain okay this pharmacist made more money because of this. This is what drove me and made me more money because of this. This office supply store had lower costs because of this. I think it really comes down to those kinds of basics.

SECRETARY BOND: Thanks Harris.

DR. MULARIE: Just one comment and I agree with all of that. There's another industry I saw represented at the table and that's the local towns or environments. If you look up in the case of Bristol, Virginia they are in southwestern Virginia. They are hundreds of miles from anywhere. They as a town decided it would be to their best interest to fundamentally help provide the infrastructure, fiber optic infrastructure, in their town. And their short-term experience has

been many corporations are moving into Bristol, Virginia.

They said further than that there are companies that are looking to locate in rural areas, that look not at the road map, but at the telecommunications map. What's underground? Where's the broadband? Those areas that have the broadband are really seeing the advantages of the scale. I think that's driving demand. I think that one way to drive demand is to provide the infrastructure.

SECRETARY BOND: Skip, you had your hand up.

MR. TAYLOR: Thank you. Skip Taylor from Fiberlink. I've had an opportunity I guess in the interest of improving strategies and affecting change and so forth. I spent a lot of time out in front of the customer. What we're seeing right now and I don't hear a lot of is there is a lot of pent up demand for this right now from the businesses. Granted we spend most of our time dealing with larger corporations so our small business typically is being pulled in from the big businesses to get broadband technologies. By just being able to speak to them and get a sense from what their barriers are and what are some of the issues that they are looking for people to help them with, I

just jotted down a few thoughts that I received from a lot of the customers.

They see obviously the benefit of faster content delivery, but they really are focused on cost. We talked about trying to find the killer app. I'm sorry, right now it's cost. And the funny thing about cost is that as soon as you start talking about just save me money to get past that little objection in the sales cycle, they next want to talk about quality of service. Now how fast they take cost and expect the same kind of quality with access. That talks about availability, up-and-down time, troubleshooting support, all those issues continue to be somewhat of an inhibitor while they seem to be moving forward pretty rapidly.

They want national deployment for this. There are individual regions that are set up. But when they want to do something on a national scale it's very difficult to find a provider in the middle that has the relationships necessary to help them deploy on a national level. So we see that as a big challenge and quite frankly a tremendous opportunity for a service provider.

Corporate access without compromise and security. I guess it was in about October 2000 a pretty big piece of noise out a major Seattle based

corporation I won't mention had a little bit of exposure to a broadband connection. Customers, especially enterprise customers, are so focused on making sure that they have a VPN set up regardless of the transport for protecting the data. At the beginning you have more and more always -- on connectivity, it's a device that equally exposed. So being able to have services and solutions and set up and address intrusion detection and prevention would also help get some comfort in the interest in expanding broadband.

We're looking at customers that have security policies. They don't want to change their security policy just because there is a new form of transport. That particularly drives in the wireless spaces as well. You are seeing tons of hype about 802.11 on a roaming spectrum, 3G, 2.5G. Pick your technology. But all those are just transport. What is it that's going to continue to secure the environment for even small businesses. But as they talk to large businesses through an enterprise connection that they are forced to do, they have to have protection.

From an applications standpoint, frankly as far as protection it's generally email as much as I hate to say that. We're seeing a lot of inventory and order entry control. We're seeing

an awful lot of pull right now from the retail folks. They really see this as an economic great for them. Some of the challenges of deploying are somewhat more difficult in retail markets than they are in the whole market in certain pockets of the country.

I guess the last area that Stagg, you touched on briefly as well. I had a opportunity to visit the Pac. Rim about four weeks ago. I got one marketer from South Korea demanding that we do broadband connectivity in South Korea. I'm sitting there asking him to help me understand the business models in South Korea that we as a service provider can come in and help.

The first thing that was said to me was, “well we have 75 percent coverage of broadband.” Now once again I'm looking at myself. Seventy-five percent coverage already. What is it that we can do to step in and help offer broadband with 74 percent coverage? It really is amazing when you have an infrastructure by geography how much more concentration has moved in Japan and South Korea. They are offering DSL connectivity for $3.00 U.S. Just phenomenal. I saw that on a train when I was over there.

Some folks have it. There is a demand for it. But from an enterprise/security

perspective, they want to make sure that it's protected and they're not being compromised but there is some momentum. That's just from my perspective that I'm seeing from my customers.

SECRETARY MEHLMAN: Can I follow up on that one last point that you made, Skip? In the Pac. Rim, especially in Korea and Japan, are they finding that at those prices small businesses as well are signing up in droves and finding uses for, suggesting cost plays a greater role than knowledge or understanding?

MR. TAYLOR: I don't know Bruce if I can answer that. I'm seeing a very strong consumer stride at least what anecdotal evidence I saw when I was there. I'm in a train heading to the airport and it's 1.5 per. I had to do my Yen conversion very quickly but I do remember $3.00. But it's really phenomenal where they are taking this.

MR. MILLER: Bruce, we met with your South Korean sister association in Australia and they said no. Skip is right. In high-rise buildings, individuals have it but when people have to pay for it really they are also finding a lot of resistance. Let's put it this way. They haven't found that their business people are convinced that they should spent the money. Because if it's basically free in your high rise, sure people take

it and $3.00 is pretty close to free.

SECRETARY BOND: Rhett.

MR. DAWSON: Back to this whole notion of what could government do, I'm speaking to Secretary Cooper. One thing we could do which is a persistent theme today is we really can't measure the improvements. That's something we could do a lot better job at to drive both from a macro point of view but also really understanding that it's not just about business processes we are simplifying. It's also about investment, which is the second thing that we can do. You can make it depreciable -- to track more closely to the useful -- to tax credit. That would be a major step forward. [The depreciation schedule] is hopelessly out of date in terms of the information age. It has to be changed and we're going to be trying to push that forward.

The third thing and people have said this obviously about the regulatory affairs. You really can't make the investment something that people get to keep and grow and taken away from that.

SECRETARY COOPER: The assets. Who owns the assets? Is that what you are getting at?

MR. DAWSON: Right. So those are just three building on the other parts.

SECRETARY COOPER: Thank you.

MR. RYBCZYNSKI: Yes. I just want to turn back to the enterprise side. Let's say medium size enterprise. One of the things that we find is really understanding the total ownership part that was mentioned.

Let me just illustrate that through a lot of discussions with schools which are in a way medium size businesses of sorts. What they are doing is putting Ethernet running out over fiber to their elementary schools and the total cost of ownership modeled is take the servers, take the firewalls, take the routers out of the elementary schools and put those back in the school board offices. That's really the business case behind it as folks get real excited about bandwidth. That's why they want to do it because they get it and maybe it's because one guy is responsible for the whole shooting match.

But this whole function of using the bandwidth to really simplify their environment and understanding that it's not just the initial cost of the box or the two or three people that you have working on it. There's a total cost associated with the old way of doing things, which is distributing all that stuff all over the place. Then having to manage it and so on and not really understanding what that's costing them in the long

run.

SECRETARY COOPER: Can I ask one question? I've heard two different directions here as far as what the Federal Government should be doing and then there was also some discussion by Stagg down at the end and a couple of other people talking about doing this from the state and local levels and whatever policies or incentives are provided. Obviously we end up doing a little bit of each.

On the state and local level, I wonder if there is concern as people talk about this or propose it that the state would be coming at it from different point of view, might offer incentives for different kinds of systems, different kinds of set-ups if I'm using the right terminology. If not, forgive me. That would make the whole system not work as well together when it's all put together. That's something that's on my mind and I would be interested in any thoughts along this line.

SECRETARY BOND: Paul, go ahead. Then Harris.

MR. NUNES: Just a quick comment to that I think would be the question of uncertainty again. It's not so much what actions could occur but not knowing whether it's going to be something

different from the state, from the Federal, and what benefits it's going to provide. The uncertainty of the benefits makes the uncertainty of the profitability of the application that's being considered.

Also I think another strong thing is which I mentioned before competitors. The uncertainty that if I do it today I'm going to lock myself out from benefits that my competitors might see tomorrow or a year later from government activity. This is a very real concern to the people we talk to.

MR. MILLER: This might be an un-original thought but I think it's relevant. I know there's a lot of concern among state CIOs right now that when the Homeland Security money for first responders gets distributed between that other organization, it's mostly going to go directly to local governments and not to the states. So the states' CIOs are very concerned that you may see a lot of new bandwidth being developed and technologies being developed that are incompatible with each other and with the state's responsibility to coordinate first responders. It's somewhat of a boggle to address but I think it's directly relevant because that could be driver of broadband in the state and local communities because of the

Homeland Defense responsibilities.

SECRETARY BOND: We are trying to do a lot of work on the interoperability issues for first responders. Stagg and then down here.

MR. NEWMAN: I think at the Federal and state and local levels the important thing to do is to understand the barriers and try to see what are the best practices to eliminate. I'm less concerned about trying to set standards in communications because I think the marketplace does a better job than the Federal Government. Europe has been trying to set standards for data communications for years, OSI model which was a non-starter, *et cetera.* Where the Internet even email if you look at them, everybody said France was way ahead of us right with their minitel.

I think the need for Federal standards or government-orchestrated standards is less critical. But I do think looking at that barriers federally as a tax incentives and disincentives, investment incentives, disincentives, the spectrum issue is a Federal issue clearly. Then locally a lot of the construction practices, right-of-ways, *et cetera*, but getting those best practices out there, I think would be a very important role.

MR. RYBCZYNSKI: I just have a slightly different angle. There is the policy side. They

could be very small communities like Virginia Beach or fairly large like Citinet in Chicago or a whole state. The Government of Alberta has taken the approach that they put some seed money to fund the deployment of fiber in 100 some odd communities around the Province.

On one side, it's around internal efficiencies, getting to their citizens better, but also making sure that they do this in the way to encourage business to prosper and therefore make this jurisdiction compete better with the next province, the next state or whatever. That's happening right across the country.

One article I was reading suggested that the competition is decreasing effectively among service providers but the city governments are, maybe in the form of not quite service providers, certainly become a major new factor.

They certainly don't want to become a full service provider but things that they are doing can have a positive impact or a negative one on the industry.

DR. MULARIE: And in the case of Bristol Virginia government can prove disincentives the RBOC finally sued Bristol and said you can't prove this information with this structure. And – the court upheld Bristol's position in the

Commonwealth of Virginia has sided with the RBOC in its suit against Bristol. It's a case that communities do something different. Government does something different. As somebody mentioned a thousand regulators per mile on this new telecommunication infrastructure. Just an example that if government when policy is not cut up that it's possible -- (Inaudible.)

MR. REDSHAW: I definitely think that there's an extremely positive side to how government can be involved in this and help facilitate this. To argue with Stagg for a minute and let me just preface that by everything we're doing in this area, and that I'm leading in Motorola, we are doing it with McKinsey. Just to be safe on that account.

I think large firms are going to solve the dynamics of the problem that you stated for small and medium businesses. I think they are going to do this for three reasons. That is creativity, fear and Willie Sutton. The first one if you look into AT&T or IBM or Cisco or Motorola and you look at the research and the scientific ends of the business the product development groups there is just a plethora of certified, smart, off-the-chart, creative people working on this problem.

That is a focus that helps tremendously.

I think inside all these corporations there's fear because we've all seen WalMart who are an eBusiness paragon who have a 14 percent SG&A advantage over Kmart and what have they done to Kmart? All the churn in desktop computing, PC, small server business is in large part due because Dell, another great eBusiness company, has a negative day sales outstanding and the others don't. So I think that internal fear, that at a corporate level we're all thinking, better not let that happen to us, is a driver.

Then I think it's the Willie Sutton factor. When they arrested Willie Sutton, the famous bank robber, and asked, “why did you rob the banks?” He said because that's where the money is. All of us know that and we have to solve our own cost problem but the small and medium business is where the money is in the future. I think those things conspire to help create those dynamics. I think you're going to see new technologies to get us through that last mile problem coming out.

SECRETARY BOND: Chris.

MR. CAINE: Coming back to Kathleen's question about what the Federal Government can do, there was a statement earlier that the government ought to lead by example. If it's committed to the

leveraging effects that broadband can have on productivity in this country then it ought to have a good case study about how it leverages its own productivity. So my simple question is does the government know how many of its non-headquartered buildings are connected to broadband around this country or around this world? Commerce Department, do you know how many of the non-Washington facilities in the Commerce Department and its sister agencies actually have broadband connections so that your employees can utilize it in the performance of their duties? I would like an agency like the Agriculture Department that has the extension service is a very good model for pervasive and mobile computing where having greater and more robust information at those employees' fingertips as they are out doing their job around the country would be a powerful case study for why broadband can increase productivity and leverage economic advantage.

In fact, to my knowledge, Phil, unless you have come up with something in the last two weeks, --

(Laughter.)

MR. CAINE: You're ability to answer the inventory question about government assets is a little challenged right now.

SECRETARY BOND: We went out and hired this IBM guy.

(Laughter.)

MR. CAINE: And the report is due next week. Right?

MR. BROOKS: To that point about looking to the government to lead us, I think if we ended up waiting for the government to lead us into the web, waited for them to lead us into a lot of technology fields, we would fall from the largest broadband market in the world to somewhere in the top 20. That's not really a source of innovation, not really a place that a lot of business areas look for --

MR. CAINE: That wasn't my point. My point is if government is going to be relevant, then it's actually going to lead by example on what it says it supports. Otherwise government will continually marginalize itself in a society that is moving faster. Its citizens or youth doing things that they are not doing.

MR. REDSHAW: We may --

MR. BROOKS: If I can finish a point. One of the great ways in which the government has helped to stimulate the demand and get that level of understanding among consumers and business owners who often overlap is getting broadband into

public places, library projects, school projects, are really quite important in conveying the value proposition. The biggest impediments to the U.S. broadband market right now is really just availability.

If you look at small business owners and consumers who are really the under penetrated part of this market because when you go 10 employees north you're at about 81 percent penetrated for broadband. So it's the small segment that's under penetrated among that group over 20 percent intend to buy broadband this year. But in actuality less than half of those people will actually end up subscribing in part because of cost once they explore it and in part because of availability. A big part of this is a lack of competition. Once one broadband provider gets into an area, another one quickly follows and you end up seeing much higher penetration rates there.

One of the things that I think the government could do to help drive penetration is to foster retail availability of a lot of these solutions. If you look at a provider like Cable Vision that is at 17 percent penetration of all of their homes passed which outdoes the average for most broadband service providers, which are around five percent.

The biggest single difference is their very aggressive retail strategy. They have consumers and small businesses out there paying for their own modems, signing up for the service. It ends up being more profitable but it's out there where consumers see it. To the extent that we can foster greater retail availability, continue to foster understanding of what broadband is in demonstrations, libraries. A number of broadband service providers have set up booths in shopping malls and like to help foster that. It will help accelerate beyond simply the college age audience who is coming out with an appreciation of what's available.

SECRETARY BOND: Mike. Then one more. Then time is going to constrain us.

MR. WEIR: So this is not a policy comment because it's not my area of expertise. However, Bruce's findings, there is this opportunity around education in terms of what are the possibilities. On the end product side we spend a lot of time in that space. In fact last year we helped study 300 corporate businesses at Cisco to understand lessons learned from Cisco. The problem with following the businesses that is not an aggregated demand. It's demand but it's fractured. That may be a great opportunity in

terms of driving down the educational aspects in terms of what are the possibilities which then would possibly pull some of the retail relationships around this specific applications that might be available by market, by provider, by solution, distributor, *et cetera.*

SECRETARY BOND: There have been some interesting cases around the country of people creatively aggregating demand. Whereas they are beginning to talk about elsewhere around the country. Right here.

MS. MAMUZIC: I want to comment on a point that Skip had made that I don't really agree with and that he had mentioned what he was finding in terms of the field was that the killer app that could very well be out there would produce cost. We heard several times that return on investment is something that small businesses cite very frequently. I think that in terms of -- take it off more here. If you look at return on investment you're also dealing with a FUD factor. Fear, uncertainty and doubt. But I'd like to draw in analogy is that is no different between small businesses and the large businesses. To that effect what I would offer up is that in order to reduce costs you would see an uptake in terms of investment, in terms of innovation.

I would offer up that the suppliers here around the table would certainly step up in terms of helping kick start the economy come up with new applications. But I think again you have to start with the most fundamental one. I don't see the difference being all that different between a small business in terms of driving the cost as well as the large businesses, be it service providers, be it suppliers, whatever. To me there is an analogy and in fact that may be the killer app --

DR. MULARIE: Bruce Josten says something that has really struck me. Maybe I'm reading it wrong Bruce but you said that companies that had broadband access their major concern is security. Companies that didn't have broadband are associated with ROI. Does that mean that fundamentally the people who have the broadband have satisfied the ROI?

MR. JOSTEN: Or have convinced themselves they have.

SECRETARY BOND: Let me turn to Assistant Secretary Mehlman for logistic points and see if I can try to wrap this up.

SECRETARY MEHLMAN: Thanks. I'll leave it to you Phil to thank folks and propose next steps. Two basic logistic points. First we've had

some folks volunteer, which I think would be great, to offer further written contributions. A lot of people have made reference to poll data.

One thing that I would propose that we do is for those who want to provide valuable reading material, a lot of surveys and polls, we will be happy to host links if folks want to send us URLs. It's good reading material. So if you want to send us URLs we'll post those in a way that folks who come to our website can find educational materials.

We will get the transcript and send that around to everybody to give you all a chance to make sure you were being quoted for what you said you were being quoted for. Also, if folks could remember to please give the stenographer a business card, it will help the organization of that effort.

SECRETARY BOND: Thanks Bruce. Let me take a shot here of seeing if I can summarize most of what we touched on today. Then see if we have some participants in a separate gap going forward.

It seems to me that there are two reasons to really advocate or be an enthusiast about broadband and they are productivity and quality of life. I think often we talk, at least

in the technology sector and industries therein, about these things as a means to deployment because deployment means they are going to buy our products and services rather than deployment as a means to productivity and to the flip side of that coin which is higher quality of life for Americans that comes out of increased productivity.

Indeed quality of life the grandparent checking in might be the killer app in this space but the focus here today has been on productivity. We talk about broadband deployment for the nation's sake for increased productivity rather than the sector's sake for increased sales. I think that we can summarize and say that we have heard about a real cultural challenge that comes to bear on the small and medium size enterprises.

We have some of the world's leading eCompanies here who really are pushing the envelope. But the challenge comes to get to those smaller and medium sized businesses. Therein there is a huge digital opportunity for America. There is a huge opportunity in the big companies who are pushing the envelope and finding more savings but the real gold mine is in small and medium sized enterprises if we were to realize a real productivity surge there.

Toward that end I think there are some

roles for each of us to play. As I mentioned the leading eBusinesses continue to lead the way, pave the way, push the envelope, for new applications, the grid computing that Chris mentioned.

Government as was pointed out can be a better example of capabilities of broadband and could certainly start by just finding out what our own capabilities are. Thanks for that Chris.

I'm proud to say that this budget and this Administration has been focused on trying to get more serious about IT procurement, deployment and actual strategy, with the President making eGovernment one of his five top initiatives for the Administration. So there is a role for government on the deployment there in being an example.

There's clearly a role for local leadership in creativity as was mentioned by Stagg in particular. Whether it's incentives or creative approaches like we see in Michigan, ways to use the local leadership to stimulate this and again not for the sake of the industry and sales but for the sake of overall productivity.

The area that some folks touched on that I would like to follow-up on is this possibility of partnership for us whether it's through associations as Marilyn referred to or whether it's directly with some of the companies

but finding ways to really take this message out, the value proposition out to communities and through institutions like NFIB and the Chamber to reach the small and medium sized businesses with a real value proposition and message of productivity, overcome the FUD factor by bringing some of the leading experts face to face with folks. That's the challenge I would like to end on to hear back perhaps from the associations represented here or companies represented here who would want to be a part a follow-up meeting to really try to plot out some plans and efforts to take this message out through various venues and through existing institutions to really reach the gold mine and try to hasten the day a little bit when we realize that upsurge in productivity. As somebody pointed out, it is coming and the question is whether we are going to be in the leadership position or somewhere in the top 20 instead of the very top.

I want to end on issuing that challenge and committing the Commerce Department to be willing to be a partner in that and helping to spread the word with the help of leaders in the private sector, recognizing the point that you don't usually look to the government as the center of innovation. But we do have the power to convene and we are believers in the productivity imperative

here and the fact that it can really benefit the quality of life of Americans, which is the purpose of our government.

Let me end on that. Let me ask if Kathy Cooper has any closing comments.

SECRETARY COOPER: I think you have said it all and said it well.

SECRETARY BOND: I don't know about that. Let me finish then with perhaps the most important part, which is to say, “thank you” to all of you. Some really stimulating conversation and insightful data points have been collected and we could not have done this without you and without your willingness to be here, to fly in, in some cases and so forth. We look forward to continuing to partner with all of you. Thank you very much.

(Whereupon, the above-entitled matter was concluded at 12:09 p.m.)