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GLOBAL BROADBAND CONNECTS AMERICA AND THE WORLD:
INFRASTRUCTURE, SERVICES AND APPLICATIONS

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

2 (9:35 a.m.)

3 MS. DE LA TORRE: Good morning. Welcome
4 to our Global Broadband Connects America and the
5 World: Infrastructure, Services, and Applications
6 Workshop. I'd like to welcome everybody. Thank
7 you for -- our speakers for coming today. I know
8 it was sort of relatively short notice, but we do
9 appreciate everybody showing up today. And
10 welcome to those of you who are on the webcast as
11 well. We can't see you, but I think you can see
12 us.

13 And we're really looking forward to
14 today's workshop. I think that it's going to
15 explore some new areas for our Broadband Task
16 Force and some of the efforts that we have here at
17 the FCC. And just by a way of background, let me
18 explain that this is the FCC's second workshop on
19 international issues, actually.

20 The first workshop was held on August
21 18th and that one was basically focusing on
22 lessons learned from other countries and so. And

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1 we looked at a lot of the Broadband Plans around
2 the world, what had worked, what hadn't worked,
3 and so they used some of that information. And so
4 Anurag and his team actually used that information
5 to develop some of the Broadband Plan itself and
6 they also traveled to, I think, at least seven
7 countries. Right?

8 MR. LAL: Right.

9 MS. DE LA TORRE: To go around and
10 follow up on some of the information that they had
11 gotten there. And so this workshop, itself, is a
12 little different. What we're looking at here is a
13 different perspective. We're sort of focusing on
14 global connectivity instead. And so we're
15 specifically looking at communication services
16 that the FCC licenses and how these services
17 enable global broadband. So it's a bit of a
18 difference here.

19 And as many of you know, the FCC
20 licenses satellite services; we licensed the
21 undersea cables as well, and long distance, et
22 cetera. And so a lot of these actually provide

1 broadband services now for Americans. I mean, it
2 used to provide just connectivity, but now it's
3 actually very important to broadband around the
4 world.

5 And you know, I think about it, when I
6 grew up overseas and, you know, when we -- when --
7 obviously if you look at me you can see that it
8 was way before Internet and way before cell
9 phones, but, you know, basically we had a single
10 wireline phone into the home, and that was if you
11 were lucky. And in some places where I lived, you
12 actually had to buy -- you either lived in a place
13 that already had a phone because it took two years
14 to get a phone -- I think Jackie had similar
15 experiences in her life as well. And so you know,
16 if you didn't get a place that already had a phone
17 then you were -- you know, you didn't get a phone
18 for a couple of years.

19 Now, of course, you know, things have
20 changed, of course. And I think the Brazilians
21 would be unhappy if I didn't explain that, you
22 know, that it has changed, in fact. But, you

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1 know, it was a really big deal to talk back to
2 your family in the United States. It cost a lot
3 of money, it was very unreliable, and so, you
4 know, I think that it was -- it's -- things have
5 changed now.

6 Now, I talk to my friends in Brazil and
7 around the world, you know, through voiceover
8 Internet protocol connectivity and I can do that
9 for free, basically the call is free. And so I
10 think that we look at some of the dramatic changes
11 that have happened in the last 20 years, and some
12 of us have been in telecom for 20 years and we've
13 seen that. And a lot of the steps have been --
14 the United States and overseas, as well, through
15 government, you know, leadership, as well as
16 through the innovative practices of the industry
17 and, you know, some of the new consumer offerings,
18 I think, that are being offered around the world.

19 Telephone, you know, is much more
20 accessible. In 1990, if we look at some of the
21 charges if you were calling to let's say a family
22 member in Italy, you're -- the termination rate

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1 would have been about 90 cents and now the
2 termination rate's about 5 cents. So you can see
3 that, you know, it's a huge difference. And of
4 course, it makes a big difference for consumers.

5 Now, this leads me actually to the
6 purpose of today's workshop. We have -- it's
7 basically to encourage a wider deployment of
8 broadband in the United States and overseas, and
9 also to facilitate what we're calling universal
10 connectivity, and thereby bringing the benefits of
11 a global mobile and digital world to people here
12 in the United States and all over the world.

13 You know, I've never been to a country
14 or worked in a country actually that access to
15 some level of telecommunications was not one of
16 the primary policy goals of the country. And I
17 think that, you know, we here are taking that a
18 step further.

19 We're now looking to bring some of the
20 global connectivity and that broadband to places
21 that have been remote and basically inaccessible
22 before. So now we're looking to sort of promote

1 that kind of thing. And we'll hear some examples
2 from our speakers in both of our panels about some
3 of the technologies that are being used and some
4 of the applications that are being used for this
5 global connectivity. And we'll also hear about,
6 you know, how those benefit Americans and people
7 around the world, and we'll see some specific
8 applications of that in the second panel.

9 Now, at the FCC, obviously, we realize
10 that broadband and connectivity has no boundaries.
11 I mean, it doesn't stop at the U.S. border and
12 then continue on somewhere else. We basically,
13 you know, it's -- information is located all over
14 the world and, you know, users of that information
15 also move.

16 They, you know, they may start in the
17 United States, they may end somewhere else, or
18 they may just stay here and just call other
19 places. So it's very important that they have
20 that broadband and universal connectivity and, you
21 know, to receive the information around the world.

22 And of course, the opposite is, you

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1 know, is true. As a person who travels a lot, I
2 can tell you it's very important for me to have
3 that connectivity back home and sometimes that
4 doesn't quite exist as much as I'd like it to
5 have. And as we know, the Internet has made a
6 huge difference in people's lives and it'll
7 continue to do so, I think, and, you know, have
8 enormous impact on the world.

9 But there are still some inequities that
10 exist and, you know, maybe Valerie D'Costa will
11 mention some of those. But I know that we were
12 looking at some statistics before this and
13 according to a study by Eurostat, in the 27
14 European Union countries, 1 out of 2 people
15 accesses the Internet, over 75 percent of people
16 access that.

17 And then -- oh, wait a minute; let me
18 get that right. One in two people access the
19 Internet every, you know, every day. If you're
20 over -- if you're between the ages of 16 and 24,
21 which I have two in that age limit, they do it 75
22 percent of the time. Now my 17- and 20-year-olds

1 actually access it on a daily basis, so 100
2 percent of the time. So I can imagine that other
3 people do the same thing.

4 And in the United States we actually
5 have -- we're at 74 percent of our population
6 actually have access to Internet. And then
7 somebody this morning sent me a very startling
8 statistic. I don't even know, really, what it
9 means because it's just huge numbers for me. But
10 it's from the University of California at San
11 Diego where they said that U.S. households
12 consumed approximately 3.6 zettabytes of
13 information in 2008. And I guess 1 zettabyte is 1
14 billion trillion bytes; sounds like a lot of data
15 to me.

16 But in developing countries, on the
17 other hand, the World Bank has some statistics.
18 And if you wanted to access -- have access to
19 Internet -- and it costs about 20 percent of the
20 average person's salary in those countries.
21 That's a lot. You know, I mean, we think about it
22 here and it's so ubiquitous and cheap, but in

1 other countries it's not that way.

2 So we're looking at some of these global
3 aspects for our Broadband Plan. And we'll be
4 looking today at some of the applications. We'll
5 be looking at, you know, you'll hear things about
6 defense and about disaster warning, and emergency
7 response, and health and medicine.

8 We have some very interesting speakers
9 on these issues, as well as education. And we'll
10 hear some of the challenges, I'm sure, from the
11 panel that's coming up. And I want to make it
12 very clear that we're here to learn. We -- you
13 know, this is a chance for you all to inform us,
14 to let us know, you know, how it is that you can
15 help and shape those global aspects of the
16 National Broadband Plan.

17 We want to hear your thoughts, we want
18 to hear your lessons learned, what you see as
19 innovative technologies coming up, what you see
20 as, you know, sort of coming down the pipe for us
21 to know, and, you know, what your ideas and
22 visions are. We're very interested in that and so

1 we're sort of in listening mode. We're little
2 sponges up here, sort of listening. We've got
3 people taking notes.

4 We also have people in the audience who
5 will be taking questions on cards. So anybody who
6 has a question, we have Carrie Lee back there who
7 will be glad to give you a card and then we'll
8 bring them up. And then people who are on the
9 webcast can also send their questions in and we
10 will ask those of the panelists and that kind of
11 thing.

12 So now it's my pleasure to turn the
13 microphone over to Anurag Lal and he's one of our
14 esteemed members of the Broadband Task Force who's
15 -- I don't think has been getting very much rest
16 lately and he's one of the ones who has been going
17 around the world and talking to different
18 countries. So I'll let him give you a little bit
19 of his experience now.

20 MR. LAL: Right. Thanks, Mindel.
21 Firstly, good morning, everybody; welcome to the
22 panelists. We really appreciate you all taking

1 the time today and help us in this process that we
2 are going through. I'd also like to welcome the
3 members of the audience, as well as the folks who
4 are following along with us on the Internet.

5 As Mindel mentioned, this is our second
6 workshop around international issues with a
7 slightly different perspective this time around.
8 But these workshops -- about 35, 36 workshops in
9 all -- that the Task Force has put together on
10 various different issues, is a means for -- by
11 which we want to make sure we have an opportunity
12 to hear, learn, understand from everybody, from
13 the industry, from the public, and in recognizing,
14 as also Mindel mentioned, recognizing that the
15 global Internet is not a U.S. only phenomena.

16 We are spending a fair amount of time
17 understanding the international perspective. The
18 international perspective is twofold. One, there
19 are a bunch of countries, about 22 countries in
20 all, that have invested in National Broadband
21 Plans. So there are a lot of countries that have
22 gone out and experienced and have experience in

1 pulling these plans together, executing these
2 plans, and delivering services to their
3 population. And so we want to be able to learn
4 from those experiences. We recognize that we may
5 not have all of the answers and other people may
6 have innovated in ways that could impact what we
7 are trying to do over here. And so that's really
8 the work stream that I'm managing as part of the
9 National Broadband Task Force.

10 Also helping me as part of the -- are a
11 bunch of folks, including one colleague of mine
12 who is here, who I'll take a minute to introduce,
13 Jordan Husted, sitting back there. Jordan, do you
14 want to raise your hand? There you go. Jordan is
15 another gentleman who hasn't had much sleep of
16 late and so I wanted to recognize that fact. But
17 we have had an opportunity to not only visit
18 countries, but also meet with folks on -- across
19 the globe and bring that perspective -- and see
20 how that perspective impacts us here in the United
21 States.

22 The second piece, which is the piece

1 that we're focusing on today, is also recognition
2 for an end user, a positive end user, experience,
3 a positive broadband end user experience here in
4 the United States. There is implications on how
5 the global ecosystem is pulled together and put
6 together. And a huge part of that global
7 ecosystem consists of facilities, whether those be
8 satellite, undersea cable, or hosting facilities
9 because we recognize that information that people
10 here in the United States are getting access, or
11 trying to gain access to, resides in data centers
12 on a global basis. They're looking for
13 information, they're looking for content, they're
14 looking for media.

15 And even if we provide exceptional
16 network here in the United States, there are
17 implications of how that media is transported and
18 that is the implication we are trying to come to
19 terms with during the course of this workshop.

20 So again, I look forward to
21 understanding the experiences and perspectives of
22 our panelists today and see how that is relevant

1 to what we're trying to do as part of the Task
2 Force as we build our plan.

3 And I look forward to participating with
4 the panelists, as well as with the audience, to
5 try and extract the most from this opportunity
6 that we have in front of us. With that, I'll hand
7 it back to Mindel and request her to introduce our
8 speakers and get started with the workshop.
9 Mindel.

10 MS. DE LA TORRE: Okay, thank you,
11 Anurag. All right. So I'll just do some brief
12 introductions, and I think the actual bios are on
13 the website, so if anybody wants a more detailed
14 version. And I'll just go ahead and introduce
15 everybody at one time so that you can have an idea
16 of who else will be on the panel.

17 First we have Diane Cornell, who is not
18 a -- she's not new to the FCC. In fact, we worked
19 together many years ago here at the FCC and so we
20 welcome her. She is the vice president for
21 government affairs, Inmarsat, and so we'll hear
22 that perspective from here.

1 And then Steve Corda, who is vice
2 president of market development for SES World
3 Skies and within North America, and so welcome,
4 Steve. And then Jackie Ruff, who is vice
5 president for international public policy at
6 Verizon and Verizon Communications I should say.
7 And she's been -- she's also another one of the
8 esteemed alumni from the International Bureau.

9 And then we have Nils Rix from -- let's
10 see, I have to find my little thing here -- from
11 Ericsson and he's a VP for strategy and marketing,
12 and the chief technology officer. And so we
13 appreciate you coming down for that.

14 And then we have Valerie D'Costa, who is
15 the program manager for the infoDev Program, which
16 works out of the World Bank. And she has a global
17 perspective for everybody that'll be very
18 interesting. And we used to work together when
19 she was at IDA; also a regulator in Singapore.

20 So we welcome everybody and thank you
21 for taking time out of your days to come here and
22 spend time with us. And we're very interested in

1 listening to your perspective. You'll each have
2 about five minutes to make your presentation. I
3 understand some of you have -- we'll make sure --
4 yes, we have Diane's presentation on the thing
5 now, so Diane, you can take it away, please.

6 MS. CORNELL: Okay. Thank you very much
7 and thank you for having this workshop. I think
8 it's very important to focus on global
9 connectivity as a different aspect of the
10 international issue.

11 I think as a driver for economic
12 productivity it's extremely important and I think
13 many of us in the industry are very happy to see
14 this workshop happen and see this focus. So
15 that's terrific. Let's see if I can actually --
16 so are they -- okay. I guess it's -- we're going
17 to do it. Okay, good.

18 So I'm going to spend a few minutes on
19 our mobile broadband satellite-delivered network.
20 Inmarsat is the most experienced broadband mobile
21 satellite provider. We've been around for 30
22 years. We've had a broadband network up for about

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1 two or three years.

2 We've had -- we have three satellites.
3 The fourth generation satellites that are
4 referenced on the slide are the satellites that
5 are used to provide our broadband service and I'll
6 talk a little bit about -- more about that in a
7 minute. And the three of them cover -- completely
8 cover the globe. So I think in terms of global
9 connectivity that's basically the consolation you
10 need for geostationary network.

11 We do have the ability to move hotspots
12 around, to move power capacity around, as it's
13 true with all satellite providers, to be able to
14 concentrate capacity in an area if there's a
15 particular need. So I think that's an important
16 factor.

17 The next slide just simply shows our
18 global footprint and I think illustrates the, you
19 know, the spot beams as well. Essentially, it's
20 like cell sites in the sky the way I think of it.

21 So this is sort of a very simple
22 schematic of how our broadband service works. We

1 have the ability to provide symmetrical speeds up
2 and down at about DSL speeds and it can be done on
3 a mobile basis. So it can be mounted on top of an
4 ambulance or a vehicle of some kind and, you know,
5 provide full connectivity for broadband service
6 while moving.

7 We have the ability to do a WiFi-type
8 back link, bubble, that people can use. And the
9 important thing is that it's a very small compact
10 device about the size of a laptop, which can be --
11 that is actually the antenna. That's what you use
12 to set up and that's it. So that's the mobile
13 device that the user accesses.

14 The main point I wanted to make on this
15 next slide is just to emphasize that we provide
16 broadband connectivity on sea, on land, and in the
17 air. For example, for media companies like CNN or
18 NBC, or companies who are providing live coverage
19 of breaking events overseas, they can have video
20 streaming capability from a beacon unit anywhere
21 in the world.

22 We also provide in-air passenger

1 connectivity services; not available yet in the
2 United States, but it is available in 72 countries
3 overseas and about 2 million passengers fly using
4 mobile service that's backhauled by Inmarsat
5 system on a monthly basis.

6 This is something that's very important
7 to critical enterprise and military government
8 customers. I won't go through it, but basically
9 relief agencies, U.S. Government, and other
10 governments overseas, medias I just described, and
11 critical infrastructure, which I think is very
12 important for -- in terms of productivity for some
13 of the issues that we talked about. And this next
14 slide just simply talks about -- some pictorial
15 images to capture that thought.

16 So just to -- by way of summary, I won't
17 go through the points that I've already made, but
18 it is available everywhere in the world and it's
19 with the big advantage of satellite. The one
20 point I did want to emphasis in this slide is that
21 it's a single user interface anywhere in the
22 world. You can set up your laptop whether you're

1 in China, or Peru, and you get exactly the same
2 user experience. So it's very important from the
3 user perspective.

4 In terms of applications, I think it's
5 one of the benefits of a mobile
6 satellite-delivered solution is it can support
7 public safety or disaster relief in not only
8 providing communications when the network fails,
9 but also for cellular or other kinds of
10 terrestrial infrastructure that's down by
11 providing picocell backhaul capability.

12 Telemedicine; you can mount a terminal
13 on top of an ambulance and it can provide
14 diagnostic data going back to a hospital or other
15 center, life-saving type of applications. And the
16 national security defense and the critical
17 infrastructure I think are fairly obvious.

18 So -- and just to conclude with some of
19 the challenges that I think we in the mobile
20 satellite sector and generally in satellite -- the
21 context face is -- the real problem, needless to
22 say is spectrum. We have the same issues that

1 have been identified in other wireless context
2 except ours is a little different. And that is
3 that we have to have minimum regional and ideally
4 global harmonized spectrum.

5 In other words, if we have a different
6 spectrum from one country to the next, our
7 services are not economically viable. And all of
8 our footprints cover multiple countries. And
9 without having access to consistent spectrum in
10 different countries, which is very hard, we have
11 to coordinate our spectrum every year with
12 operators in our assigned spectrum bands.

13 The other piece is having a predictable
14 regulatory framework, something that's stable
15 enough and understandable enough to be able to
16 make the capital investment that satellite
17 operators need to make. And that's a very hard
18 thing.

19 It's an issue that other countries --
20 excuse me, other sectors, telecom sectors, face,
21 but I think it's a bit unique in the satellite
22 world because each of our systems are somewhat

1 unique and face different challenges in different
2 regulatory environments and in different
3 countries. For example, some countries, like
4 India, require an infrastructure gateway that is
5 very important. So I -- important as a barrier
6 and something that needs to be addressed.

7 High fees are always a problem. I won't
8 get into that, but ultimately, the point that I
9 think is true for satellite operators overall is
10 that we need to have enough capital to be able to
11 make the investment, our satellites, and we have
12 to do it up front, well before we get any revenues
13 flowing from any services.

14 So I will leave it at that and turn it
15 over to the next speaker.

16 MS. DE LA TORRE: Thank you, Diane.
17 Steve, would you like to make a presentation?

18 MR. CORDA: Okay. Well, thank you for
19 the introduction and opportunity to be on the
20 panel. I'm going to get to the material on the
21 slides in a moment, but first what I'd like to do
22 is focus on the middle mile and, specifically, in

1 two different venues. One is within the U.S.
2 regionally focused systems and then I'll get into
3 high- capacity systems that are on the drawing
4 boards or soon to be in operation that are global
5 in nature. And I'll specifically be talking about
6 O3B, which is the presentation behind me, and O3B,
7 which is the other 3 billion people that aren't
8 connected to the Internet today.

9 So regarding the current regionally
10 focused systems, I'd like to reference the
11 comments that the Satellite Industry Association
12 provided to the Commission in response to their
13 October 8 public notice regarding middle and
14 second mile broadband connectivity.

15 As many of you probably are aware, the
16 SIA is a U.S.-based trade association providing
17 worldwide representation of the leading satellite
18 operators, service providers, manufacturers,
19 launch service providers, remote sensing
20 operators, and ground equipment suppliers. My
21 company, SES, along with Inmarsat, are 2 of the 16
22 companies that are executive members of the SIA.

1 In our comments we discussed how
2 satellite networks can and will continue to play
3 an important role in providing transport to the
4 Internet backbone efficiently and on a distance
5 and sensitive basis, and that the ubiquity and
6 cost- effectiveness of satellite provide a
7 connectivity to the Internet backbone are key
8 capabilities, specifically in the rural unserved
9 and underserved areas. In other words, these
10 types of locations that satellite service are
11 ideally situated to serve and, indeed, we are
12 serving them today by providing middle --
13 connectivity to virtually every location within
14 the U.S.

15 The broad footprints of geostationary
16 satellites make them particularly well-suited for
17 establishing connectivity from user networks in
18 areas where terrestrial infrastructure is limited.
19 Deploying a single earth station antenna at a
20 broadband user network's aggregation point is all
21 that is required to initiate satellite service,
22 allowing transport of traffic to the Internet

1 gateway anywhere within a satellite's footprint
2 regardless of intervening distance. In other
3 words, it's distance insensitive.

4 A temporary fixed-ground terminal can be
5 installed within days, in many cases within hours,
6 and provides temporary service so that it gives
7 time to go through the licensing procedures to get
8 a fixed-satellite service up and running. Our --
9 member companies today provide transport linking
10 remote ISP's and communities, including Native
11 American tribes, Alaskan villages, and other
12 isolated user networks to the Internet backbone.
13 So that's what we do today.

14 In short, by using these satellites, an
15 Internet backbone connection can be established to
16 a user network anywhere in the U.S. regardless of
17 the availability of -- capability. The transport
18 can be initiated quickly, and cost effectively,
19 and it can be adjusted in scale to meet the user's
20 needs.

21 Now satellite networks not only have the
22 advantage of ubiquitous coverage, they also have a

1 cost structure that makes them very viable for
2 connections to the backbone from these rural and
3 underserved areas. The underlying costs of the
4 satellite link, as I mentioned before, is fixed
5 because it is a very distance and sensitive type
6 of a service. So again, anywhere can get
7 connected to anywhere and it allows those
8 underserved areas to have quick access.

9 Now, in terms of economics, satellite
10 service today is very economical. It will provide
11 even more economic benefit and become more
12 economical as the technology advances within our
13 field continue to drive the cost of equipment and
14 service down. So there is a very good cost
15 structure today with traditional C and KU band
16 systems, but the upcoming KA band systems will
17 lower those costs significantly, in some cases by
18 an order of magnitude.

19 So if I could sum it up, what I would
20 say is the industry -- we look at broadband
21 connectivity not as terrestrial or satellite, but
22 more as terrestrial and satellite. They're very

1 complementary. They both have their capabilities,
2 their advantages, and I think it's up to us as an
3 industry to look for the areas where satellite can
4 best be served.

5 So now what I'd like to do is sort of
6 shift gears and talk about the future and one of
7 the future systems, which is, again, called O3B,
8 the other 3 billion people. And that's
9 approximately the number of people in the world
10 that aren't connected to broadband today. And a
11 main reason why they don't have that connectivity,
12 they don't have broadband, is that they don't have
13 the middle mile infrastructure. There's -- as all
14 of us know, the cost structures of the last mile,
15 specifically YMAX, LTE, and some of those emerging
16 technologies, is getting lower and lower. And so
17 that's not necessarily the issue, the bottleneck.

18 And on the other hand, high-capacity
19 fiber links are readily available throughout the
20 world right now and especially in the coastal
21 areas, like in Africa and such. So we have the
22 two ends and what we need to do now is connect the

1 two ends together.

2 And so if you could go to the first
3 slide, please. Oh, I'm sorry; I'm doing it.

4 Okay. So this is just a quick overview
5 of the network. It's eight mid-Earth orbit
6 satellites. They orbit about 5,000 miles and
7 revolve around the Earth about once every 5 hours.
8 We will be having eight satellites launched
9 initially; only five are needed to be able to
10 provide global coverage. And these additional
11 satellites that will allow us to have additional
12 redundancy and capacity and then we'll increase
13 the number of satellites in time to increase the
14 capacity as the needs develop. There is about
15 seven to nine gateways that we'll establish around
16 the world that will provide the connectivity then
17 into the Internet.

18 Now, excuse me, the interesting thing
19 about the satellites is that they have these
20 steerable beams that are moving; very different
21 from geostationary satellites. They're moving
22 across the globe and so we have to have beams that

1 are going to be able to track the locations on the
2 Earth.

3 And then, on the other hand, we're going
4 to need terminals on the Earth that are going to
5 be tracking the satellites. So there is a little
6 bit of complexity in the system, but clearly, it's
7 complexity that can be handled with today's
8 technology. And they are high-capacity. Each
9 satellite will have a capability of about 10
10 gigabits per second.

11 Now just to kind of put in perspective
12 where everything is, these are in the mid-Earth
13 orbit, again, 5,000 miles in altitude, so it's
14 approximately a fifth of the way between the Earth
15 and the geostationary belt. And there's two major
16 applications that are served by O3B. One will be
17 point-to-point high-capacity connections. And
18 instead of going through this in detail, we can
19 get into it if there are any questions, but this
20 whole really high-capacity trunking in the gigabit
21 per second range from, again, an Internet location
22 to a remote area.

1 The second application that we envision
2 is more of a point-to-multipoint and this is --
3 would be for backhauling, again, the wireless
4 services and such out to the rural areas. And the
5 bandwidth in this case would be more on the order
6 of about 10 megabits per second that would be
7 carried over this link.

8 Now what I'd like to do is just quickly
9 show you what this would look like in orbits; we
10 have a simulation here. There you go; so to kind
11 of put it in perspective. So this is actually 16
12 satellites, so this would be a little fuller
13 constellation.

14 And as I mentioned, it's interconnecting
15 points, like the location in Spain, to different
16 remote locations. And you can see as the
17 satellites progress around the Earth, they need to
18 switch from location to location and,
19 subsequently, each of the terminals also will be
20 switching from location to location. And each of
21 the spot beams are on the -- of about 500
22 kilometers in size. So it covers a fairly large

1 area, okay.

2 So that concludes my introduction and I
3 really look forward to a very interesting
4 discussion.

5 MS. DE LA TORRE: Well, thank you very
6 much. Now we have Jackie Ruff from Verizon
7 Communications.

8 MS. RUFF: Let me see how this works.
9 Okay, great. Well, let me also say thank you for
10 doing this workshop. I think it is -- it focuses
11 on the very important issue of global
12 connectivity, which is at the heart of how our
13 economy works, how our citizens communicate, how
14 we all communicate, and having more robust, more
15 far-reaching usage of broadband will have an
16 enormous multiplier effect for the digital
17 economy.

18 So there are just some statistics here
19 that give us a bit of a context for then looking
20 at more detail on how we do things. So talking
21 from Verizon's perspective, we are a key player in
22 this aspect of the U.S. communications and

1 Internet services.

2 We have a global network, you'll see it
3 here on this diagram; that's it's status in early
4 2008. I say that only because there are some
5 names of systems on there and I want to make sure
6 that it's -- you see exactly when they are from.
7 So global network of almost 500,000 miles, which
8 includes capacity on numerous satellites, as well
9 as terrestrial cables, and then my focus today is
10 on the more than 80 undersea cables where we have
11 capacity.

12 This high-speed capacity for my network
13 is connected to 4,500 POPs, points of presence,
14 around the world that are Internet nodes, numerous
15 data centers, as we mentioned earlier, and it's a
16 significant part of the global Internet backbone.
17 So this is what enables us to provide global
18 connectivity to more than 100 million consumers,
19 most of them in the U.S., everyday, and voice and
20 data roaming as they travel around the world,
21 global services for businesses and government
22 agencies, and in more than 150 countries.

1 These services are evolving rapidly and
2 they're becoming more and more complex. So -- and
3 let me just move on here. So they're -- because
4 of the increasing demand for Internet, there are
5 more and more undersea cables being deployed. And
6 I want to talk about some of the ones that we've
7 been involved with.

8 As an example, in 2008, the Commission
9 licensed the TransPacific Express cable, which is
10 -- was the first Pacific system licensed since
11 2000. The original consortium owners of TPE were
12 Verizon and five operators from Korea, Taiwan, and
13 China. Phase 1 required a \$500 million investment
14 and the system went into service in September
15 2008. This system brought 60 times the existing
16 U.S.-China capability and this cable alone can
17 support the equivalent of 62 million simultaneous
18 calls.

19 Our current project, you'll also see on
20 this slide, is the Europe-India Gateway, EIG,
21 which will provide additional connectivity and
22 redundancy between India and the U.K. via the

1 Mediterranean. And I would note the regional
2 importance of this additional capacity and
3 resiliency when thinking about the Chairman's
4 recent visit to CENTCOM in Qatar. Probably most
5 historic in this area of undersea cables, at the
6 moment, is what's happening in Africa: The
7 first-ever cables along East Africa and additional
8 capacity for the underserved West Africa route.

9 So the benefits of this type of
10 international broadband are clear. It is meeting
11 the soaring increases in consumer use of the
12 global Internet as Cisco projects between 2008 and
13 2013. That demand is quintupling. And additional
14 benefits are, as we saw in China and the
15 U.S.-China route, but in others, are increasing
16 competition; also enhancing service quality for
17 customers with lower latency, faster provisioning,
18 and greater ability to manage Internet security.

19 So along those lines let me just -- I
20 know that the architectures were of interest for
21 this panel. The TransPacific Express also
22 improved resiliency and redundancy in two key

1 ways. First, it avoided some routes where there
2 are many cables and they're clustered. It avoided
3 transit through Japan and through the area where
4 the 2006 Taiwan earthquake cut seven cables.

5 Second, allowed Verizon to configure a
6 seven-way Pacific mesh network, which
7 significantly enhances the ability to do
8 restoration. And that's a diagram of that at the
9 bottom. We have that in the Atlantic; now we have
10 it in the Pacific; we're building it in the
11 Mediterranean with EIG.

12 So what are some of the public policy
13 issues associated with today's topic? As with
14 other types of broadband there are issues around
15 both deployment and adoption. And deployment
16 encompasses more than just the construction of the
17 wet link; it also requires the ability for all
18 providers to use the capacity on the entire route
19 without barriers to doing so, such as foreign
20 investment limits. And I can go into that in more
21 detail in the discussion, but essentially if you
22 have, say, a 49 percent limit on foreign

1 investment from Verizon's perspective, we are not
2 likely to actually get a license because we won't
3 be able to control it, which means we cannot use
4 the foreign end of the capacity. So in Korea
5 right now there's a 49 percent limit. We cannot
6 use a foreign end of the TransPacific Express
7 cable that lands in Korea. If we ever get the
8 free trade agreement implemented, that will go to
9 100 percent and we will be able to do that, which
10 enables better quality for our customers.

11 Deployment also requires pro-competitive
12 opportunities for diverse routes into a country
13 through multiple landing stations, for
14 interconnection within landing stations, and for
15 choice among backhaul providers within a country,
16 in addition to repair and maintenance of cable
17 systems; should be simple without cumbersome
18 approval processes.

19 On the adoption side, just a few words
20 about the type of services that we offer globally
21 to large enterprise and government entities.
22 Today we offer IT services, cloud computing,

1 sophisticated network security, services that help
2 reduce travel and other environmental impacts.
3 These help U.S. businesses be competitive globally
4 and we expect an even more positive impact as we
5 use broadband more in this country and elsewhere
6 for purposes like education, health care, and so
7 on. There are numerous public policy issues
8 around that.

9 Now, the Commission has been a leader
10 over the years in encouraging positive regulatory
11 environments to help ensure foreign market access
12 along these lines. In deciding where to invest in
13 expanding global broadband connectivity, we take
14 into account the foreign investments limits I
15 mentioned, the effectiveness of regulatory
16 practices, as Diane mentioned, and then the
17 opportunities to provide a wide range of converged
18 services and develop new business models.

19 So we hope the Commission will advance
20 points like that in its international work as it
21 has in the past through exchanges with
22 counterparts, through work in multilateral

1 organizations, and technical assistance to
2 non-U.S. Regulators. So we look forward to
3 working with you in that regard.

4 Thank you.

5 MS. DE LA TORRE: Thank you very much,
6 Jackie. And now we'll pass the microphone over to
7 Nils Rix from Ericsson.

8 MR. RIX: Thanks, Mindel. Yeah,
9 pleasure to be here. Thank you for the
10 invitation. I'd like to introduce Ericsson a
11 little bit for those of you that don't know it. I
12 mean, Ericsson is a global telecommunications
13 supplier and we provide primarily terrestrial
14 infrastructure for all of the telecommunications
15 operators around the world. We operate out of
16 over 170 countries and, therefore, we have a
17 pretty good perspective on what happens around the
18 globe with regards to communications,
19 telecommunications, broadband, particularly mobile
20 broadband.

21 So I'm going to quickly show you a few
22 charts that represent what we see coming going

1 forward with regards to mobile broadband. And
2 we're basically an inflection point today globally
3 with regards to the balance between fixed
4 broadband and mobile broadband.

5 So we're basically reaching about a
6 billion broadband subscribers around the globe.
7 And so the inflection point is that mobile
8 broadband connectivity will take over fixed
9 broadband connectivity.

10 And we believe that in 2014, we'll have
11 tenfold the mobile broadband connectivity that we
12 have as opposed to fixed broadband connectivity.
13 And so that obviously means that 80 percent of
14 broadband subscribers are going to be mobile in
15 2014, which I think is a key motor and
16 demonstrates the value of mobile broadband going
17 forward. And what it really means is it's
18 bringing the Internet content, media content,
19 globally beyond continental, regional, and country
20 boundaries to everyone on the globe.

21 And if you look at what drives that
22 traffic, I mean, it's largely driven by the kind

1 of device that the end user can use to basically
2 access that Internet or access that broadband
3 connection. And mobile phones, you know, have
4 relatively limited bandwidth today.

5 Smart phones expand that and, of course,
6 PCs expand that further. And the traffic that is
7 driven depends primarily on, for example, the size
8 of the device in terms of processing power, in
9 terms of display that the individual can use to
10 really access and consume that information.

11 And so what we see here is basically a
12 graph that shows exponential growth of traffic,
13 which is a challenge to manage, of course, for
14 those of you that provide networks with regards to
15 operational networks to the end users. But at the
16 same time, it's also, of course, the purpose of
17 what these networks are supposed to do because
18 without that traffic, we wouldn't get that
19 information across and wouldn't get the value
20 across those networks. So that's sort of the
21 challenge that we have to manage.

22 Now, when we look across the world and

1 look at what the barriers and boundaries are that
2 we have to overcome to bring broadband to
3 everyone, we see key -- two key dimensions. There
4 is one dimension that we have been working for --
5 working on for the past -- yeah, Ericsson has been
6 around for 100 years, on bringing communications
7 to everyone.

8 And so 20 years ago, we were still
9 talking about how do we bring more fixed telephony
10 to every individual. That has changed in the
11 '90s, where we have worked a lot of sort of
12 improving economics to bring more and more mobile
13 communications to the individuals. And that
14 challenge was to bring, with a good cost
15 structure, mobile communications to countries
16 where the average revenue per user spent, that the
17 individual could afford, was very, very low. So
18 we've managed it very well. I mean, all emerging
19 countries today -- and reasonably good developed
20 and mobile networks.

21 Now, the next step obviously is breaking
22 those frontiers to bringing mobile broadband into

1 everybody's home and into everybody's consumer
2 space. And in addition to that, also breaking the
3 frontiers with regards to bringing connectivity
4 with another step in cost optimization that
5 technology can provide to areas where you don't
6 have any infrastructure.

7 We don't have an electricity grid, we
8 don't have a transmission grid, but the economic
9 benefits and the social benefits are so dramatic,
10 for example, in Central Africa and the Amazon
11 jungle to give you two examples, that, you know,
12 we're actually capable today to do that and I can
13 give you a few examples on how we do that. So in
14 addition to that, bringing broadband to the
15 subscribers, we have, of course, a value -- that
16 we provide with regards to bringing more
17 information and more economic value to the
18 individual. So these two dimensions are basically
19 sort of the key dimensions that we work on.

20 Then last, but not least, I mean, as I
21 already mentioned, we're moving from a one
22 vertical or one segment application, which is

1 primarily voice communication, to a multivertical
2 segmentation. So this inflection point, where we
3 are today, where mobile broadband takes over sort
4 of the number of subscriptions with regards to
5 fixed broadband and -- to everyone that can
6 basically have a mobile phone, means that we
7 really have a possibility to drive value out of
8 multiple segments that we can't address today:
9 Education, connected home, machine to machine.

10 I'm talking about the five M's: So it's
11 man, machine, it's meters, it's mobile vehicles,
12 and it's mansion, so homes. So those five
13 dimensions are really what we're basically
14 addressing.

15 And so with that, I want to conclude and
16 maybe talk a little bit about the challenges.

17 The challenges are very simple. I
18 think, from the economic constraints, we have to
19 basically find ways to deliver broadband and
20 communications to areas where there is no
21 infrastructure, where there are no resources, and
22 I think that is what we're here to discuss.

1 MS. DE LA TORRE: Thank you very much.
2 And now we'll move to Valerie D'Costa, please,
3 from infoDev.

4 MS. D'COSTA: Thanks very much, Mindel,
5 and thank you to you and your team for inviting
6 infoDev and the World Bank to share their
7 perspectives on this debate. I value very much
8 the invitation and hope that the points that I
9 want to make -- I didn't have the opportunity to
10 put slides together, but I'll enter some comments
11 to Mindel's office afterwards.

12 But I certainly was very heartened to
13 hear the reference to the importance of universal
14 connectivity, which Mindel referenced, and then
15 also this idea of a global ecosystem, which Anurag
16 spoke of. I want to perhaps put across a
17 perspective from the bank that this goes beyond
18 infrastructure.

19 And the way that we are looking at this
20 is in addition to the very useful points on
21 connecting the unconnected, serving rural and
22 remote areas, which is a critical mission of the

1 bank, it's also about the growth of markets. It's
2 also about serving an increasingly sophisticated
3 developing country user.

4 So I would like to just preface my
5 comments by saying our vista, our lens, is of
6 broadband as a tool for sustainable development.
7 And I want to widen the perspective a little bit
8 from just the notion of infrastructure
9 connectivity.

10 The World Bank and infoDev have
11 collaborated on a number of quite important
12 analytical tools last year as well as this year.
13 We -- and you'll see them being published in
14 pretty short order and we hope that you will find
15 those useful. Recent work includes broadband
16 infrastructure investment in stimulus packages
17 looking at the relevance of this as a policy
18 measure in developing countries. Also, "Building
19 Broadband," a seminal report on how broadband
20 should be looked at as a tool for sustainable
21 development.

22 Thirdly, infoDev is taking the lead to

1 construct a broadband strategies toolkit, which
2 will provide hands-on practical advice to
3 developing country policymakers, private sector,
4 and financiers on how to approach broadband in
5 their markets.

6 Additionally, we have done work on
7 broadband for Africa; looking at the development
8 of backbone networks, as well as the broader
9 economic impacts of broadband. Looking at our
10 broadband and stimulus package work we've realized
11 that there have been numerous broadband
12 initiatives in OECD countries, as well as here.
13 But this is equally relevant for developing
14 countries as part of their economic recovery plans
15 or overall strategic development plans.

16 Now, a recent World Bank study showed
17 that in addition -- showed that -- did an economic
18 -- econometric analysis of growth in 120 countries
19 between 1980 and 2006. The results show that for
20 every 10 percentage point increase in penetration
21 of broadband there's an increase in economic
22 growth overall of 1.3 percentage points.

1 I want to do a quick aside, even if this
2 takes up a little bit more time, to say that while
3 the Bank remains technology neutral, we see that
4 the explosive growth of the mobile platform is
5 something that we are seriously focusing in on.
6 That doesn't equate to us thinking only of mobile
7 broadband. However, the largest surge in growth
8 of mobile subscriptions is taking place in the
9 developing world and within the developing world
10 in Africa.

11 I just want to point that out because I
12 think, for our perspective, mobile systems,
13 networks, and services, and I'm sure Ericsson will
14 appreciate this, as will other vendors in the
15 room, it needs to be looked at as perhaps the
16 single largest, most pervasive delivery platform
17 for development services today. And that's really
18 sort of the thinking that's emerging within the
19 bank.

20 Now, just in the interest of time, I
21 realize I have to move on, but I want to talk
22 about the Building Broadband report, which you

1 will see issued shortly and which I will send
2 along to Mindel's office for further distribution.
3 Now, this report is going to distill for
4 policymakers and regulators different approaches,
5 strategies, policies, regulations that have been
6 found to be useful in higher income countries and
7 which could be useful tools to spur broadband
8 growth in developing countries.

9 We have looked at the state of broadband
10 and realize that by the middle of 2009, the number
11 of broadband subscriptions, both wired and
12 wireless, crossed the 967 million mark. This is
13 about 14 percent of the world's population. Of
14 course, as you know, the bulk of these connections
15 is in the developed world. And we found that low-
16 and middle-income countries have lagged behind
17 fairly significantly in take up; certainly the
18 lowest number was in Africa, where penetration now
19 is at around 2 percent.

20 This report, Building Broadband, is
21 going to make a proposition that we need to
22 reconceptualize broadband. And I'd like to leave

1 that as a notion for this audience as well. One
2 way to think of a traditionally held notion is
3 that broadband is a specific type of network. You
4 need to have connectivity at a minimum speed of
5 transmission.

6 Our report proposes that broadband is an
7 ecosystem which includes the network components,
8 the service components, applications, and the
9 behaviors and needs of developing country users.
10 This is a really critical point in the way we're
11 approaching these issues and we believe that each
12 one of these needs to have a sustained plan of
13 action. So the -- rethinking broadband is really
14 about looking at both supply side, but also demand
15 side dimensions of the market. And we believe
16 that it's a critical dimension to facilitate
17 demand, adoption, and uptake.

18 The report will propose broadband
19 building blocks. We've looked and surveyed seven
20 countries. They are Finland, France, Japan, the
21 Republic of Korea, Sweden, the U.S., and the
22 United Kingdom, to try to distill interesting

1 building blocks for developing countries to think
2 about as they approach the development of
3 broadband themselves.

4 And we think that these represent
5 basically good practice, but not binding
6 requirements and they need to be obviously
7 contextualized. These building blocks are, number
8 one, be visionary yet flexible.

9 Countries that create and devise
10 national broadband strategies tend to have more
11 cohesive frameworks within which to look at
12 individual policy pieces and regulations.
13 Strategies like this should not be static,
14 particularly for evolving markets. And we found
15 that as of 2009, every single one of the countries
16 that we surveyed had or is developing a national
17 broadband strategy.

18 The second building block: Promote
19 market competition and growth. The most
20 successful countries used collaborative approaches
21 between the public and private sectors. And one
22 area that we're going to deepen our work on is

1 what are innovative public private sector
2 partnerships for developing countries in broadband
3 uptake. We found that public investment aimed at
4 specific gaps or triggered -- working as triggers
5 for larger private sector investments have worked
6 quite well.

7 Thirdly, facilitate demand. We feel
8 that much of the activity in developing countries
9 on broadband is fairly supply led and we believe
10 that demand drivers really need to be harnessed at
11 this point of time, first of all, to raise
12 awareness, improve affordability, but also expand
13 uptake. So we notice that countries have used
14 strategies for network rollout, but also to
15 support research, manufacturing, promotion, user
16 awareness, ICT skills, and digital literacy. And
17 all of these blocks in a developing country
18 context are critical.

19 I'm going to do a 15-second plug to say
20 that next week infoDev, the Government of Finland,
21 and Nokia Networks -- Nokia Corporation will be
22 launching a program looking at stimulating demand

1 in developing countries using the mobile platform
2 as a tool for broadband uptake and growth. I'll
3 leave it there and I think for the broadband
4 toolkit, which I mentioned, perhaps just enter
5 comments on the record for you all to know about.

6 I've brought comments of -- copies of
7 our executive summary for -- of our seminal report
8 on ICD, Information and Communications for
9 Development, which you're all welcome to take, and
10 I'm happy to answer questions.

11 MS. DE LA TORRE: Thank you very much,
12 Valerie. I think that you're -- the 10 percent
13 increase in broadband and the effect on GDP has
14 been, in the last 5 weeks of my life traveling
15 around the world, that has been the single most
16 quoted fact. So I hope it's right because it has
17 been repeated around the world and many times,
18 actually, by our own Chairman, who really likes
19 that statistic. So thank you for coming up with
20 that and thank you for bringing that perspective.

21 I think we've heard now from all of the
22 speakers. It's been, you know, very interesting

1 getting the different perspectives. We've had the
2 satellite perspective, we've had the, you know,
3 the middle mile perspective, we've had the
4 undersea cable, and then also the vendor and the
5 mobile broadband perspective, as well as
6 Valerie's, which is, I think, a step back. So I
7 think that's given us a very good view.

8 And I just -- I wanted to start the
9 questions off with, you know, what do you see,
10 from your own perspective, will be the most
11 consumer -- that will benefit the consumer the
12 most from both the U.S. perspective, as well as
13 the foreign perspective? I mean, I can imagine,
14 Diane, that you would have something to say about
15 the -- proposal, but exactly how do you see that
16 as differing from where you were -- where we were
17 like three years ago?

18 MS. CORNELL: Well, I think that the
19 real issue here is trying to figure out what are
20 the obstacles in place -- or in the way of
21 consumers getting access to connectivity. I
22 think, as Steve said, you know, the pieces of the

1 network are there, but getting backhaul to remote
2 areas is something that I think is extremely
3 important to serve consumer needs.

4 A remote village in no matter what
5 country or no matter how remote they are can be
6 served via satellite and then have a local WiFi
7 bubble or something along those lines. I think
8 the important thing is to figure out a way to
9 deliver service, whether it's consumer,
10 government, enterprise, whatever, cost
11 effectively. And I think that is the real
12 challenge.

13 Raising capital in this environment is
14 extremely difficult. And I think in the --
15 whether it's in the United States or whether it's
16 overseas in other countries, I think the important
17 thing for policymakers to focus on is making sure
18 that the most cost-effective delivery mechanism is
19 enabled and not blocked.

20 And I think the problem is that there's
21 too much focus on, you know, trying to find the
22 best network available, the highest speed network

1 available, and not enough focus on trying to find
2 the most cost-effective network available that
3 will serve effectively to provide broadband.

4 SPEAKER: And just to follow up on that,
5 I appreciate that perspective, Diane. Valerie
6 talked about affordability and a lot of studies
7 have been done and we're looking within the Task
8 Force at -- and how to push not only supply side
9 efforts, but also demand side efforts. And the
10 panel here, all of you, bring a very unique
11 perspective of different technologies.

12 Again, the FCC obviously is technology
13 -- is agnostic, but what challenges are you facing
14 that are barriers for you or remain challenges in
15 making your services that much more affordable to
16 the end users? So we're going to at least check
17 that. And what trending are you seeing from a
18 pricing perspective in your -- each areas of
19 expertise? Please.

20 SPEAKER: Yeah. I think in the
21 satellite capacity area you don't typically see as
22 much a -- of a drop in cost structures as you have

1 in perhaps other technologies such as fiber and
2 terrestrial. At least heretofore that's been the
3 situation. Now with new technologies and
4 specifically KA band where we can reuse
5 frequencies and get essentially more bang for the
6 buck for that very expensive launch of the
7 satellite on to location is dramatically reducing
8 the cost structure that will then, of course, get
9 translated into reduced pricing at the consumer
10 level.

11 We did a study of looking at the demand
12 for consumer broadband in the U.S. and we took the
13 perspective of understanding, based on different
14 income groups, what the potential demand was and
15 the ability to pay and that sort of thing. And
16 it's -- once you look at the segmentation of the
17 market based on household income, it's very
18 dramatic and very predictable in terms of what the
19 actual take-up is. And so, you know, we believe
20 that it's largely driven, of course, by the cost
21 and so through things like the broadband stimulus,
22 you know, being able to reduce the upfront costs

1 by reducing the capital cost of developing the
2 systems.

3 So I think number one is clearly the new
4 technologies is providing advantage. The second
5 thing I would add is access to risk-oriented
6 capital I think is very important. These -- a lot
7 of the systems that are envisioned, they're very
8 capital intensive, they're for a very long period
9 of time. The satellites will be in orbit and --
10 over a 15-year basis and so that's a very, you
11 know, a very rigid structure to work into.

12 And in the past, of course, we've seen a
13 number of different, more speculative systems that
14 were proposed and invested and that didn't come to
15 fruition. But I think now it's -- the industry
16 itself is much more prudent in that sense. But I
17 think access to the capital to allow us to lower
18 those cost structures, and again, risk-oriented
19 capital to where, you know, we don't necessarily
20 have to provide an immediate return back to the
21 investors, I think that's key.

22 And then the last thing I would say is

1 continue to access to spectrums. Spectrum has
2 been always been the challenge for us in the
3 satellite industry. Globally it's even more so, I
4 think, in the U.S. There's a significant amount
5 for demand for new services in a lot of developing
6 areas, Latin America and in Africa, and we're very
7 hard pressed to get access to spectrum so that we
8 launch the systems to support them.

9 SPEAKER: Okay, a couple of thoughts
10 here. One is part of the costs, if you're looking
11 at service globally, obviously is in the global --
12 the international part of the infrastructure.
13 You've been talking about the satellites, but also
14 the cables and just the fundamental principle of
15 competition that I tried to illustrate, but that
16 is so important here.

17 It -- it's been -- to have competition
18 in a pro- investment public policy environment,
19 it's been very interesting. I read a report
20 recently on South Africa where already, because
21 there is now a cable going up East Africa as well
22 as West Africa, and amazing things have happened

1 in terms of costs dropping; both backhaul inside
2 the country, as well as the international piece
3 there. I mean, it was just that simple; get two
4 systems coming in and amazing things happen.

5 Second, I think the point about mobile
6 being the platform in the developing world is very
7 important. That's what is going to happen.
8 That's why I put the numbers up at the beginning
9 about how many more mobile subscribers there are.
10 So anything that can be done to try to figure how
11 to make that work, right. So whatever follows
12 from that.

13 Third, on the ecosystem and the
14 importance of focusing on the demand side, one
15 thing that's very striking to me is how many
16 countries still prohibit, according to the ITU, 49
17 still prohibit voiceover IP, 11 severely limited.
18 So there's an instance of something that consumers
19 could clearly benefit from, but that also would
20 drive demand that in turn would make things more
21 affordable.

22 And finally, from a consumer

1 perspective, this may seem obvious, but we haven't
2 really talked about it, issues that make them more
3 confident in using broadband. So privacy, cyber
4 security, all of those kinds of things, need to be
5 addressed. And I think that was a point in a
6 recent World Bank study, maybe even that one that
7 e-commerce would be used much more in the
8 developing world if we can really get a good
9 handle on those types of issues.

10 SPEAKER: Yeah, I would say that there
11 are two very connected but, from an execution
12 perspective, different kinds of dimensions that we
13 need to look at in order to really make this a
14 viable -- economically viable and demographically
15 viable economic broadband, mobile broadband,
16 economy going forward.

17 I mean, telecommunications and economy
18 of scale gain. So cost is highly related to
19 economy of scale, which means highly related to
20 adoption. The reason that why we have almost four
21 and a half billion mobile subscribers around the
22 globe today is because we have a very, very strong

1 standard that has been adopted around the globe,
2 which is called GSL.

3 And so standardization, as well as --
4 which fosters adoption, which fosters then in turn
5 economy of scale, has allowed us to move that
6 technology into even low cost environments.
7 Without that penetration, without that adoption,
8 we wouldn't have been able to do that.

9 The second I mention, which is, of
10 course, tightly related, is how do you create
11 demand. And so the demand for voice connectivity
12 has been there for many, many years. I mean, that
13 is what has driven the whole telephony industry.
14 But now we're basically extending that demand
15 beyond the sort of normal communications sector.
16 We're basically extending that into all dimensions
17 of life and to all dimensions of economy and
18 mobile broadband really is the vehicle to bring
19 that.

20 So the question is how do we basically
21 make sure that with the increasing demands on
22 bandwidth, which drives costs, we can actually

1 facilitate a cost structure that sort of creates a
2 motor for enhancing that demand into all sectors
3 of life? And I think that that combination is
4 what needs to drive the economy and that is, you
5 know, the engine for growth in that is what drives
6 capital into the sector.

7 SPEAKER: I actually wanted to shift
8 gears a little bit if I could and have Valerie
9 talk a little bit about her experience in her
10 previous life at the IDA. Singapore has early on
11 recognized the importance of broadband and to make
12 their economy more attractive have done some
13 interesting things that you may have an
14 interesting perspective on and I'd love to capture
15 that as well, Valerie.

16 MS. D'COSTA: It's interesting to me how
17 many times this question comes back to me. So I
18 have to hasten to add that I don't represent
19 Singapore and so have to maybe just put that out
20 there. I'm here for the World Bank. But I'm
21 happy to have a little bit more detailed
22 conversation offline.

1 I would just say this, you know, since I
2 left after years at the IDA, one of the strengths
3 perhaps of the country from which I come is the
4 willingness and ability to think of things
5 holistically. So it never really is just about
6 regulating Singapore telecom's price on this. It
7 isn't just about opening access to undersea cable
8 landing rights. It's considered as a -- an
9 ecosystem of issues relating to reinforcing and
10 building up Singapore's connectivity
11 competitiveness and connectedness to the rest of
12 the world from which the rest of our commerce and
13 livelihood flows.

14 So I would only add, I think, that
15 Singapore might offer some interesting dimensions
16 of -- or experiences from looking at broadband in
17 terms of facilitating public private partnerships.
18 The government has never really hesitated to use
19 funding in a stimulative capacity, but as always,
20 usually had a sunset clause at which point it
21 would pull out of public private infrastructure
22 initiatives and ensure that the private sector

1 runs with it.

2 So these are some broad points. I'm
3 very happy to talk more offline, but I'm just
4 conscious that I no longer work there. Things
5 move so fast there, as well. I have to catch up
6 myself.

7 MS. DE LA TORRE: Well, Valerie, going
8 back to your current job and the statistic that
9 you had mentioned, there was a question from the
10 audience actually asking when -- with that 10
11 percent increase in broadband penetration, the
12 number I think that you gave, which was a 1.3
13 percent, that deals with developed countries,
14 correct? And I think the question is what is that
15 for developing countries?

16 MS. D'COSTA: Yeah, thank you for that
17 question. It's -- to clarify, that was based on a
18 study of 120 countries, which looked at developed
19 middle-income as well as less developed countries.
20 So that is an aggregated number of 1.3 percentage
21 points across. You'll find more details here in
22 this report.

1 Now I think the next step that we're
2 going to try to do is basically to deepen the
3 economic impact analysis work for developing
4 countries. Of course the examples from which to
5 -- data are fairly few and so we really have to do
6 a little bit more comparative analysis at this
7 point of time. But that number that I gave you
8 was not just developed. That was a range of
9 countries.

10 MS. DE LA TORRE: Thank you very much.
11 And another question that we have here from the
12 audience is a question for Ericsson. And it says
13 what does Ericsson consider its best technologies
14 for backhaul, especially for rural and remote
15 areas in developing countries?

16 MR. RIX: I don't think there is one
17 answer. I think it depends on the situation. I
18 mean, we have a range of technologies at our
19 disposal from satellite technology through
20 microwave transmission technology through, you
21 know, copper and fiber technologies that are being
22 employed.

1 And depending on the situation,
2 depending on the remoteness of the area, you have
3 to use all of these technologies in order to come
4 to the best business case to solve that local
5 problem. To give you an example, if you're
6 somewhere in the middle of Russia or Siberia or
7 Africa, probably your -- both -- your best
8 long-range transmission option is the satellite
9 connection. I mean, that has been, you know,
10 shown in many, many countries. If you're in a
11 very developed area, like in a big city, say New
12 York or so, probably fiber is your best
13 transmission option.

14 So I don't think there is one answer. I
15 think at the end of the day there are technologies
16 that basically provide better cost points than
17 others, but that is also dependent on what the
18 existing infrastructure is. You always have to
19 look at this from an implemental investment
20 perspective, as opposed to sort of a new
21 investment perspective. So, I mean, that I think
22 drives that.

1 The challenge is, of course, that with
2 the new technologies that we're bringing to
3 market, particularly LTE and sort of, you know,
4 high bandwidth technologies, that the equation
5 needs to be looked at very closely in each
6 individual case because as I showed, the traffic
7 grows exponentially with the applications that
8 we're bringing to market.

9 So I would say probably long term if you
10 can afford it and if the infrastructure is in
11 place, fiber is probably your preferred
12 technology, at least for very high bandwidth, high
13 consumption areas.

14 MR. LAL: Great, thanks for that.
15 Again, shifting gears a little bit, I'm curious.
16 We've heard about opportunities around public
17 private partnerships and you also heard about a
18 lot of programs on a global basis that have worked
19 where public sector and private sector have come
20 together; whether that be on supply side or demand
21 side opportunities.

22 Valerie touched upon some aspects of

1 that as well in her comments. I'd love to get a
2 sense from the panelists here. In your
3 perspective or view are we missing any
4 opportunities for public private partnerships here
5 in the U.S. that could help further the goals of
6 making broadband available, making it affordable,
7 bridging the divide, et cetera? I know it's a
8 fairly far reaching question, but I'd love to hear
9 ideas that you may have. Maybe we could work
10 together to make a difference. Please.

11 MR. CORDA: I think certainly in the
12 case of satellite the start-up costs are
13 significant; it's very capital intensive. And the
14 time to get a recovery on that capital is quite
15 long; in general it could be five years or more
16 depending on the system. And so it's usually that
17 period of time before the market develops that
18 access to capital is very difficult and that's
19 where I think a lot of the investment community
20 really needs to look hard at whether or not to
21 make those investments.

22 And so I would say that that's an area

1 that could potentially be a value to the industry,
2 is somehow bridging that gap in terms of providing
3 the guarantees or some sort of underwriting of the
4 capital investment on -- for those early period,
5 so that once the business gets established and is
6 very clear what the returns are, then the
7 activities could be recapitalized at more of an
8 investment venue or vehicle.

9 MS. CORNELL: If I could also jump in a
10 bit, focusing not so much on the mobile satellite
11 side of things, although that's part of it, but
12 focusing on satellite delivered broadband in
13 general.

14 If you're looking at universal service
15 as an option, and obviously that's been part of
16 the deliberations here, the current universal
17 service system definitely does not work well for
18 satellite and, in fact, it doesn't work at all for
19 satellite.

20 I think trying to figure out a way to
21 have -- if you're going to look at public support
22 to stimulate demand and to stimulate the supply

1 side, having a vehicle, having a way of
2 delivering, whether it's universal service or
3 other kinds of funding, to look at the -- again,
4 as I said early, the most cost-effective access in
5 remote areas I think is very important.

6 And the system that focuses on study
7 areas and focuses on, you know, sort of supporting
8 -- is not an effective way to support an
9 alternative, potentially more cost-effective
10 vehicle for delivering broadband, especially in
11 certain context like remote areas then, you know,
12 then other options. So I think it's very
13 important to think of -- a little bit more
14 flexibility -- flexibly about how satellite, for
15 example, and terrestrial mobile, too, for that
16 matter, can be supported effectively.

17 MR. RIX: We work with the Earth
18 Institute at Columbia University and local -- for
19 something we call the Millennium Project. And so
20 that means we have corporations in 10 countries in
21 Sub-Saharan Africa, for example, Kenya, Rwanda,
22 Uganda, Ghana, and others, where we put -- where

1 we have started to put up low-cost base stations
2 with different kinds of backhaul transmission,
3 usually either satellite or microwave, that
4 basically are placed in places where there is no
5 electric grid. So there is no electricity. You
6 have to make a choice. How do you provide them
7 power and the transmission to basically bring
8 broadband and telecommunications to these villages
9 or small communities?

10 And so what we do is we have developed
11 power solutions, for example, solar and wind
12 energy power solutions as opposed to diesel power
13 solutions, which consume, on average, about 10,000
14 liters diesel a year for sort of a standard base
15 station site, in addition to the carbon footprint
16 that you basically create -- that provided quite
17 good -- into providing communications in these
18 villages.

19 And, I mean, it's a transforming sort of
20 life changing initiative because if, you know,
21 somebody that lives in those villages has to walk
22 a day to the next village to either see his

1 relatives or come to a market to sell his cattle,
2 he can now just make a mobile phone call and
3 basically figure out what the price is. Is it
4 worth going? Is it worth selling the -- that
5 we're selling the goods.

6 In addition to that, of course, we have
7 developed, for example, charging stations, solar
8 charging stations that the individuals can use to
9 actually charge their mobiles because there is no
10 power. And so those things, those combinations,
11 are really, really sort of changing entities. We
12 do that in other places as well, you know, we have
13 similar projects that we run into Mongolia, and
14 Cambodia, and the Amazon where we really, really
15 try to make the now available low cost technology
16 available.

17 The key applications in these places,
18 aside from communication, that sort of drive
19 certain economic behavior, are really education,
20 learning where we can put a fixed wireless
21 terminal into a school not too far away from sort
22 of where their base station is located and they

1 can surf the Internet and basically download
2 information, get access to global information in
3 the school.

4 In addition to that it's health care.
5 If you live somewhere in the jungle and you have
6 problems with diarrhea or you have problems with
7 sort of bacterial skin diseases or whatever you
8 have, you all of a sudden have access to sort of
9 medical information that you never had before. So
10 I think with the technology that is becoming
11 available and with the cost points that we have on
12 that technology, it is absolutely possible to
13 break that frontier.

14 MS. DE LA TORRE: Did you -- we'll have
15 a final comment from Valerie.

16 MS. D'COSTA: Well, I just wanted to
17 make a point that when I referenced public-private
18 partnerships there is a plethora of very
19 interesting partnerships and pilots in the markets
20 on a range of applications, as Nils just
21 mentioned.

22 What I was referring to was something a

1 little bit more macro. The World Bank has
2 received a large number of requests for assistance
3 from countries to say if we wanted to implement a
4 national broadband rollout strategy that
5 effectively harnesses the public and the private
6 sector, working in partnership, co-investing.
7 Tell us what's the right way to do this.

8 Now, I think when the client asks, that
9 tells you where the demand is and where the need
10 is. So one thing that I would put out there is
11 there really is a need for creative and
12 collaborative models to be developed at this point
13 of time to look at national broadband rollout that
14 effectively harnesses public and private sector to
15 first of all ensure it's cost effective.
16 Secondly, that it -- it's pro-competitive because
17 some of the models we've looked at really
18 reinforce local incumbency practices. And
19 thirdly, actually grow the markets, grow the local
20 markets themselves.

21 So I think taking these three as the
22 hooks on which to hang your hat, this is something

1 that many developing countries are asking for from
2 the national level. How do you actually partner
3 with the private sector, our own, but others as
4 well to do this collaboratively and creatively?

5 MS. DE LA TORRE: Okay, one more
6 comment.

7 MS. RUFF: If I could just do a very
8 brief comment on this topic. I would underscore,
9 well, everyone's comments, but particularly
10 e-literacy and education as the place to look.
11 And I think you had -- I know you've looked at
12 Korea. I remember that from the first workshop
13 and what they did for sort of e-literacy programs
14 was very interesting.

15 We heard at the Global Symposium for
16 Regulators a story of Turkey that was very
17 interesting in terms of the Turk telecom
18 partnering with the education system and doing
19 things in ways that were similar to e-rate here
20 with schools and libraries, but nonetheless in a
21 very different type of market. And Verizon does a
22 number of things around literacy; we've got

1 UNESCO, Georgetown Higher Ed for Literacy. So
2 those are some places that I think, you know,
3 we've done a lot here. We could probably do more.
4 There may be some things we could learn in
5 exchanges.

6 SPEAKER: Thank you.

7 MS. DE LA TORRE: Great. Well, thank
8 you very much. We've gone over our time and I'm
9 -- I wasn't a very good timekeeper here, but we
10 were -- it was such an interesting discussion that
11 we sort of -- I let it go on. And thank you very
12 much for participating. Thank you. We will take
13 a five-minute break while we set up for the next
14 panel.

15 And a lot of the comments that you've
16 made will fit -- will feed right in to the next
17 panel where we'll be discussing, you know,
18 education and medicine and other things. So I
19 think that -- I encourage you to stay if you can,
20 if your schedules allow you, and thanks again for
21 coming on such short notice.

22 SPEAKER: Thank you.

1 (Recess)

2 MS. DE LA TORRE: Okay. Well, now we're
3 going to start the second panel and this one is
4 going to highlight the actual applications of
5 global broadband and we'll see how these benefit
6 U.S. consumers and in a variety of ways and how it
7 provides benefits worldwide. We'll start with a
8 videotape, actually. It's quite an interesting
9 videotape. And then each of our panelists will
10 give the five-minute presentation that you had the
11 opportunity to do at the last panel, and then
12 we'll have a discussion period just like during
13 the last panel.

14 So we're going to start a -- with a --
15 the videotape. And this is very special and I'm
16 really very happy to have this here. The members
17 of the U.S. Air Force's 379 Expeditionary
18 Communications Squadron will explain the benefits
19 of international commercial broadband
20 communications to services as they're deployed in
21 Southwest Asia.

22 And so with the recent addition of more

1 mobile -- of wireless access points to such
2 benefits are the increase of morale. Evidently
3 it's just been a tremendous morale booster, as
4 well as the educational opportunities, which I
5 think a lot of us don't necessarily think about
6 for U.S. Servicemen and the Department of Defense
7 civilians that are working there as well. And
8 obviously this is particularly relevant during the
9 period of holidays that are coming up, and so
10 let's role the tape and see what we have.

11 (Videotape shown)

12 MS. DE LA TORRE: So that was a very
13 nice way I think to start off our second panel,
14 finding out how it is that our servicemen and
15 women can use broadband capabilities while they're
16 deployed overseas. And so now we have a panel of
17 four distinguished guests and I will introduce
18 each of them like I did the last time, in order,
19 and then we'll have -- give everybody a chance to
20 speak for five minutes.

21 First we have David Mihelcic from --
22 who's the chief technology officer at the Defense

1 Information Systems Agency, known as DISA. And I
2 think we're very pleased to have him because he'll
3 follow up on some of the conversations that we saw
4 there. And he's responsible for defining DISA's
5 overarching technical strategy for synchronizing
6 the agency's programs and services with the
7 Department of Defense's net centric
8 transformation.

9 And then we have Dr. Theodore Stone.
10 And Dr. Stone is the director of the academic
11 technology at the University of Maryland and at
12 University College. And there he's a professor,
13 and in that role he monitors and evaluates
14 emerging technologies for review in potential
15 inclusion into the University's e-learning suite.
16 He also teaches a master of education program
17 where he specializes in the field of educational
18 technology. And he's been teaching since 1992 I
19 think, so welcome.

20 And then we have Dr. Joel Selanikio, who
21 is the director of DataDyne. And he's a
22 practicing pediatrician, a former Wall Street

1 computer consultant, and a former CDC
2 epidemiologist with a passion for combining
3 technology and public health to address inequities
4 in developing countries. And he leads DataDyne's
5 pioneering efforts to develop and promote new
6 technologies for health and international
7 development. And we was the winner of the 2009
8 Lemelson MIT Award for sustainability and the 2009
9 Wall Street Journal Technology Innovation Award
10 for Health care and IT, so welcome.

11 And then we have Paul Margie, who is one
12 of the esteemed alumni of the FCC coming back to
13 see us again. And Paul is a partner at the Law
14 Firm of Wiltshire & Grannis, where he focuses on
15 telecommunications and technology law. And he
16 also is the U.S. Representative of Telecoms Sans
17 Frontieres, the Telecommunications without Borders
18 Relief Organization based in Southern France, that
19 does a lot of work with -- when there's an
20 emergency communications facilities in war and
21 other disaster zones. And one of his previous
22 jobs, which we also hope he'll bring some of that

1 experience to bare today as well is when he was
2 senior director for technology partnerships at the
3 United Nations Foundation, where he worked on
4 worldwide partnerships with -- group using
5 technology to advance development. So thank you
6 very much and welcome.

7 And David, why don't you start us off
8 here, please?

9 MR. MIHELICIC: Thank you. So behind me,
10 if I only had one slide to present this would be
11 it. This is the vision of the director of the
12 Defense Information Systems Agency Lieutenant
13 General Pollit, United States Army. Leaders
14 enabling information dominance in defense of our
15 nation. That is what we strive for and I'm going
16 to talk to you a little bit about the details of
17 our mission and how we try to bring this vision to
18 reality. So next slide, please.

19 I have to advance them myself, all
20 right. So next slide, excellent. DISA is a
21 combat support agency and I'll talk to you a
22 little bit about what that means in just a moment.

1 But we engineer and provide the Department of
2 Defense with joint command and control
3 capabilities and provision and operate a global
4 enterprise infrastructure that supports the DOD's
5 net-centric war-fighting goals.

6 We support everyone from the President
7 of the United States down to the war-fighter in
8 the foxhole. We are a defense agency. We are not
9 one of the military services. We report up
10 through the Assistant Secretary of Defense for
11 Networks and Information Integration, DODCIO; the
12 Acting Assistant Secretary is Ms. Cheryl Roby to
13 the Secretary of Defense, Mr. Robert Gates.

14 We support all branches of the military
15 -- Army, Navy, Air Force, Marines, as well as
16 Coast Guard -- in certain circumstances, as well
17 as the combatant commanders. These are the
18 priorities of the Defense Information Systems
19 Agency. As I mentioned, we provide an enterprise
20 infrastructure that includes long-haul
21 telecommunications, computing, and enterprise
22 services. And I'm going to talk about those in

1 detail in a moment so I won't dwell on those.

2 Command and control, we provide the
3 DOD's joint command and control capabilities. It
4 allows senior leaders, combatant commanders to be
5 able to present orders to the forces that support
6 them provided by the military services and get
7 status on the effectiveness of those forces.

8 We operate and ensure not only the
9 infrastructure that DISA provisions for the
10 Department of Defense, but also through a
11 partnership with the Joint Task Force for Global
12 Network Operations. We work to assure the
13 information security of all DOD systems.

14 Let's talk a little bit about the
15 infrastructure, the enterprise infrastructure
16 which I mentioned. And I think this slide here
17 really sums up the topic of, you know, today's
18 discussion that we operate for the Department of
19 Defense a global broadband network.

20 It's a provision primarily through a
21 commercial telecommunication services in a variety
22 of ways. We have dark fiber, which we IRU through

1 long-term agreements with various providers to
2 provide a footprint that addresses not only the
3 Continental United States, but Europe, the
4 Pacific, and into Southwest Asia. In areas where
5 we can't access IRU fiber, we enter into long-term
6 relationships with vendors to access wavelength
7 services, OC192 wavelength services, and, in many
8 instances, take that down to incremental bandwidth
9 down to fractional T-1's in some circumstances.

10 At the bottom there's an interesting
11 metric there. Between February of 2005 and March
12 of 2009, we've seen an order of magnitude increase
13 in this underlying infrastructure that we provide
14 for the Department of Defense through upgrades
15 that were put in place through a program called
16 the Gig Bandwidth Expansion where we acquired
17 global fiber optic capabilities.

18 We also provide broadband support to
19 deployed war- fighters through a series of
20 tactical gateways known as teleports or step
21 sites. These sites are joint capabilities that
22 are attached to that global broadband fiber optic

1 network to allow voice, video, and data services
2 to be accessed by deployed war-fighters and, in
3 some cases, soldiers in the field through a --
4 move satellite capabilities. We don't merely
5 provide transport services, we provide a full
6 spectrum of interoperable network services:
7 Voice, video, and data. Our goal is to move all
8 of this capability to an IP infrastructure and we
9 operate those IP infrastructures at both the
10 unclassified and classified levels.

11 For the IP and voice systems, we gateway
12 to commercial networks at the unclassified level
13 so we have secured controlled gateways to the
14 Internet from our unclassified IP router network,
15 the NIPRnet, and to the plain old telephone
16 system, the public switch telephone network from
17 our DSN, our Defense Switch Network. Our
18 classified networks, the secret IP router network
19 for data and the Defense Red Switch Network for
20 voice, are closed networks that are specifically
21 for command and control purposes and are secured
22 through high-grade NSA encryption.

1 As part of the global infrastructure, we
2 don't merely provide telecommunication services.
3 We also operate the DOD's mainframe and server
4 computing centers; 12 in the Continental United
5 States, as well as centers in the Pacific and
6 Hawaii, in Europe and Germany, and in Southwest
7 Asia and Bahrain, were made the DOD's main command
8 and control and other joint applications are
9 operated.

10 And finally, we operate a series of
11 enterprise services that support the joint
12 war-fighter: Everything from web collaboration
13 capabilities, to messaging services, to services
14 to enhance the sharing and discovery of
15 information.

16 We operate and ensure this network by
17 having a series of deployed operations globally.
18 We are co-hosted with every combatant commander in
19 the United States, as well as globally, and we
20 have troops deployed on -- in the -- on the ground
21 in Iraq and Afghanistan in support of the
22 telecommunications and computing capabilities we

1 provide to the war-fighter.

2 And that's the end of my presentation.

3 Thank you.

4 MS. DE LA TORRE: Thank you very much.

5 Dr. Stone, please.

6 DR. STONE: Mindel, thank you very much,
7 and also Anurag, thank you very much for
8 moderating. UMUC is grateful to the FCC for the
9 invitation to participate in this workshop. David
10 Mihelcic, before I get started, I have to tell
11 you, thank you so much for that DISA video. It
12 was really fantastic and it tells very much the
13 story of how we're providing on the ground courses
14 and online education to the military overseas.

15 I have to -- before I get into my
16 presentation I just have to tell you, we need more
17 bandwidth. You guys have done a great job, but I
18 just -- I'll give you a very quick example and
19 I'll shave a few minutes off of my presentation.

20 In one of the online classes I was
21 teaching last year, I had two active duty soldiers
22 signed up for my class in Iraq. And as part of my

1 class we do -- it's mostly synchronous online, but
2 we also do audio and video conferencing one-on-one
3 with the students and the -- to the professor.

4 I had one student who was stationed
5 south of Baghdad, who had to get online with me at
6 4:00 in the morning his time, not because of time
7 zone differences, but because all of the soldiers
8 on the base get online with the civilian network
9 that you've set up to video conference with Skype
10 or Yahoo Messenger back to their families and to
11 talk to their spouses, and children, and so forth.

12 And so to -- for us to have a clean
13 bandwidth, he had to get on very early his time
14 when everybody else was asleep in the barracks.
15 So great job; we need more.

16 Now let me get into my presentation and
17 I promise to shave off a few minutes. Let's see,
18 next -- there we go. Let me just say a few words
19 about UMUC. University of Maryland University
20 College is -- as the state of Maryland's main
21 provider of adult and continuing education we
22 began in 1947, you'll see this a bit on my next

1 slide, providing on- the-ground higher education
2 to U.S. troops stationed in Germany and then later
3 in Asia.

4 We are the largest public provider of
5 online education in the United States and we're
6 one of the largest in the world. We have about
7 90,000 students worldwide; we employ more than
8 3,000 faculty. We focus on the adult learner; 90
9 percent of our students in the United States and
10 worldwide are working adults. We -- 57 percent
11 are women and a very large amount of our
12 graduates, 42 percent are underrepresented
13 minorities, and, in fact, in the state of Maryland
14 we graduated more underserved minorities than all
15 of the other universities in the state combined.

16 This is an interesting slide because it
17 shows the growing on online learning. This is
18 very relevant to the topic today on broadband and
19 how we connect the United States globally. Since
20 the year 2000, we had -- in the year 2000, rather,
21 we had about 35,000 enrollments online.

22 Now this chart only goes up to the year

1 2007 graphically because I ran out of room going
2 to the right, but last year, in 2008, we had
3 almost 190,000 online enrollments worldwide. And
4 you can see while most of that is stateside, here
5 in the United States, a significant portion of
6 that is also in Europe and Asia.

7 And before I get into some of the global
8 dynamics here, this is an interesting little data
9 mining map by ZIP code of where our students are
10 around the United States. So when we think about
11 broadband, not just globally, but domestically,
12 the importance of connecting students into this
13 infrastructure is critical -- critical -- to
14 economic growth and development in the United
15 States and how we connect globally and build
16 economically in our country.

17 As was mentioned, and thank you for that
18 video, it said it better than I'm going to say it
19 now, UMUC serves the U.S. military wherever they
20 are on the ground. We are serving about 10,000
21 active duty servicemen and women throughout the
22 world. We -- aside from our headquarters in

1 Adelphi, Maryland, we are -- we have a
2 headquarters in Heidelberg, Germany, and we -- out
3 of that headquarters we serve 21 countries at 100
4 locations, and including Iraq and Afghanistan
5 where we have faculty on the ground serving our
6 military. Also, we have a headquarters at Yokota
7 Air Force Base just north of Tokyo and we serve 50
8 locations throughout Asia, including Okinawa and
9 Seoul Korea.

10 We have a host of programs: 32
11 undergraduate degree programs and 14 master degree
12 programs and a doctor or management program. All
13 of these programs -- almost all of these programs
14 are available in the online setting and, as I
15 mentioned, we had nearly 190,000 online
16 enrollments worldwide last year.

17 We also have a number of international
18 collaborations which include dual degree programs
19 and collaborative programs with universities in
20 Vladivostok; Irkutsk; Oldenburg, Germany; Sofia,
21 Bulgaria; and Istanbul Turkey; and other
22 locations.

1 Finally, just to close and to repeat, in
2 case you couldn't tell, I was enthusiastic about
3 online learning, it enfranchises people to
4 advance, to advance through careers and to get
5 ahead economically, and we believe it also helps
6 to build bridges globally as well.

7 Thank you very much.

8 MS. DE LA TORRE: Thank you very much,
9 Dr. Stone. And at that particular base where you
10 saw they had a very large University of Maryland
11 -- there. I don't think they had a full-time
12 person who was working with a lot of the students
13 there. So it's great.

14 Okay. So now Dr. Selanikio.

15 DR. SELANIKIO: Sure, thanks. Am I on?
16 Yeah. First of all, thanks for the opportunity to
17 speak at the panel. I've been pretty excited
18 actually about some of the stuff I saw both in the
19 first panel and earlier. I'd repeat the call for
20 more bandwidth, please. And as I often do, I'll
21 thank any representatives of the mobile or
22 broadband industry who are here for making my job

1 a heck of a lot easier.

2 I'm a public health doctor with a
3 background in technology and I also practice
4 pediatrics at Georgetown. I run an organization
5 called DataDyne. We're a 10-person organization
6 with offices in Washington and Nairobi, Kenya.
7 And we essentially develop software to support
8 public health and international development
9 worldwide. And it really is only the developments
10 in mobile and broadband that have enabled such a
11 small organization to have as broad a reach as
12 we've had and I'm going to talk to you a little
13 bit about that.

14 I think people have seen this slide or
15 something like this slide. This focuses in on
16 Africa and mobile penetration. The bars, which
17 use the left-hand scale, are the number of mobile
18 subscribers and it's roughly, let's say, half a
19 billion people in Africa, starting from a very,
20 very low point not that long ago. And the line in
21 the middle of it shows that we've -- we're just at
22 the point of exceeding 50 percent of the

1 population with access to mobile. This is not
2 necessarily mobile broadband, but mobile at all.

3 Now, if you were to actually forget
4 about the mobile part and just look at broadband
5 access in Africa in general, it's kind of hard to
6 distinguish that red line from the base line. And
7 so this is the world in which if you're working in
8 international development or international public
9 health, this is the world that you work in. It's
10 a world that has a lot of mobile and this is
11 miraculous and we're not complaining, but very,
12 very little broadband at this point.

13 So the question then is how can we, for
14 the purposes of getting kids vaccinated, getting
15 more information about what we do, running
16 clinics, et cetera, how can we harness this world?
17 We have a lot of mobile and just a little bit of
18 broadband. And I think we have lots and lots of
19 examples in our own personal lives of how people
20 have managed to make excellent functionality
21 available to people via broadband, web
22 applications that are instantly scaleable all

1 around the world.

2 One example that many people use is
3 Facebook, which you can either access via a
4 website or, of course, you can access a subset of
5 Facebook's functionality on a mobile phone. This
6 for us is a model for how we can address this
7 issue of lots of mobile and a little bit of
8 broadband.

9 Now in the United States, when I use web
10 applications on my laptop and then on my phone,
11 it's really a question of the same person who at
12 different times of the day or different days of
13 the week has access to different capabilities
14 versus -- in terms of mobile or in terms of the
15 large-screen broadband experience. In Africa,
16 it's more often likely to be that some segments of
17 the population have access to broadband on a large
18 screen and other parts of the population only have
19 access to low bandwidth mobile. So we decided why
20 don't we build a web application similar -- along
21 the lines of these web applications I've mentioned
22 for public health?

1 And specifically, what we did was create
2 something called EpiSurveyor, which addresses the
3 need in public health to be able to collect data
4 about what we do. This ability to collect data is
5 the underpinning of everything we do. It's how we
6 know whether the number of people with HIV in a
7 particular country is going up or going down, it's
8 how we know what percentage of children are
9 receiving vaccinations, it's how we keep track of
10 vaccine supplies and other logistic issues.

11 So EpiSurveyor, which is the name of
12 this application, allows you to -- allows the
13 population, the subsegment of the population that
14 does have access to broadband to go online at a
15 website and create a forum, like the forum
16 represented here schematically, and then to push
17 that forum out to simple mobile phones. And we're
18 not talking about iPhones or smart phones; we're
19 really just talking about sort of \$40, \$50 mobile
20 phones, which I'm very happy to report are now in
21 the possession of essentially every single health
22 provider in Sub-Saharan Africa. And I would say

1 that went from about -- that was from about zero
2 10 years ago to every single health provider in
3 Sub-Saharan Africa now has a pocket computer
4 connected to the network.

5 So we are able to push these forums out,
6 have people collect information out in the field,
7 even in the most remote field locations, push that
8 information back, and instantly create a report
9 including graphs, et cetera, things to help people
10 understand what it is that they've -- what it is
11 that they've collected; Google maps, integration,
12 all of this stuff.

13 In Kenya, what this means is that
14 Ministry of Health officials who are in Nairobi,
15 who have excellent broadband web access on a large
16 screen are able to design, essentially, data
17 collection systems, while Ministry of Health
18 workers in the more rural areas of the country who
19 just have simple phones, are able to collect data
20 and upload it over the network in real time.

21 This means that rather than the previous
22 method, which was to wait 6 to 12 months, and

1 that's probably an underestimate, just to have the
2 paper data entered into a computer for analysis,
3 Kenya now has real-time data collection, immediate
4 analysis, and same-day action whether they are
5 investigating an outbreak or running a vaccination
6 campaign or distributing bed meds. Again, this is
7 a question of connecting the many who have mobile
8 and the very few in these settings who have
9 broadband.

10 Since EpiSurveyor.org, the website was
11 launched in June -- and, of course, it's a website
12 so it's available from anywhere -- we've had
13 almost 1,000 users from 500 organizations in 100
14 countries who have filled out about 12,000 forms.
15 We've not even had a public information campaign,
16 but I'm happy to report that this application,
17 which is developed in Kenya by our Kenyan
18 programmers, is now being used by, among others,
19 DOD, many of the branches of the U.S. Government,
20 the Government of Canada, European Governments,
21 500 nonprofit organizations all around the world,
22 not just in Kenya.

1 For this we've been very happy to
2 receive the Wall Street Journal Technology
3 Innovation Award this year for health care, which
4 we, as an organization of 10 people, proudly point
5 out was won last year by Raytheon. More
6 importantly than winning awards is the fact that
7 now in Kenya and in all of these other places
8 people are able to, at a fraction of the previous
9 cost, have real-time data systems to be able to
10 provide vaccines, manage supplies, track
11 outbreaks, and, in the end, save lives.

12 The lessons for me are, one, you can use
13 these lessons of things that we use sort of
14 sometimes seriously, sometimes trivially in our
15 lives like g-mail, Facebook, et cetera, to use a
16 little bit of mobile broadband until we get the
17 rest of it, which we're hoping for, to coordinate
18 a lot of very simple mobile phones. And you can,
19 of course, using those same lessons, scale those
20 applications immediately worldwide, again, at a
21 fraction of the previous cost.

22 I put this slide in just to remind

1 myself I'm supposed to be having fun while I do
2 this and generally I do. I'll be happy to answer
3 questions at the break.

4 Thanks.

5 MS. DE LA TORRE: Thank you, that was
6 fascinating. Paul, would you like to continue,
7 please?

8 MR. MARGIE: Great. I'd also like to
9 thank the FCC for inviting me here. I'm very
10 happy to be back. And today I'm going to talk
11 about two organizations that -- one I used to work
12 for and one I am now working -- continuing to work
13 for. So when I left the FCC, I went to the United
14 Nations Foundation, which is a charitable
15 foundation that had created a new fund to try to
16 advance the use of technology in telecom for
17 international development with the Vodafone Group
18 Foundation. And the first thing we did was we
19 were given the opportunity to take almost a year
20 to survey what a wide range of U.N. organizations,
21 not-for-profits, governments were doing in the
22 application of both narrowband and broadband

1 technologies to advancing or trying to tackle the
2 biggest problems that they had in achieving the
3 millennium development goals or other public
4 policy goals that they had.

5 And this was a really eye-opening
6 experience. You would see folks doing very, very
7 creative things to kind of the technology of
8 yesterday to try to attack some of the biggest
9 problems in the world. So whether that was food
10 insecurity problems or emergency response
11 communications or vaccination programs, as Dr.
12 Selanikio talked about, there was a wide variety
13 of issues.

14 And the -- we learned a couple of
15 lessons in doing that and then chose a few areas
16 to focus on. One of them was emergency response
17 communications, especially in the period of 24
18 hours to about 60 days after an emergency hit.
19 After about 60 days it was -- emergencies enter a
20 different period and there are a different set of
21 tools that might be available. But that critical
22 first period was one that we believed a technology

1 could make a big difference and that technology
2 was not making a big enough difference at the
3 time.

4 And then the other one was in the use of
5 telecommunications in technology for a data
6 gathering for public health where we thought this
7 was a perfect place where the introduction of some
8 funding and some fresh thinking could really
9 change the game in public health.

10 So we then moved to fund a couple of
11 organizations. One is an organization called
12 Telecoms Sans Frontieres, or Telecom Without
13 Borders, and the other one was Joel's
14 organization, DataDyne. And so Joel has talked to
15 you a lot about DataDyne and I'm here to talk to
16 you about Telecoms Sans Frontieres.

17 But before I do that, though, the U.N.
18 Foundation is now also working on an interesting
19 project, which is a wider one, which is the Mobile
20 Health, or M Health Alliance, where they are now
21 looking to take the next step and tackle some of
22 the sometimes not technology oriented problems

1 that are in the way of wider adoption of
2 telecommunications and technology for public
3 health. They are working, again, with the
4 Vodafone Foundation and with the Rockefeller
5 Foundation to try to gather as much learning as
6 possible about the use of Mobile Health
7 internationally and about what legal regulatory
8 technology funding coordination problems stand in
9 the way of the wider applications of these
10 technologies.

11 So let me talk a little bit about
12 Telecoms Sans Frontieres, and what they do, and
13 where they came from, and then maybe some lessons
14 from this that might be useful for the National
15 Broadband Plan. So Telecom Without Borders was
16 founded a little bit more than 10 years ago when a
17 set of folks in Europe were providing more
18 traditional emergency response commodities in the
19 Balkan area during the war there. So it is a very
20 unstable time in the Balkans and there was a lot
21 of food insecurity, a lot of health care problems,
22 and they had brought the types of things that had

1 traditionally been brought to an emergency
2 situation, clothes, food, and medical supplies.

3 And what they realized was when they
4 were working with the civilian victims of the war,
5 that they were asking for telecommunications.
6 They had one satellite phone that they carried
7 with them and more than food, more than health
8 care even. The first thing they wanted was
9 communications because that communications link
10 was the thing that would enable them to tell their
11 family that they were alive or that members of
12 their family had died; that their true need was a
13 financial one or a medical one or an information
14 one to reconnect families that had ended up in
15 different camps.

16 And so they would go to these refugee
17 camps and there would be a facility for providing
18 medical care, a facility for providing food, and
19 as the refugees would stream in through the
20 mountains in the Balkans, the first line that they
21 would get in would be the one for the use of this
22 one and then soon after that many communications

1 facilities.

2 They then redesigned their program into
3 Telecom Without Borders to provide exclusively
4 communications in emergency situations. And they
5 grew from the Balkans to a wider variety of
6 emergencies. They've now, the past 10 years,
7 responded in I think 30 or 40 different countries
8 from very large emergencies like the Asian tsunami
9 to smaller emergencies in the Democratic Republic
10 of Congo or other places. And they do this using
11 a variety of technologies.

12 Their base technology that they use most
13 frequently is the BGAN system, which they deploy
14 with on every emergency. When they arrive at the
15 emergency there are times that they will find a
16 working CRS system and they will use the
17 terrestrial wireless system. There are times that
18 they find that they are playing more of a
19 networking role or an IT role because the system
20 is working and there are other times where they're
21 finding there's no connectivity at all and the
22 satellite system is critical for them at that

1 stage. So -- and I'm happy to go into more depths
2 on the types of technologies that they use or the
3 barriers that they've found in those situations.

4 So three quick things, I think, that are
5 worth thinking about. One is that U.S. policy on
6 telecommunications really matters in the
7 international context. And I saw that again and
8 again and again. This is especially true in
9 spectrum policy where international regulators,
10 ministries, NGOs, companies, really watch what the
11 FCC is doing on spectrum policy and wireless
12 policy, whether that's the things that sometimes
13 we see as everyday issues, like interference
14 regulation or equipment authorization issues, all
15 the way to the game-changing things that the FCC
16 has done, like the switch from comparative
17 hearings to auctions in the past or similar kind
18 of game- changing shift from -- to promoting
19 licensed technologies and white spaces.

20 These are the things that people watch
21 and our leadership matters there. And this
22 leadership and these changes matter for American

1 consumers in two big ways. One is that they
2 produce the economies of scale when we make these
3 changes worldwide and people adopt these changes
4 that allow American consumers to get lower prices
5 and hear. And the second is that it creates the
6 incentive for American companies to invest in the
7 types of innovations when they've got a worldwide
8 network that result in innovations available for
9 American consumers as well. So what we do here
10 matters internationally.

11 The second is that broadband is one part
12 of the puzzle, but, as Dr. Selanikio said, it's
13 not the only one and often there are incredibly
14 important things that we do with some broadband
15 and a lot of relative narrowband, especially in
16 the wireless context.

17 And then third, while the role of the
18 FCC and the role of some of the agencies that
19 you'll be advising as part of the National
20 Broadband Plan can be quite different.

21 A build it and they will come attitude
22 at the FCC is the right one. The FCC's job is to

1 push the network as far as possible. But on the
2 other side, the implementing agencies are really
3 thinking about their missions and sometimes that
4 missions means an influx of technology or
5 telecommunications matters; sometimes it's other
6 things. Sometimes it's broadband and sometimes
7 it's not. And so I'm happy to talk about those
8 more as well.

9 MS. DE LA TORRE: Thank you very much.
10 So we had all different perspectives and I think
11 everybody wants more broadband now; got that
12 message. And we have a question here that says
13 what are the objectives, plans, and or challenges
14 of providing global broadband connectivity in the
15 Polar Regions, such as land, sea, air, and I think
16 we can probably ask that of David. I don't know
17 if that's something that you've been thinking
18 about.

19 And actually, you know, we're quite
20 lucky to have David because I think he had a bit
21 of an accident that he might have needed one of
22 the two doctors to help him with. This morning he

1 was running and accidentally hit somebody else or
2 somebody fell in front of you, so we're very lucky
3 to have him here.

4 MR. MIHELICIC: We had a minor pile-up on
5 our formation run this morning. So you know, we
6 need to provide narrowband and broadband access
7 globally to Department of Defense units.

8 So for example, you know, Polar Regions,
9 that is a requirement to serve, in particular,
10 Navy float platforms and we rely on a combination
11 of methods, MILSATCOM and commercial SATCOM and
12 continue to promote the development of commercial
13 SATCOM in support of those broadband capabilities,
14 and have a program, WGS, Wideband Gapfiller
15 System, which is our most recent broadband
16 MILSATCOM, that I believe the third or fourth bird
17 was just launched last Friday.

18 MS. DE LA TORRE: Thank you. And Dr.
19 Selanikio, I was wondering on your
20 EpiSurveyor.org, who is the -- who's the one that
21 actually manages that database? Is it managed out
22 of Kenya? Is it managed out of your offices here

1 or where?

2 DR. SELANIKIO: You mean where is the
3 data actually stored?

4 MS. DE LA TORRE: Yeah.

5 DR. SELANIKIO: Well, in multiple
6 locations around the world. Like with most -- I
7 mean, we're kind of a small fry in the web
8 application business, but, you know, where does
9 g-mail store its data and servers? In several
10 different countries at the same time for
11 redundancy. We don't have the capacity at all to
12 have a -- I mean, by the end of this year we'll
13 have probably 3- or 4,000 users accessing hundreds
14 of thousands of data records.

15 And so we hire service space from a
16 company called Rackspace, which is one of the
17 providers of service space. Again, this is
18 something that we started out doing it ourselves
19 and quickly exceeded our own capacity to do that.

20 MS. DE LA TORRE: You're basically using
21 a cloud computing kind of application to help you?

22 DR. SELANIKIO: Right, right.

1 MS. DE LA TORRE: Okay, great. Anurag.

2 MR. LAL: Yeah, first let me just start
3 and acknowledge the strength and power of the
4 video that was shown up front. I can't but
5 acknowledge the great work that our Armed Forces
6 are doing in protecting us and keeping our
7 countries safe. But it's really heartening to see
8 that as they go out and do what they do well, we
9 are making available to them technology and
10 connectivity that hopefully tries to reach the
11 disruption that goes through their lives through
12 education and through providing connectivity back
13 to their families.

14 And it's great that we are talking about
15 all of those technologies and seeing that
16 real-life application was really powerful, so
17 thank you for that. So during the course of the
18 presentations and as we've gone out and spoken to
19 a bunch of other folks, we've always been asked
20 and told we want more of bandwidth in every which
21 shape and form. And so I'm going to challenge the
22 panel here a little bit and -- that request for

1 more, which I heard a couple of times during the
2 course of the presentation, and see what more
3 means in your minds, with regards to actual
4 bandwidth.

5 There are a lot of applications out
6 there that are being leveraged, some of which were
7 talked about here. What else do all of you see or
8 plan to use that would benefit from that
9 incremental bandwidth?

10 MR. MIHELICIC: In terms of applications
11 you mean?

12 MR. LAL: Yes.

13 MR. MIHELICIC: So, you know, from the
14 DOD point of view, one of the biggest drivers is
15 imagery and full motion video, and having that
16 available not only to analysts deployed globally,
17 but also to the war-fighter in the field.

18 It's extremely important, you know,
19 having a deployed war-fighter be able to see on a
20 handheld device what's over the next hill is
21 critical. And we have done a number of
22 experiments and pilots recently in looking at

1 being able to push full motion video to handheld
2 devices. And the National Security Agency has
3 actually developed two handheld devices that will
4 allow broadband capabilities to be pushed to a
5 handheld device securely, as well, with military
6 grade encryptions. So I think that full motion
7 video imagery, hyper-spectral imagery, are really
8 the -- sort of the killer applications driving
9 bandwidth and the DOD.

10 DR. STONE: Well, there's -- from the
11 perspective of higher education there's two
12 aspects of this. Aspect one is simple access.
13 About 10 percent of our students who are currently
14 enrolled connect by dial-up modem. And I think
15 that number is understated in that there are
16 students who are self-selecting not to enroll in
17 higher education programs because they simply
18 don't have access to broadband. So gaining
19 access, I think, is vital to people gaining access
20 to higher ed and enhancing their careers and
21 becoming more productive.

22 The other aspect of this is the quality

1 of the connection and the speed becomes critical,
2 particularly when we look at applications that
3 require higher connectivity. We're developing
4 virtual labs right now to access a graphics art
5 curriculum using a product as simple as Adobe
6 Photoshop except that it requires a very high
7 level of bandwidths because the students are using
8 the software remotely. Even a small amount of
9 lag, say on minute motions of the mouse in
10 coloring a photo, can have an impact on the
11 quality. So -- but this becomes critical as
12 students explore programs and careers.

13 DR. SELANIKIO: For us at DataDyne, I
14 think while, of course, we love the bandwidth,
15 we're also focused on the other end of the
16 question, which is even things as basic as SMS,
17 which because it's ubiquitous is, again, frankly,
18 miraculous for those of us working in public
19 health, the fact that we now have the ability to
20 send or receive any data from any phone in the
21 world, from those billions of cell phones. And, in
22 fact, in some cases I think the bandwidth actually

1 won't particularly help.

2 And an example I would give for that
3 would be today in the United States, I can text
4 the name of a -- W or the word "weather" and then
5 a ZIP code or the name of the city and I send it
6 to a certain number, which is operated by Google,
7 and then it texts me back, as an SMS, the weather
8 report for the next three days. Now I can tell
9 you that on my iPhone when I go to the weather
10 thing and I look at the weather for Washington, it
11 doesn't actually give me any more information; it
12 just gives me a picture of a sun and the
13 lightening bolt and clouds, which I actually have
14 an image of those things stored in my head, cached
15 as it were. And so the SMS message that -- is
16 actually exactly as functional as the iPhone
17 application in that particular instance.

18 On the other end of the spectrum, even
19 the fact that we as a small organization are able
20 to run a team, produce software, transmit
21 information, have a web application that's
22 reaching 100 different countries on a budget as

1 low as ours, is -- would be simply impossible
2 without the advances in bandwidth that have taken
3 place really just in the last three or four years.
4 Five years ago, we could never have made an
5 EpiSurveyor web application or any of the other
6 things we do. So it's really in some cases not
7 even a question of we'll be able to do what we're
8 doing faster; it's a question of whether we'll be
9 able to do it at all.

10 MR. MARGIE: I think for Telecom Without
11 Borders and others that I've seen in the NGO
12 space, you know, additional bandwidth would be
13 terrific, but their decisions, I think -- they
14 always have limited funds and so their thought is
15 really not, first, let me make sure I get as much
16 bandwidth as possible. It's -- for each dollar
17 I'm spending, what's the thing that's going to
18 achieve my goal marginally the best? And so in
19 some cases that is training or equipment or
20 investment in an application rather than
21 additional bandwidth. And I think they are
22 constantly making that decision. So if there's

1 more bandwidth out there and it's cheaper, than
2 that changes the calculation, but the calculation
3 is always the same. So it's never really about
4 the -- they don't think about it in that term so
5 much.

6 Now, there are clearly -- in education
7 there are applications where video matters a lot.
8 In the emergency response context, some very
9 sophisticated users are doing video in developed
10 economy responses. In a lot of the Telecom
11 Without Borders responses, the key thing is Excel
12 files, you know. Really it's, you know, which
13 palette in the incoming ship is the food that I
14 need on? How many insecticide-treated bed nets
15 are going to be here versus there? What's the
16 helicopter schedule? What is the mobile phone
17 numbers of all of the key people?

18 This isn't bandwidth intensive stuff, so
19 it's coverage that really matters a lot. They
20 want to make sure whether they're responding to an
21 earthquake in Pakistan or a migration or a refugee
22 incident on the border with -- and Thailand, they

1 need coverage there. And they'll take what
2 bandwidth they can get and invest their money
3 where they're going to get the most bang for their
4 buck.

5 MR. LAL: Any additional questions from
6 the audience?

7 MS. DE LA TORRE: Okay. Well, then I
8 have another one. What do you do, Dr. Selanikio,
9 in a situation where you have many different
10 languages in Africa and so you're dealing with a
11 lot of the different languages? And what do you
12 -- I'll ask you two questions.

13 And what do you see as there is more
14 mobile broadband in Africa, how do you see that
15 helping the applications because I think that, you
16 know, what you all are doing with the sort of
17 lower bandwidth mobile with the little bit of
18 broadband that you get is very interesting. But
19 how do you see that as moving forward in the next
20 few years as there becomes more mobile broadband
21 in Africa?

22 DR. SELANIKIO: Well -- sorry, the first

1 question was?

2 MS. DE LA TORRE: The first question was
3 what do you -- how do you deal with the different
4 languages all throughout Africa?

5 DR. SELANIKIO: Well, first of all, I
6 mean, I hasten to say, it's far beyond Africa at
7 this point. In fact, at this point, although we
8 originally began in Africa, we developed the
9 software in Africa, we were thinking about Africa,
10 we have more users overseas from Africa than we do
11 actually in Africa. And again, that includes many
12 users in the United States using it for a variety
13 of different things.

14 In terms of what do we do for languages,
15 I think our basic approach has been what Americans
16 always do for languages, which is we speak
17 English. But we are also -- we've also taken
18 steps to start adding additional languages to it,
19 but even more so to make it so that the users, if
20 there's a user out there who speaks Portuguese and
21 is willing to put the time and to help us
22 translate some of the functions, that that becomes

1 not just an easy process, but a process where they
2 can submit that automatically.

3 So at this point, we've got EpiSurveyor
4 in Spanish, English, French, and also in
5 Kiswahili, which was a demand of our key Swahili
6 speaking programmers. And I expect before the end
7 of the year we'll have it in probably five other
8 languages, including languages using different
9 alphabets, like Cyrillic, for example. And again,
10 that will be from user contributions. We simply
11 don't have the funding to pursue it on our own.

12 And I have -- again, I have forgotten
13 your second question.

14 MS. DE LA TORRE: The second question
15 was using -- as more users in -- around the world,
16 actually, go to mobile broadband, how do you see
17 that your usage will be -- will change and the
18 functions that you're doing?

19 DR. SELANIKIO: Well, I think Paul
20 really touched on it pretty well in the sense that
21 a lot of the stuff we do -- for us the primary
22 task is making sure everyone can do it at some

1 level, so coverage, and I think we're achieving
2 that pretty well.

3 I think it -- it's -- I never would have
4 predicted years ago that we'd have what we have
5 and so it's quite difficult, again, especially for
6 a small organization to plan for what the
7 technological changes will be. People talk about
8 a lot of things that may come or what we will have
9 and so, again, not being sure, we tend to focus on
10 those coverage issues of trying to make it work
11 well on a low level.

12 At the same time, we have some users who
13 are actually quite well-funded and who are willing
14 to pay for us to enhance the software in such a
15 way that is of benefit to those who have high
16 bandwidth or those who have iPhones or who are
17 running android phones, et cetera. And so we're
18 taking advantage of that as we -- as funding is
19 made available, but never losing sight of the fact
20 that, again, the majority of our users and
21 probably the users with the most critical need are
22 the ones who are on the low bandwidth and at the

1 scale.

2 MS. DE LA TORRE: Would you like to --

3 SPEAKER: No, I'm good.

4 MS. DE LA TORRE: All right. Well, I
5 think our time is up. Yes, please.

6 MR. MIHELICIC: (inaudible) --

7 MS. DE LA TORRE: Yes, please.

8 MR. MIHELICIC: -- plug here. If you're
9 interested in more information on Defense
10 Information Systems Agency, we actually have an
11 excerpt from a recent magazine article in the
12 back. And also, please feel free to go to
13 www.DISA.mil to hear more about our mission, as
14 well as contracting opportunities, including
15 access to our bulletin board that we use to
16 acquire commercial broadband services.

17 Thanks.

18 MS. DE LA TORRE: Well, does anybody
19 else want to make a shameless plug while -- have a
20 couple of minutes.

21 Well, thank you all so much for coming.

22 It was extremely interesting. I know that

1 everybody who stayed was fascinated and I'm sure
2 that all of our online users are also very
3 interested and maybe some of your students are
4 actually listening.

5 So thank you very much for taking the
6 time to come out because I know we sort of planned
7 this quite hurriedly and we appreciate you coming.
8 So thank you, and thank you to the audience for
9 being here and for all of the staff for making
10 this happen. They really had to make it happen
11 very, very quickly. And so -- and we appreciate
12 the video that was made as well. I think that
13 really was a very nice touch.

14 So thank you everybody and thank you,
15 Anurag, for joining me.

16 (Whereupon, the PROCEEDINGS were
17 adjourned.)

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1 CERTIFICATE OF NOTARY PUBLIC

2 I, Carleton J. Anderson, III do hereby
3 certify that the forgoing electronic file when
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5 direction; that said transcript is a true record
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14 /s/Carleton J. Anderson, III

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