

MS. ZASLOV: Thank you for inviting me here to speak today. As chief of the auctions division, I'm really proud of all we've accomplished in just four short years since we got the auction approved from Congress. Auctions have proven to be an efficient way of allocating spectrum to those who value it the cost. Auctions have put spectrum rights in the hands of both large and small telecommunications providers across the US. We created opportunities for those who want to provide wireless surfaces to rural areas. About 53 percent or more of our auction winners have been small businesses, many of which are new entrants into the telecom market.

Since the inception of FCC auctions, we've awarded more than 4300 licenses to winners who are either offering or preparing to offer services to the public in nine different wireless and satellite categories. New services include Personal Cellular Service (PCS), Digital Audio Radio Service (DARS), Local Multi Point Distance Systems (LMDS), and 800 megahertz SMR services. So whether you are a telecommunications provider or a regulator, these are certainly extraordinary times.

It doesn't seem very long ago -- okay. Maybe it was a long time ago that I was watching George and Jane Jetson on TV, and wondering if I would be flying my saucer while talking on my wireless wristwatch phone in the year 2000.

If we fastforward to today, I can tell you that in two years, I'll be still driving my Acura Integra, but in just two months from tomorrow, Motorola and other investors plan to introduce global satellite services worldwide using Iridium, 66-load orbitum satellite constellation. The Iridium system will allow customers to reach virtually anyone, anywhere in the world.

So, for about 2500 for the terminal, plus air time, I could easily fulfill my childhood dreams of emulating the Jetsons. Surely, with all this new technology available, we must be living in the age of communications and information. Unfortunately, reality does not parallel the Jetsons cartoon show.

According to the International Telecommunications Union, for example, most people in the world still do not have access to what we call plain old telephone service, POTS. Put another way, more than half of the world's population has never made a telephone call.

Compared to much of the world, the United States' average penetrate rates of 90 percent or more look great, but looking closer at the numbers, we find that many people in rural areas, and some urban areas, do not have access to telephones and advanced communications, as we might believe.

Yet it is difficult for many Americans to comprehend the very real hurdles that rural Americans, and particularly Native Americans, face every day when it comes to securing adequate or any advanced communications services.

Commissioner Tristani and others have mentioned the 1990 census bureau statistics that suggest that the majority of American Indian homes or on reservations did not have a telephone in the early '90s. is was true for only five percent of all households nationally.

Given these kinds of statistics, it's clear that America, like the rest of the world, is becoming a country of haves and have nots. And the gap between the two is growing exponentially, as access to the Internet, wireless, and satellite technology emerges in mostly the urban and wealthy parts of our land.

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Next Workshop, February 22-25, 1999, San Diego Town & Country

How do we assure access to telecommunications for all Americans? For the have not's, advances in technology may still provide an answer to the telecom gap. The development of new wireless technology, cable and satellite services may help areas with limited wire line infrastructures leapfrog over those with older, copper line, labor-intensive systems.

In places where the wait for wire line services may be years because of a lack of interest or resources, these services may be able to provide telecom services faster to customers and offer needed telecom infrastructure to stimulate economic growth in the area.

In some cases, wireless technology can have a distinct advantage over wire line, particularly in rural or remote areas with difficult terrain, such as mountains or deserts. The cost of connecting a wire line subscriber depends on several factors. The farther away a subscriber is located from the central office, the higher the infrastructure costs to connect them. These infrastructure costs will vary depending on how many customers subscribe, because costs have spread over the subscriber base. Thus, the lower the population density, the higher the cost. Areas with rough terrain, rocky obstacles, mountains, large lakes, et cetera, can also substantially increase installation costs.

In other cases, wireless technology may be more economical than wire line, in areas where wire line infrastructure is very limited. For example, according to one analyst, wireless networks cost about a third of wired networks, and they can be built in a third of the time. It may be much cheaper and faster to build out a wireless network than to put in an entirely new wire line network where none has existed before. In areas with some wire line, we may be able to extend the reach of a limited and expensive wire line backbone to less populated rural areas.

So, what is wireless local loop? The local loop refers to the twisted copper wires connecting the local exchange carrier, the LEC, to an individual's home. Most often, it completes the so-called last mile, connecting the home or business to a local switch operated by the LEC. The wireless local loop replaces wire with radio signals to provide telephony and other services.

There are currently two basic models for wireless local loop. The first is fixed where the customer-premised wire remains in place and the last mile is provided by radio. With the second mile, the caller is at a fixed location and the LEC maintains the radio service to its local switch.

Wireless local loop services have been available domestically for a number of years through such services as basic exchange telecommunications, radio service. Also known as BETRS, better allows certified LECs to provide wireless local loop service to high-cost rural areas.

Other operators with plans to offer wireless local loop more generally are AT&T, Winstar Communications, and Advanced Radio Telecom Corp and Centennial Cellular Corp. There are other wireless technologies that may be available to rural and reservation use, such as those found in the 220 megahertz spectrum, which is predominantly used for dispatch services.

The FCC has announced that it plans to conduct an auction for those 220 megahertz licenses on September 15th. Another technology for which the FCC has recently auctioned licenses is LMDS. We

anticipate that the uses for LMDS licenses will include services such as Internet access, fixed telephony, and video programming.

Nextband Communications, WNP Communications, and Winstar were the top three bidders in that license. The nation's only existing LMDS operator, Cellular Vision USA, currently offers multi-channel video services and recently began to offer Internet access in the New York area. Of course, it would be impossible to discuss wireless technologies such as LMDS or 220 without mentioning the overall dramatic changes in the wireless telephony market.

This market is in the midst of an important transformation. Prior to 1995, the industry consisted primarily of two cellular providers operating in each market. And PCS has transformed that. Since then, the Commission has allocated additional spectrum to the auction for up to six new broad band PCS licenses in each market. The Commission auctioned these licenses in several blocks, in the A and B blocks, the C block, which was set aside for small businesses and entrepreneurs, and the D, E, and F blocks, as shown in this slide.

Today, many of the PCS auction winners are already offering services across the US. As you can see from the map on the next slide, there's broad band PCS services for about 82 percent of what we call the nation's total pops, or population within geographic areas licensed to wireless suppliers.

Nearly 70 percent of our basic geographic training areas have one PCS operator, 63 basic training areas have two operators, and 13 have three operators. Now that I've given you a preliminary sketch of new wireless technologies that are or will be available to the public over the next few years, the question remains: Will these technologies reach rural and Native Americans?

In the past, the FCC has used several different ways to give small businesses, rural telephone companies, and minority-owned businesses a chance to participate in the provision of spectrum. The Commission has used installment payments, bidding credits, and for the broad band PCS auctions, what we call the entrepreneurs block, or C block, as I mentioned before, which sets aside spectrum for bidders not exceeding certain financial thresholds.

Recently, the Commission has largely focused on helping small businesses. Two 1995 Supreme Court rulings raised legal uncertainty as to whether special auctions provisions for minorities and women could withstand the Constitutional challenge.

Consequently, the FCC has tried to encourage small businesses and rural participation by allowing auction winners to partition or disaggregate certain types of licenses, such as PCS, LMDS and 220, to name a few. This means that a company that has won a PCS license for services covering a large geographic area can sell off portions of their service areas to smaller companies. In addition to partitioning, the Commission allows entities to disaggregate a portion of the spectrum assigned to a license. This means that the winners can assign discrete blocks of spectrum to another qualifying entity.

Although entrepreneurs and small businesses can qualify for special loans, spectrum set-asides, or other considerations in certain FCC auctions, they must still keep in mind that winning a spectrum license requires not only significant financial resources, but also, the ability to build out a system within a specified period of time.

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Native Americans do have an advantage over other participants in that they are exempt from FCC affiliation rules because of their legal status. This means that revenues of Indian Tribes, with the exception of gaming revenues, are excluded from determining whether Indian Tribes are eligible for small business bidding credits in the auctions.

It also means that entities that are owned and controlled by these Tribes will not be considered an affiliate. That is, the gross revenues won't be counted if a Tribe becomes an auction applicant or a licensee. To give you an idea of the different steps that you must go through to participate in FCC auctions, I'd like to generally outline how the procedure works.

The first step is that the FCC releases a public notice requesting comment on specific auction procedures for a specific auction. Some of the input that we want is what is the appropriate amount for a minimum opening bid? Is a minimum opening bid appropriate for this particular auction? What is the appropriate amount for an up-front payment?

Once we collect those comments, then we issue a public notice that announces the auction date, auction procedures, and deadlines, particularly the deadline to file what's called a short form application to participate in the auction.

Each party who's application has been accepted by the Commission must make an up-front payment in order to be eligible to bid at auction. This payment ensures that only serious bidders participate in FCC auctions, and it also provides a source of funds from which the Commission can collect any penalties that may accrue during the auction. The amount of the up-front payment applicable to each license is determined prior to each auction, and a bidder's maximum eligibility to bid in the auction is based on the amount of the up-front payment.

If the bidder is the winning bidder for a license, this up-front payment is retained and applied to its down payment on the license won. If the bidder is not the winning bidder on any licenses, and has not incurred any bid withdrawal or default penalties, the up-front payment is refunded. Although bidders do not receive interest on the up-front payment money, that interest goes into the telecom development fund, which provides loans to eligible small businesses seeking entrance into the telecom marketplace.

Winning bidders are then announced by public notice shortly after the close of an auction. Once the auction is closed, and the high bidders are announced, the winning bidders generally must submit a down payment on the licenses won within ten business days. Shortly after making this down payment, each winner must file what's called a long form application, which is the actual application for the license. If the application is acceptable to the Commission, and no opposition is filed, the license will be granted, conditions on payment of the remainder of the winning bid.

Now that I've outlined the procedures, I'd like to share some lessons learned that the FCC has gleaned from our past 16 auctions over the past few years.

First, secure financing early, and have a sound business plan. Needless to say, there's nothing more important than this to be a successful bidder in an auction, and nothing can be more damaging for a bidder to get into the auction and then be squeezed out of the market because its up-front payment didn't

afford the bidder enough flexibility to change markets. The up-front payment is the only method by which the FCC can assess the potential bidders' seriousness.

Secondly, become very familiar with the auction rules and procedures. And as my staff likes to say, read the rules, read them again, read them again, and then give us a call.

Thirdly, don't let unauthorized bidders place bids. If an auction lasts a while, bidders can get complacent, but we tell people that round 110 of an auction is still just as important or more important than round one. Don't get complacent. We've had authorized bidders let their associates or secretaries or spouses place bids, with somewhat drastic results.

Practice with a bidding software prior to an opening day of an auction. Since the auctions are conducted electronically, all bidders bidding electronically should become as familiar as possible with the software, as well as the rules, before the auction starts.

We always hold a bidders seminar about three weeks before an auction, to answer bidders' questions, explain the service rules, explain the auction rules, and to get them as familiar as possible with the auction software. About two to four days before an auction, we hold a mock auction where the bidders can actually practice with the software.

Since bidding electronically isn't second nature for most people, bidders have to become familiar with it. But once it does become second nature, it offers the advantages of instant feedback on round results, bid confirmation, and instant access to all auction and bidder information.

Submit bids early in the round, and maintain backup plan in case of technical difficulties. Any number of things can happen when you go to an electronic system, as we have, whether it's inclement weather, a computer crash, or a dead phone connection. Bidders should keep a laptop ready or have authorized alternates place bids. Bidders must be able to bid by telephone if there is an electronic problem on the computer.

Double-check your bid carefully before hitting the submit button. This may sound instinctual, but it isn't necessarily, and some bidders have placed wrong bids, erroneous bids, and asked for waivers when they had to withdraw them. There's a stiff penalty for withdrawing the high bid, which is the difference between a withdrawn bid and what the license ultimately sells for, which may be a lot lower.

The reason is that the FCC takes seriously any gaming of the system, such as purposely bidding up the license and withdrawing, as an anti-competitive tactic. And finally, keep the main telephone numbers handy during the auction process. You will need them to place bids by telephone, if that becomes necessary; to call our technical support people to have legal questions answered, and to find out how and when to make payments or get refunds of up-front payments if you drop out of the auction.

There have been a number of Native American auction bidders over the past 16 auctions. As many of you already know, Cook Inlet Western Wireless is a partnership of Cook Inlet Region Corporation and Western Wireless Corporation and other investors. This partnership successfully bid in the FCC's broad band PCS C block auction, which allocated set-aside spectrum.

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Cook Inlet was one of the first PCS licenses in this auction to launch its services in a major market, Tulsa, Oklahoma. Cook Inlet Region Incorporated is an Alaska Native corporation owned by approximately 6900 Alaskan Native shareholders.

Another small business, Airadigm Communications has partnered with the Oneida Tribe of Indians of Wisconsin to win PCS licenses. Airadigm not only offers PCS services to numerous rural areas in Wisconsin and Iowa, but also provides cutting-edge technology on the Oneida reservation.

Airadigm has five communications towers on the reservation that provide wireless local loop services to both individual homes, as well as businesses. Airadigm calls this a virtual PBX system.

As I mentioned before, the 220 megahertz auction will take place on September 15th, and we've recently announced an auction for public coast stations, which provides ship-to-shore communications, which will take place on December 3. An auction for LMS, which is location monitoring service, a vehicle tracking system, is also scheduled to take place before the end of the year.

I encourage you to explore our web site for up-to-date information on auctions and wireless issues in general, and the next slide provides the address for our web page.

Well, even though my childhood dreams of flying saucers may not come to pass by the year 2000, many of you at this conference, hopefully, will be well on your way to providing cutting-edge telecom services to rural America and Native American reservations.

I hope that some of you will discover the advantages of wireless technology for remote parts of the US, and perhaps bid for spectrum rights to provide new wireless services in some of our upcoming auctions.

Maybe when advanced telecom services have reached the rural and underserved areas of America, the age of communication and information will have truly arrived for us all.

MR. WILLIAMS: The Cheyenne River Sioux Tribe has been involved in the business for 40 years, and find it interesting that 16 auctions have taken place. Native Americans have joined up with other entrepreneurs to become involved. There's such a lack of understanding and knowledge in Indian Country as a whole. We could probably do a survey, and there would be many, many, many tribes that would be totally unfamiliar that the air space over their reservations has even been auctioned off, which generates billions of dollars for the United States government. I liked your presentation, and maybe Tribes can use it in the future, but I just offer that many of us did not know that some of this took place.

We in the telephone world did, but many of the folks that are from Tribal governments, and their respective jobs, this is all new to them.

MS. ZASLOV: Well, I think that's right, and certainly we would be happy to take any suggestions that you may have, particularly in our upcoming notice of inquiry, about how we can get the information out. Obviously, if you don't have phone service, you don't have Internet access, so we can't say, you know, people should check our web site. We would be interested in your thoughts about how we can better communicate what we're doing. Yes?

MR. NEISS: Rosebud is looking toward acquiring cellular phone service.. We have jurisdictional rights to air space, yet our air space is being auctioned off. We just can't really conceive of this whole concept, of selling our air space, you know, that kind of bothers me.

MS. FLOWERS: Do you feel like it's going to get saturated, though? I have a cell phone, and get knocked off the air, and you get other people's conversations. Do you think there's going to be a time where there's going to be a saturation point? There will be too much out there?

MS. ZASLOV: A licensee doesn't make money, there's no particular market, so I don't think you would get to a point where you have too many licensees

But it definitely there is an opportunity to try to compete. People might have thought, oh, two cellular providers per market is enough. But not necessarily. The prices were in a lot of markets, very high, until PCS providers came in, and the prices were shot down by 10 to 20 percent..

But I think that the concern about saturation will -- you know, the market will correct itself in that regard. Yes?

PERRY HADDON: TVCON Rio Vision. We were a bidder in the 28 megahertz LMDS auction, and the 38 gigahertz. An observation about the auction, and it really has a lot to do with people in this room. Those of us who wanted spectrum in rural areas, came in with a business plan, and we came in with the idea of getting the spectrum that we wanted.

What actually happened during the bidding process is many of the large companies interested in the very largest markets had a strategy of bidding on their high markets. Then they took the time to regroup, and to decide how much more they could bid. They would be disqualified if they did not bid. But they needed a little extra time. They would do what we call hideout, or keep their eligibility by hiding out in areas where the costs per pop was less.

They had computer programs that would tell them that the cost per pop. In Prescott, Arizona, it was very low, so then they bid in that place, knowing that they had no intention of ending up with that license, but just keeping their eligibility up.

The final result is those of us who got those rural markets ended up having to pay a great deal more for a market than the population density could support. I think that there needs to be some work done to figure out how the rules could be modified to help those of us who were after the smaller markets.

MS. ZASLOV: I understand exactly what you're saying. We call that parking eligibility.

MS. ZASLOV: One of the rules of the simultaneous multiple-round auction is that bidders are required to stay active on a certain number of licenses throughout the auction. That means the reason for that is so they don't hold back their bids until they see what everyone bids, and then bids. That's why, in some cases, they may not be really interested in the license, but they're going to lose their eligibility unless they bid on something. And unfortunately, it does have the disadvantage of driving up the price that would otherwise be paid by someone who is interested in the auction.

I don't know exactly how you correct that without having the disadvantage of no activity rules at all. There were 122 licenses in that auction that did not sell and most of those are mostly rural areas. We intend to conduct a reauction of those licenses, probably early next year. So, there may be, you know, another opportunity for different markets, where hopefully, you wouldn't come up with the same problem.

MR. ARTMAN: If it makes you feel any better, when we were dealing in the PCS auction, we actually parked in the larger bids, because we didn't want to have the bigger people involved in our rural bids.

The last panel is a group of wireless companies that will discuss how wireless systems can enhance or improve the condition of our services in Indian Country.

- **Carl Artman**, Executive Vice-President of Airadigm Communications
- **Rhonda McKenzie**, President and CEO of McKenzie Telecommunications Group,
- **Joe Madebeg**, Qualcomm
- **Diane Del Rosso**, President and general manager of the Southwest Region, PCS Plus
- **Ron Wells**, Project Development Specialist, Black & Veatch, Telecommunications division.
- **Perry Haddon**, TVCON Rio Vision

MR. ARTMAN: I'm Carl Artman, executive vice-president of Airadigm Communications. I'm also a Tribal member of the Oneida Tribe of Indians in Wisconsin. Before I get started, how many of the Tribes represented are currently in wireless communications in some form? Two? Three? How many Tribes want to get into wireless communications? Good, from what I see.

It's good one to follow Amy's speech, because she gave an overview. I would like to make a minor correction on the C block auction, which she reference as for small businesses. Indian Tribes were part of that, and it was really a great opportunity for smaller entities to get involved in the wireless world.

Of the 89 people that finished the auction, very few so far have been built out. Of the few that have been built out, I am very proud to say that the first two to turn on the markets were both Indian-owned, or at least have an Indian partner, Cook, in this case.

Airadigm is primarily owned by Oneida Tribe of Indians in Wisconsin, and the small fact that the owner of the president of Cook Inlet and myself always debate. We actually turned on our markets first, six months before them. They turned on a major market, we turned on secondary markets, so you can see where our heart is.

Besides the Oneida Tribe, other Airadigm Communications owners, are investors. We serve primarily the Wisconsin areas, with a little bit in Iowa. We are a PCS provider, personal telecommunications services.

When Oneida decided to invest, the Tribe saw benefits for a number of reasons. From a macro perspective, the Oneida Tribe saw it as a way to enhance their own telecommunications services, to become involved in telecommunications, to set their own destiny in that world without having to pay homage to the three local exchange providers which served their reservation. Or rather underserved their reservation. A better way to say it is not having to pay homage to the cellular companies, which in large part skip over the reservation.

We saw this as a way to bring wireless services, advanced services to their Tribal members. They saw it as a way to start pushing the technology, getting into concepts like wireless local loop. To date, we had only been familiar with cellular communications as an adjunct or a supplement to wire line communications. You had seven different numbers.

With PCS technology, they saw this as an opportunity to start experimenting with the one number concept. And finally, and probably most importantly for Oneida was the ability to create jobs on the reservation for the Tribal members.

The Airadigm offices are located 20 miles south of Oneida. About 15 to 20 percent of our 110-person staff is made up of Oneida Tribal members, and we're always increasing that by offering to send Tribal members to apply for engineering jobs. They usually go to Dallas to be trained by Ericson for RF engineering positions - that is how to deploy sites.

From an economic perspective, Oneida saw this as a method to not only reach internally, but also to externally, beyond the reservation boundaries. This is especially true for gaming Tribes where public relations is very difficult. to bridge that gaming face that you've been given by your Governor and the legislation.

By creating Airadigm, Oneida was able to take a business, a service beyond the reservation and sell service to everybody else in the state, to compete head to head with Fortune 500 companies like Mineco, Sprint, MCI and AT&T. So you can either be in Green Bay using our telephones or you can be 20 miles away in Appleton, or 200 miles away in Madison and still be using the Airadign telephone by the Oneida Nation.

Oneida is able to branch out as a community and to other businesses in the nation, as more of a regional or local player. Through Airadigm, Oneida has other partners like Bell South, PacBell, and Western Wireless. Our marketing strategies and technology was based in part on the communications that we chose GSM.

GSM is a world technology, and this gave Oneida an opportunity to meet and work with people from Ericson and Nokia, from Sweden and to work with people from India and from Europe on how their telecommunications are being developed.

In large part, that's why the wireless local loop concept developed. Now we're fighting for something called calling party pays, which is also a very European method. We're one of the smaller companies out there battling heavily for that, because Oneida sees the vision in trying to get people to go wireless.

This has created a global attitude with tremendous ramifications locally. As companies look at Oneida and say what are they doing, as a geographic entity. Can I place my business there? They see this action and they know they are working with a global companies. They see infrastructure which is being developed on the reservation, and they're saying, fantastic. Let's move there.

I think West Virginia provides a great example of how infrastructure can lead to business opportunities for a particular geographic area. Two decades ago, they had barely any telephone lines. Now they have the more fiber optic per person of any state in the union. Since then, businesses are running there, flocking there -- 800 services or customer service oriented businesses, catalog orders, etc. They're flocking there because of the low taxes and the high technology.

The same thing is occurring now on the Oneida reservation. High-tech companies such as Plexus, which is a second-party manufacturer, ONE which is Oneida's high-tech company, and some of the peripheral

companies that are coming off of that are coming to the reservation to establish themselves, to establish businesses on their own.

A quick overview of the personal communications services. It's digital. It's not analog. It provides better voice clarity, and security. In fact, it's probably the most secure form of communications out there, no matter which digital technology you choose. It's so secure, that Congress has to introduce a special law in order to allow the law enforcement to tap it. It still is not solved, how you get into a digital wireless service.

Since it is digital as well as broad band, it provides a tremendous foundation upon which to build future technologies and services. Things that we can only imagine.

Amy was talking about the Jetsons. Maybe some day we'll have video on our telephones. We'll be able to hook up our handset, or the wireless airways will be our cable connection for our television.

But as we look towards the future, and the reason why Oneida went into PCS, went into the 30 megahertz, went into digital, the one thing that was always paramount was the fact that band width, going into the future, will be the key.

Digital will die, the way telecommunications is going. It's been that way since 1993. 1993, with the advent of the auctions, what really signaled the death of analog technologies. They'll only be there to support and offer the very low-end services.

Wireless will replace wire line, eventually, for many, many services, as the people demand mobility.

In our market, for example, we're replacing wire lines in homes and businesses. Oneida is a beta test site for the new technologies. We are replacing the phones in homes and businesses with wireless. Consolidated Papers is a great example. They make a lot things - napkins, toilet paper, whatever you use every day, but just you have don't see their name on it. They're just as big as Kimberly Clark.

Over the next three years, we're going to be introducing thousands of telephones into their manufacturing facilities. Three campuses that span over a 45-mile radius. We're going to be replacing all of their wire line services.

They will have wire line in there only as a backup to wireless. Prior to that, sometimes wireless was used as a backup. And now we're taking the front and center position with them.

Data communications. People are going to want to take their telephones and hook them up to their PDAs and surf the web. They're going to want to put it in their car. If you think driving on the highways is bad now, wait till you add those kinds of things.

Salimetry. The Oneida Tribe, Airadign Communications, and a group called Electric Utility are working together to bring salimetry to the market. What we're doing is putting monitors on electrical monitoring devices that the electric company uses. We can tell them what the usage is in a particular area.

Imagine the cases that you might have, for example, in Alaska. I'm sure the meter reader doesn't want to hop on the plane, go out to the bush, get back on the plane, and come back, just to tell them how much they pay. With wireless applications in salimetry you can do that remotely. Vending machines. We're having talks right now with a local soda distributor, vending machine company. Put devices on there to tell them when the soda is low, how much money is in there, how much quarters, nickels, and dimes is in there, and what he'll need to replace. Again this all done remotely.

The application that most affects people is telemedicine. We're working with the Oneida Tribe Healthcare Center to deploy telemedicine applications onto the reservation. And as we deploy it onto the reservation, we think that's going to be the model for the cities and communities surrounding the reservation, and they may even take advantage of those telemedicine capabilities.

We're going to be outfitting nurses, healthcare providers, doctors, and EMTs and police with the ability to do - apply medicine, or cure an individual or stabilize an individual real-time, on site, without having to worry about whether or not there's a wire line capability.

With the broad band you can send more information than you could over a walkie-talkie. You can actually send vital statistics, data readings, and still have voice communication with a broad band. I'm looking forward to see how those all pan out, because it's amazing some of the stuff that we're dreaming up to put on the reservation.

I was going to talk about how it all begins with the auctions, but Amy did a very good job with that. You have the auctions, you design engineering and then you the build-out. Before you can ever get out there, you need to market the product. From our perspective, we'd rather go through 20 build-outs than have to market our services to customers where there are six competitors in a marketplace.

One of the things that the Oneida Tribe looked at when doing that was very carefully figuring out who was going to be the customer. What would be our niche? Probably about 65 to 75 percent of our business comes from business-to-business applications.

We do sell to consumers, we have retail outlets. In two weeks, what's called a Nargez store, which is our E commerce site.

It's easier to deal with one business than 200 single consumers. Business are the ones who want to see the virtual PBX. They're the ones who can take advantage of the broad band capabilities right now. This will filter down to individuals, but it's the businesses and communities such as Oneida that can take advantage of virtual PBX, call transfer, call hold, conference calling, like you would with your desk - telephone. But the difference is mobility with it now you could be in Wausau, Wisconsin, Green Bay, Wisconsin, New York City, Hong Kong, or London. Wherever we have roaming, we have that capability.

Now, the office is no longer where you're sitting, in the queue, it's a virtual office. If your phone number follows you, that may be good or bad, depending upon where you are in the organizational hierarchy.

MS. MCKENZIE: Thank you. First of all, I'd like to thank Paulette Hansen for the excellent coordination, and the invitation to attend this. It's really a blessing for me to have this opportunity to

share the 24 years of telecommunications experience that I personally have, and to be able to invite my colleagues, who are also extreme top industry professionals.

I'd like to tell you a little bit about my panelists that I invited to come here to share information with you, to help you understand what is available to you.

We're not presuming that we have a full understanding of what your particular needs are, but we have a variety of solutions that are available today that will provide incredible economic development opportunities for you, very rapid telecommunications systems within your reservations, for telemedicine and distance learning, and digital voice quality telecommunications systems.

This panel are top industry experts in the wireless technology. CMA, GSMA, GSM, TMA, and I won't get too technical, because I know many of you aren't familiar with this but if you're interested, please talk to any one of us.

We've participated in several auctions. The LMDS, the PCS, the 38 gigahertz, the WCS. We know the auction process. We have three licensees that are successful winners, who have put together successful business plans, have participated in the auction, and all of the computer crashes, et cetera, in the FCC process, and are very proud to say that we understand the FCC auctions, and they really have made it pretty simple, once you go through the bidding process.

I want to tell you something that's very unique about this group, probably the most important factor is that this group combined have been responsible for developing wireless communication systems, not only here in the United States, for Third World countries, like the Philippines, Sri Lanka, the Philippine Islands, India, China, and Mexico.

One panelist has a video that illustrates the vision of a Mexican company for rural communities. It integrates PCS and LMDS technology and bypasses copper and fiber completely. I am speaking about Mr. Perry Haddon, who represents TVCON Rio Vision, a Mexican affiliate which is also located in the United States. They have an American entity and several licenses in southern Arizona, New Mexico, and California.

Joe Madebeg with Qualcomm, who is a true network expert, who works for Qualcomm, and also has worked for several other companies in the industry designing networks of every sort that you can even imagine.

I own MTG. I am a systems integrator. I find the fiber with the wires and with the telemedicine and the distance learning equipment. I kind of put us all together to make the recommendations.

Diane Del Rosso, who is with a PCS Carrier, covering several points in the western part of the United States, is a licensee who is willing to discuss partitioning, or disaggregation, in working with Tribes, switch sharing.

We also have Ron Wells, who will provide a very critical portion of this session in how do you get a system in a rugged terrain location, a far distance from metropolitan area where central offices are located.

So, with that, I'm going to start with a very rapid presentation --I want to give the other panelist most of the time.

There's a case for wireless technology. Basically, we need to be able to provide Internet access to all parts of the nation and that includes the Tribal reservations. Congress has provided funds for provide discounts for schools and libraries on all communications services. So anything that's coming in from metropolitan areas through switch sharing or the main hybrid systems like fiber optics coming into the reservations are coming at discount rates. From there you can create your own systems.

By law, you can purchase portions of PCS or LMDS wireless spectrum. We have three licensees represented by this panel. Our licenses cover some Tribal areas. They are willing to work with you, to become your partner, partition a section for your Tribal section.

You can lease the spectrum, or you can buy it. You can switch share with them and save ourselves about four million dollars on a switch, and have a very cost-effective system, 911 service and immediately have global networking capability. We have open competition with local exchange carriers and long distance carriers by providing your own telecommunications system.

What does this mean to Native American Tribal communities? You can have quick, cost-effective voice communications, telemedicine, distance learning applications, into Tribal lands, via wireless technology, very quickly -- within one year you can have a system up and running. This will improve medical care in rural clinics and hospitals. It will improve education via transmissions of classroom seminars conducted from remote locations, such as educational system training.

That would mean like in a metropolitan area, a university can bring a live classroom session into a reservation through the LMDS system, which would be co-located with the PCS system. The other opportunities that you could create is a National Native American telephone system. If you all wanted to link together, or a local telecommunication network comprised of PCS and LMDS systems.

For those of you that don't know the difference between PCS and LMDS, PCS is at one spectrum frequency, two gigahertz, 1900, and LMDS is at the 28 gigahertz. It's a higher frequency with more band width, meaning that you can use that frequency for high-speed Internet, video conferencing.

That would be predominantly your telemedicine, distance learning on LMDS, and your PCS would be your digital voice and lower-speed data transmission.

Another great opportunity is by owning and operating your own system. Joe from Qualcomm will get into this along with the opportunity of being trained.

Your people can be trained on your reservation to own and operate, maintain your own system. You'll also be trained how to open your own customer service centers, your retail source, so that you can generate revenue in many ways, rather than just the air time revenue.

You can work out agreements with your contiguous carriers, with roaming agreements, where when they are generating revenue while passing through the State Highways or the Interstate. You can be getting that revenue, rather than the other carriers, or you can share with the carrier, if you're working that type of an arrangement for switch sharing.

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It's possible to create a complete digital telecommunications system within one year, providing digital voice service for the reservations. You can integrate them later. The high-speed communications systems which could provide you the high-speed Internet equivalent to asynchronous transcript mode.

If any of you are technical, the ATM, ISDN, or the sonic rings, telemedicine at 384, which is very high speed. On Monday we were at the telemedicine conference illustrating a telemedicine video monitoring, and teleconsultation devices of transmitting images to distance experts.

Also, there's distance learning. The potential in distance learning is probably the most exciting. We can establish parity in education on the reservations with the metropolitan's best private schools by building these systems. Probably that excites me the most.

The distance learning portion is live, interactive. The children, K through 12, can receive live training from some of the best quality instructors in the metropolitan area. Say you have a gifted group of children that are honor students, but you don't have the funds to have an honors teacher. Well, that child get that education that he or she may need through this distance learning process. And you'll watch the educational levels go up.

Also, in the telemedicine, this falls into domestic violence applications, where there can be real live monitoring of domestic violence cases going into the metropolitan areas, or your headquarters areas. So, there are a lot of applications there.

As far as education, here's an economic opportunity. Once you have the systems in place, your there is so much interest, by many portions of the world, not only the people within communities outside of the reservations, that are interested in the Tribal ways. And there are things that you could share with the people outside of your reservations. You can sell this and make revenue off this, create businesses, and sell it through the Internet.

Use your video conferencing, and then start educating maybe the universities, from your Tribe, or your clinics. And you can get universities to actually pay you to teach their classes from your reservation. It would be the other way educating, so education goes both ways. It's truly information sharing.

The next is medicine. Remote specialists, dialysis for diabetes, alcoholism. If you need specialists, you can actually have your clinic healthcare providers communicate face to face, real-time, with a specialist in a metropolitan area; without having to helicopter the individual into the metropolitan area and have regular dialogue.

The same thing with education. Your clinic staff can be trained from the universities and not have to drive a long way, or fly somewhere. They can actually receive that education right there, on their sites, through the distance learning, through the universities. And the universities are very interested in doing this.

Federal agencies are interested in bringing in education, and there is funding, according to the Federal GSA I've had two groups approach me already. They said if you have Tribes interested, we're ready, we have money. So, there's something that's worth considering there.

In education, the technology can help strengthen community building efforts within and between rural Native American communities via video conferencing - In other words, if you want to create a national - network- so the Navajos could conference with the Apaches, or with an Alaskan Tribe and share information.

Environmental protection is also a very critical thing. All of these systems can now be built and constructed in a very environmentally friendly manner. The towers can look like pine trees, or palm trees, or whatever kind of tree you like. They can look like rocks on the side of a mountain. So, we are very sensitive to the environment, as well as everyone else.

In economic development, Native American businesses and regulators can emulate or adapt mainstream uses of telecommunications, and Native-owned telecommunications are an important source of economic development and job creation.

Each one of these panelists will talk about how we will train you to do this yourself. This is the whole intent of this conference, as I was instructed.

There's a huge opportunity for you to become distributors for these manufacturers of telecommunications equipment. You can become a telecommunications and information services provider for tourism, retail, target markets, with all of these services.

There are several economic development opportunities that will be made available to you once you have this telecommunications systems on board.

In healthcare telemedicine systems, we need to use wireless technologies to meet the demands of weather, terrain, and remote locations on many reservations. The indirect savings might accrue through more effective and efficient treatment plans, and through early identification of health problems. And that's, for example, identifying diabetes early, other health problems earlier, because the mortality rate, infant mortality rate is very high on many of the reservations. Lives can be saved through this telemedicine.

We can reduce cost in healthcare by using telecommunications for both health and patient care. We can piggyback these systems and link them to each other, so that you have education daisy-chained of the primary infrastructure in telemedicine, so you can save a lot of money.

The computer networks could offer communities free and low-cost medical data bases, which is very important, and health institutions may benefit from communications with Native communities, conducting research on holistic medical methods.

The next person on the panel will be Diane Del Rosso, and she is a carrier covering several geographic areas in the western United States, that would be interested in discussing business opportunities with any Tribes that are within her territory. Thank you.

MS. DEL ROSSO: When I was riding down the interstate this morning from Santa Fe to come join you, I started thinking about how has telecommunications really had an impact on my life, and my work, and what I do, and economically, how has it changed my world, and environmentally. All these things that are on the slides.

I realized that for the last two years, I've had the blessing of being able to work at home, and I can sit -- and I can commute to my office, some 20 feet, and I get to sit at my computer and communicate via modem across the world, and across the street.

And at the time when all of that gets to be too much for me, I can get a hold of my dog and go take a walk out under the beautiful New Mexico sky. And so, I particularly am very blessed by what telecommunications have done to me personally.

And I hope the conference allows you the opportunity to get out and share in some of our blue sky and beautiful clouds, and the natural environment.

I'm humbled by some of Rhonda's comments on all of our expertise, and in fact, everything that I wanted to share today has already been said. And so, I jotted down a few points that I'd like to make, separate or in addition, or reinforcing some of those comments.

But before I do that, I thought I'd start with a riddle, and in order to keep with the spirit of New Mexico, I brought a prize for the person who gets the riddle, and it's a can of New Mexico's finest Hatch green chiles.

For those of you in this area, you know what a prize this is, and for those of you traveling from great distances, you can get together with some of us who live here now and learn some great techniques for how to prepare these chiles, in mouth-delectable ways that you will really enjoy.

So, the riddle is, What cannot be seen by the human eye, but is all around us? What is it that is constantly used, but never consumed? And what is it that some people think is a very big asset, valuable asset, but is always renewed?

UNIDENTIFIED ATTENDEE: Air.

MS. DEL ROSSO: You know, I asked this riddle to a friend, and the friend said air, and that would have been -- you're close.

UNIDENTIFIED ATTENDEE: Energy?

MS. DEL ROSSO: Even closer.

UNIDENTIFIED ATTENDEE: Electronics.

MS. DEL ROSSO: I'll give you a clue. Go back to the air, because if you've ever been to Los Angeles, you know it can be consumed, and sometimes you can even see it with the human eye.

MR. NEEDHAM: I live in Denver, and we can see it.

MS. DEL ROSSO: Good point. It fits the spirit of the conversations that were happening this morning by Amy, and what she was talking about. It fits with air and energy.

MS. FLOWERS: Air waves.

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MS. DEL ROSSO: Exactly. Electronic radio air waves. Who said that? I'm glad it goes to Alaska. Congratulations. That's wonderful. I personally like it best in scrambled eggs, but there's a whole bunch of ways to do it.

MS. FLOWERS: Thank you.

MS. DEL ROSSO: Congratulations. And if you have time before you get on the plane, you might want to pick up some of those Hatch green chiles yourself.

Amy, this morning, and to some extent Commissioner Tristani, spoke about air waves and electrons, and radio spectrum and auction processes, and no matter what else this panel speaks about today, that is what's common to all of us. That is what has created jobs for us. That is what has created some of what Commissioner Tristani works on.

That is the full basis of Amy's work right now, is developing procedures and processes for getting involved in, quote, leasing or owning the right to use, but not use up, this resource.

Because this resource is a national asset. It's owned by the public, all of us. And there were some comments earlier today that were well put, and I personally agree with some of what was shared by the Rosebud Sioux Tribe.

There needs to be a better system for involvement in claiming some of that resource.

Back in the '60s, the FCC took some of this spectrum that was being utilized by television, and they reallocated it to the concept of mobile use. And that was in the '60s, and it took some 20 years for that same idea to come to a reality in what we now know as cellular telephone.

And I saw some hands of at least three people here are operating a cellular phone system. So, in the '60s they said let's take some of the spectrum from television and put it to cellular. They didn't auction it then, they pretty much gave it away through a lottery process, and there was what's called the duopoly of two service providers for that frequency.

Then, in the early '90s, and maybe Amy was involved in some of this, they took some of what was allocated to microwave operators, and reassigned it for what's called this PCS, which has already been defined several times as advanced cellular, more data-oriented -- smaller handsets, better use, two-way data applications like a portable fax..

What if we take it from microwave and we give it to PCS? And this time let's auction it, because we want to try to do something to offset our budget deficit. Well, that was a great idea, and that was early '90s. And as it was already pointed out, a lot of those systems are already deployed, so you can see the cycle time has gone a lot faster. In other words, the manufacturers, like Joe's group, are ahead of the spectrum auctions. And so, it's mind-boggling how to even keep up with it.

I guess what I want to say about all that is that Rhonda has mentioned the possibility that exists with carriers affiliating or partnering with Tribal Nations. Amy mentioned that there are ways to partition, or disaggregate. Those are big words that basically say we could take some of what we had the good fortune to bid on and win and share.

And we could take a certain area through partitioning, and say, you know, we may not want to cover this area. Do you want to cover it? In which case, you could take over that license.

That would be called a geographic partition. The full range of that spectrum, however big it is, depends on what that carrier purchased.

The other option that Amy discussed, and so did Rhonda, was desegregation. You know, maybe what we bought is more than we need for what our business plan says we want to do.

Maybe you'd like to take a chunk of it for that whole territory, not just your area. A broader area, and get into the same kind of business we're planning to get into, or Carl has gotten into.

The rules came out of the FCC, and all of that regulatory involvement was important in the old days, because it brought basic telephone service to everybody in America. Or that was the dream, at least.

You've also heard both from Commissioner Tristani and from folks in the audience that teledensity is nowhere near the 94 percent that the government is bragging about. In fact, there's folks that you're representing here in this room who aren't getting that service. I'm embarrassed to quote a percentage of 40 percent of the homes in Native Tribal lands and Native Alaskan lands are not getting it, because I suspect it's even a lesser percent, as you've all pointed out.

Why is teledensity so low on Tribal lands? I was thinking about that as I was sitting in the back of the room. And I heard somebody talking about it, and it's clearly a bottom line issue for businesses. And I think even Carl mentioned that.

You know, business-to-business makes sense, but stringing these out -- for wire companies to string out these lines, the costs far exceed the revenue. Can't afford to do it.

And I didn't want to presume to know the answer, so I also assume that it's not part of your vision; that at the point that it does become part of your vision, I'm confident it will become a reality.

Even making that part of your vision is a complicated affair, just because you've heard all these talking heads share all these areas. It takes time, it takes study, it takes dialogue and discussion, and learning about what people in your community want, what exists, who can I partner with, who do I want to partner with, where do we want to end up?

One of the things that is often touted, and I'm about to tout it myself, is this idea of economic development. And all of the examples have already been shared with you. And so, I've jotted down a few, and I'm going to skip the ones that have been shared, because I'll spare you.

There was a recent Time or Newsweek about the changing world of the shopping mall, that was on the cover within the last two weeks. The article said that today, 80 billion dollars a year is spent in E commerce. And within the next four years, that's projected to hit 300 billion dollars.

Has anybody ever bought anything over the Internet? Okay. Joe. Alaska has. Great. I haven't. I'm still one of these types that doesn't feel comfortable giving my credit card out over the telephone, over the

Internet. But I know in the next four years, I'll probably be contributing to that, because I'll -- because I'm getting more comfortable with it personally.

And so, the opportunity, as Rhonda mentioned, to market and sell Native products to a global market and, to participate in a changing view of how sales and marketing happen. Finding these connections are going to be critically important.

I think it was Commissioner Tristani who emphasized the point about bridging infrastructure, telecommunications infrastructure. And it doesn't stop there. It's utilities, it's water, as you pointed out in your brainstorming sessions yesterday.

All of that has to come together into your communities' vision for the future, and how you can connect to the world and share your resources.

It wasn't affordable then for wires to come in, the bottom line couldn't make it work, what's different now? How is it different now, that we can do this kind of thing?

Ms. Zaslov pointed out in her presentation about the concept of a wireless local loop, and I think she defined it, and it's basically a way to connect from the home in your town or in your Tribe, to connect from that home, via air waves, radio waves, to the public switch telephone network.

The basic system is a handset on your desk, and Joe is going to get into this in much more detail than I, because his company, as do others, manufacture them. But it's a handset with like a little antenna on your desk, or in your home. And through air waves, it speaks to a base station, kind of like the old cellular towers, and through some microwave configuration, it goes down to a base station control, which is kind of like a mini switching thing that speaks to the public switch telephone network.

Now, through all of that, you don't need to partner with me, or anyone like me that you choose to partner with, because that's a self-contained system. All I have available, as a resource, as do other people, and as you might yourselves decide to purchase, is the spectrum.

But at the point where that kind of system grows, and you need more advanced services, and more different types of customers say I have my wire phone connection now. Then you might need to partner with some folks -- you could do it yourselves, but the expenses are very high, to cost share on a switch.

They're high for me, as I look at them because I'm in the entrepreneur's block. And so, we could work together on sharing the expense of operating, upgrading to a bigger switch that we could both use, if that fits the vision that you took the time to work with your community to evolve.

There are other ways we could do that. But I think, at this point, if Joe would go into more detail about all the different pieces of that, that will help draw out the picture a whole lot better. He's going to explain how this whole system fits together.

MR. MADEBEG: I will cover some basic things. First, how does a wireless mobile loop system give you flexibility? It allows you flexibility to offer both basic and advanced services when you want them and where you want them, but flexibility is the key that you get with wireless local loop.

Now Carl had a show of hands of who is involved with cell companies and wireless cell companies. Let me ask you, who is involved in the initial business plans to look at the cellular network? Out of you people out there, how many are familiar with radio frequency engineering concepts?

A couple of you out there. Okay. This is a more general question. Who out there is a baseball fan? You got to love those Padres this year. I'm from San Diego.

Let me first apologize for my first slide which used several acronyms or alphabet soup. The acronym CDMA, stands for code division multiple access, and that's a technology that basically let's you put information onto the electromagnetic spectrum, and it's a technology that is the foundation of our company. Our company has gone ahead and commercialized that technology.

We have quite a bit of intellectual property, we've commercialized that into integrated circuits, into infrastructure equipment for cellular networks, for truck tracking systems, and satellite systems.

We're participants in the global star consortium putting up a lower orbiting satellite network for telecommunications. The key right now in the growth of our company is we've been around for about 13 years. We're now at 3 billion dollars. But the heart and sole of our company is wireless communications, right now, for mobile communications networks.

We build a lot of infrastructure equipment, the base stations, and handsets. Our company has built about 5 million CDMA handsets throughout the world.

When we look at where is growth opportunities in the wireless industry, we look at it in terms of wireless local loop. Wireless local loop, we see as being a big growth area.

A lot of carriers right now are preoccupied with rolling out mobile services and fighting over these high-paying customers that have big bills, basically trying to turn these over from one account to the other.

Wireless local loop offers an opportunity to grow their business. They have an asset in terms of the spectrum they bought from the government. Assets in terms of the infrastructure equipment that they've installed. The key is, now how do you go ahead and try to get more minutes of use on that equipment. And wireless local loop is a good application.

Now, we've been involved in quite a few wireless local loop applications throughout the world, and a lot I've been involved in markets and countries where the communication infrastructure is not developed. And these developing countries, like the Ukraine, like Russia, the Philippines, Thailand, where teledensities are low. Probably even lower than some of the numbers I heard in this room.

What's been real interesting to us -- let me move out of the way here is that we've gone into this situation where there is no infrastructure. We've had to go in and try to do an education effort to say that, traditionally, telephones have been delivered this way, but here is a new way to take a look at those. It has been really nice to have green field applications, where there's no infrastructure whatsoever, there's no copper, there's no cellular, there's nothing, and we look at the alternatives at the point of a copper-based system versus a wireless system, and the level of service that customers want to provide.

So there's a lot of progress, and proven technology, economics in using wireless loop technologies for circumstances similar to yours.

Now, let me just talk briefly about some of the benefits for these type of applications. Faster deployment, which allows you to make the decision to go ahead and pursue an opportunity, time is usually of the essence. Funding is available. Funding may have a window going away, so you want to be able to act quickly.

Wireless technology, it's just the nature of deployment, as people will talk about later in the conference here. In Mexico, we shipped out units ordered earlier this month and it will be fully operational by the end of the year. That's pretty quick deployment, going from making the decision to get into the business to the ability to have commercial customers.

Both in terms of capital expense and operating expense, the local loop application is a lower investment. The idea is to offer an alternative to a copper-based system. If you look at the life span of the network, the biggest amount of money doesn't necessarily go to the hardware that's involved in building out the network, but it's people, recurring electricity, and utility bills. If you look at the basics -- the number of sites you need, size of the buildings -- for local loop applications, you'll, in fact, see that the operating expenses will be lower.

One thing we seen in our deployments is the benefit of coverage flexibility. In the planning process. You identify where the callers are going to come from so, you'll be right at one point in time. However, you're bound to be wrong at other points.

People tend to pick up and move. People identify economic opportunities in new apartment buildings, a shopping center, a new road that will generate more traffic.

The key is, it's hard to predict where traffic is going to come from. With a static system like a copper-based system, you don't have the ability to make that change. The wireless local loop system give the ability to simply add capacity. We'll talk about some tricks in terms of using the spectrum more efficiently by installing some additional capital out in the field. But deploying growth through wireless is, in fact, easier to handle than growth through copper.

One of the most important things with local loop is using transition to additional services. If you look at wireless local loop systems based on the various technologies, if you go in there with a vision of one service, say your service that you have in mind is to go to the small business, to let that small business user, say, get his initial line, or maybe a second or third line to handle his computer and his fax machine.

After you have built a good customer base for revenue, you start paying back your investment, but all of a sudden you realize well, now I have this investment out there. How else can I go ahead and try to get more money out of it? If you look some other technologies out there, it's real easy to add on mobile applications for the exact same network that you used for your fixed wireless. Maybe now with that same investment you can go off to some of the other areas and try to strike up some of these roaming requirements where two networks can go ahead and interact, so your network can help cover some of the holes in the coverage that these bigger carriers might have.

That's one of the beauties of this wireless local loop system, based on standards, is that you can, in fact, interact with other carriers, other services, to basically take advantage of revenue opportunities. Here are some generic things about wireless local loop

The basic criteria for choosing come down to a few basics. The first is capacity and coverage. Capacity basically means how many subscribers, how many users can I provide service to in a given area with a given amount of equipment. In our business, particularly, we define a given area by cell site. A cell site is the physical location where the antenna and receiving amplifiers and transmitters are located, and that's what communicates back to the base station.

Capacity is real important, it is hard to predict where the traffic is coming from and how much traffic is going to be there. One thing that I've found which has been surprising throughout the world, over the last 18 months, is that for people that never had phone service before want more services. Like in the Philippines people want home fax -- the most data communications device out there.

The need for high-speed data has been surprising to me. We built a network in Ukraine, we have voice service. But the guy is saying to me, he goes, I can't grow my network because my customers won't take the service unless I can offer packet data services. This is the Ukraine, these guys haven't had phone service for a long time ago. And the phone service they've had has was scratchy and unavailable.

I've just been surprised that when you go off and deploy new services to people that haven't had service, how quickly they go up the appetite curve. I think it's a pretty delightful thing. It surprised me.

All of these new services that you employ impact capacity, and as you evaluate different technologies, you have to be able to figure out how fast am I going to be able to deal with this extra need for capacity.

The other dimension is geographically coverage. How far out can that furthest person be to get service? You know, in the RF world you can play with things like let's go ahead and raise the antenna higher. That may not necessarily go good towards the zoning regulations and things like that.

You can go ahead and juice up the transmit power sensitivity of the receivers. There's different ways to play with that, but you have to do those sort of tricks, in RF engineering. But that's part of the fun of the game.

The other thing is voice quality. The thing that we're trying to do with wireless local loop is voice quality measured in terms of being land line equivalent, wire line equivalent.

From an availability perspective, we always want to people to get dial tone, to have service when they want it, in terms of the service not always available and getting busy signals. More important, particularly the people that may not necessarily have a phone in their house all the time, but have used phones in other locations, we don't want to introduce a new type of thing to their life. The idea here is, even though this is wireless, the objective is to give them a land line experience.

When you use a cell phone right now, it's a little bit different than using a land line. You have to power the thing on, dial digits, and then press send. That's a little bit different than what you do with a land line. So, in the land line scenario what you do is pick up a receiver, get dial tone from the network, and then the network knows when you've pressed your last button, so you don't have to press send.

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That's the type of experience that you want to provide to your user in a wireless local loop scenario, and the technology is available for you to do that today.

Earlier the lady from Alaska talked about, the saturation, you know, do these cell phones go all over the place. I've been surprised when I've been in China where I was buying fake Rolexes in a small street fair. They didn't have enough of them, so she pulled out her cell phone, called the back distributor, and he comes running with more. But the idea is, there's more and more users out there. They're going to grow. And what you know, in India and China, and places where the GDP is really low, I've been surprised by the people that have cell phones. The traffic is going to be generated, but the trick is how to handle this traffic?

One thing about our technology is our ability to take advantage of the spectrum that you lease. And we have been talking about partitioning the license, or the spectrum, and use that spectrum to your own application. One of the key things about some of the technologies that once you've come up with a business agreement in terms of partitioning that spectrum, how can you actually go ahead and slice up that spectrum and efficiently use? One of the characteristics of our technology is, in fact, that within an antenna, you can go ahead and create some sectors in there. By sectoring the coverage, you can, increase the number of subscribers that you're able to handle in one cell site.

But let me wrap up a little bit in terms of the type of customer you see in a local loop application. One of the things that we want to talk about is we want to make people feel that they're using a land line, even though there's no wires.

Some of you people that use a cell phone, how do you usually hold it? You hold it in your hand, usually? Okay. When you're at home, how do you usually hold your phone? Anybody ever do the neck thing? Now, the neck thing is not a good thing to do with this. It hurts. And also, the trend in phones, in cell phones, they're getting smaller. If you're on the go, it's good. But if you're at home and you're sitting there and watching the ball game, or standing there trying to cook dinner, and you got to do the neck thing, you want the right phone. This phone here is completely integrated in the sense it's got a key pad, it's got the neck thing, the ear piece there, and it's got an integrated antenna.

This phone is good if you like the looks of this phone, and also, if you're using the phone in one location in that house, and only one person needs to talk on that line at the same time. Particularly in North America in households, is there's usually more than one phone in the house. Usually one in the kitchen, and one in the bedroom, at least.

The idea there is how do we go ahead and sort of distribute that telephone number, even though it comes in wireless, to multiple locations in the house? You have this box here. It allows you to drive two-wire telephones throughout the house. You can pick it up from multiple locations and attach a speaker phone, a caller ID box, or more importantly a fax machine or a modem. It gives you the flexibility there.

MR. HADDON: I'm Perry Haddon from TVCON. I have a Mexico partner, and part of my business is in Mexico. I do quite a lot of work down there. We've developed a videotape to show the government in Mexico to demonstrate our work. We have a number of licenses, LMDS licenses, along the US-Mexico border, from the tip of Texas up through El Centro, California. The purpose is to hopefully to

some day we would have the right to interface across the board and to serve Mexico needs --education and telemedicine.

I had the privilege of working with Tribal chairman Pat McGee, Prescott Apache Tribe, for a number of years, serving on quite a number of committees, water resources and so on. She told me one day that her mission was not to provide for the current needs, but to prepare her people to be rich. That particular Tribe has the advantage of having some strategically-located land, and there are not very many members of the Tribe.

It was clear to me, and body else that just giving people money cannot prepare them to be wealthy. This can only happen through Tribal education and teaching of values of responsibility for themselves and family. This was her dream. The people on this panel don't presume to know what your dreams are, but we wish to express that as you develop your goals today, and the goals that in the future. Communications is going to be great part of the solution, or the fulfillment of those goals.

Wireless communications, be it for medical, education, business, or data transfer, Internet services, or personal communications is the fastest to deploy, most economical, and highest overall capacity of any method of delivery. Why wireless is the fastest to deploy?.

There's no trenching. There's no poles to erect. There's no pole fees to pay, if you're having to go on existing poles. There's no franchise fees from the local communities. There's no construction liability, which is a significant -- a whole department in these type of companies. No underground repairs, no cable plant outages.

In Hong Kong, Warf Communications has a CATV or cable television company with wire spread all over the city. As they begin to grow, they decided to use wireless. Last year, they had 25 outages. 23 of those outages were due to their capable plant, and two of the outages, eventually came back on without repair. But none of the outages could be attributed to their wireless plant, which was now covering about 35 percent of their overall plant buildup.

There is no signal degradation, and the systems are quick to upgrade. There's never one solution. Each of you present have a variety of requirements, and your requirements today, and in the future, will be different. You have a variety of beta rates, terrain, rain and heat conditions that can cause changes in the propagation characteristics. The amount of embedded infrastructure that will be incorporated into your system will be different.

While you may an attempt to share information, when you develop business plans, it's impractical for you to share business plans. And you absolutely need a professional consultant.

Earlier today, I heard people complaining to the FCC that they didn't know that certain things were happening. A company like mine did not know much when we got started. We consult FCC attorneys in Washington, we hire consulting firms to help us. And my advice is that you could do the same. Having said that, I think that it is also important for you to be able to help your consultant firms by knowing what you want, and by them helping you understand what some of the possibilities are. I think there are some ways -- some things that you need to know.

For instance, the difference between frequency. When we sit up here and we say well, you know, we have When we say broad band, what does that mean? And who cares if it's broad band or narrow band? I paced off the length of this room. It's about 100 feet. If that is the entire spectrum, the first two feet of it was used from the time of Marconi, the father of radio, to the Navajo code talkers at the end of World War II. About one or two feet of that entire room of spectrum is used by AM/FM radio, cellular telephone, all of the maritime uses, police uses, -- just about everything that we can think of that is commonplace today, is all within one gigahertz.

People in LMDS are asking for one gigahertz of spectrum, this is band width, for their own use. So, it's kinda of interesting to get this in perspective.

It's also important to understand that when we're talking at the other end of the room, at the lowest frequencies, that those frequencies travel the furthest. And at the highest end of the spectrum -- up around 40 gigahertz is the practical limit today, and that doesn't travel very far.

When we talk about different systems, there's a huge advantage to low frequencies. If you're trying to travel a great distance, but the problem is that you have very little band width at low frequencies already used by AM radio, FM radio, television, and so on.

The amount of band width is equated to the amount of information that you can send, or the amount of data that you can have. You need a fairly large amount of band width in order to have video on Internet applications to get pictures, without having to wait for ten minutes for a picture to appear on the screen.

You cannot get large band width at low frequencies, but that's a huge advantage. It's a great advantage that it doesn't travel so far. When you're at low frequencies and it travels a great distance different uses may interfere with each other. That is a common problem with CBS you're always talking over each other, you're interfering with each other. Those things happen the lower frequencies.

At the high frequencies, we can make it so that individuals can use the information, and that we could reuse the spectrum. And I think that's all that's important today. The overall point that I'm trying to get across here is how important it is that, with all of your varying conditions, to hire a good consulting firm to help you out.

You mentioned that you wanted me to say something about encryption methods and security. It's very important in telemedicine, for example, that if a doctor is doing the examination, he wants to make sure that the doctor and the patient are the only people that are watching this examination.

This is absolutely a system that can -and does incorporate the best of encryption systems. When Qualcomm talked about CDMA earlier it is a system that is so highly encrypted that people, not even law enforcement, can listen, and watch what's going on.

A tribal council or chair could specify exactly which households or people were going to be able to receive the information. Even the system operator is not able to eavesdrop with communication because he would not be to identify it.

We have licenses along the Mexico border from Brownsville, Texas, through California, and if you are in this area, we'd be happy to talk to you about the use or partitioning, and some of the other methods that we've been talking about.

MR. WELLS: My name is Ron Wells, I'm from Black & Veatch. I'm going to answer the questions on how you deploying a system. Let me summarize Black & Veatch as a company. We've been involved in deploying 4000 plus cell sites. On the wire line side, we're either involved with or have completed 25,000 miles of fiber Coax.

We're one of the top three telecom infrastructure deployment firms, if you will, in the United States. Firm-wide, we're a \$2 billion company, et cetera, et cetera.

What I would really like to get across today is what are the different aspects that goes into deploying a wireless site, or a wireless system.

Let me put a slide up real quick that shows some of the different aspects that go into a network build-out. When a business plan is created, and I'll go into that in a little more detail, the first thing that is done, usually, is some type of RF engineering design. The next phase is site acquisition, where you're looking at where do you place the sites, and then you design the specific sites, and then you construct and manage the sites. After that it goes over into the maintenance and then operations..

The RF engineering, decides how many sites you need. When a business plan is created, some of the key factors are access to a switch, and site coverage.

When looking at an overall value of deploying a wireless network, you define a task value -- task value as the percent of a site cost, a cell site cost, versus percent of a site schedule. So if a particular task in deploying a cell takes 10 percent of your schedule and 10 percent of your budget, it would have that appropriated weighted factor. If it takes 30 percent of your schedule but five percent of your cost, it have that particular value.

As you can see here, these are the main aspects. Program management is taking the business plan in hand and making sure you end up with a system meets your specifications -- site acquisition, site zoning and leasing. RF ensures that work, engineering, site engineering, construction management, and site construction.

One of the biggest problems we run into is that site construction -- materials and actual building of the sites -- takes almost 75 percent of the money involved with deploying the site. Now, this doesn't include actual radio equipment or computer equipment. This is pouring the concrete, this is laying the rebar, this is erecting the tower. It is very labor-intensive, and a lot of the money that goes into deploying these sites can be integrated back into the community.

When we deploy sites, we like to use our subcontractors, or the people that help us build these sites, to actually maintain them over the life of the system.

The business development activities, we see come up a lot, and that's really the stage that it sounds like a lot of you are in right now. There are four categories -- strategy development phase, a feasibility study, a business plan, and then obtaining financing.

The strategy development phase looks at determining what type of technology you wish to use, what types of services you would like to provide. How much risk you want to take and reward?

On the feasibility side, it's looking at your market, is there competition .

Conceptual design, usually a preliminary RF design is done to look at how many cell sites would be required. It looks at revenues, implementation plan, et cetera.

The feasibility study is taking a group of ideas that you have, strategy-wise, and seeing if they really feasible to do. And out of those ones that turn out to be feasible, economically, et cetera, we then create a business plan.

The business plan covers everything from the roll-out strategy, the marketing plan, risk analysis, sensitivity analysis, which is very important. The sensitivity analysis, in and of itself, is how you look at how certain aspects or assumptions you make in your business plan affect your overall business.

The switch was mentioned as one of the sensitive items. The number of cell sites is also an item of sensitivity, and it goes on down the line. Once you have a business plan in hand, you going through the financing steps, and then deployment.

To give you some rules of thumb, in terms of duration, it is a year or less. For example, in Brazil, a system is being deployed in Rio de Janeiro on an aggressive schedule. They're putting 200 sites up in 200 days. The schedules are getting shorter and shorter as people become more versed in how to deploy in type of technology.

For example, on the wire line side, if you want to bury fiber, it's going to cost about \$60 to \$100,000 a mile. That's just the way it runs. If you have rock in the ground, it goes up. And if you need to go deeper, it also goes up.

Coax fiber is another player. You're looking at \$20,000 a mile just to put Coax in the ground. So you can see it doesn't take a mathematician to realize fairly quickly, that a few wireless sites in smaller areas.

Program management basically wraps the whole thing together and makes sure that you get what your business plan said you wanted. It includes a kick-off meeting, providing oversight for all the different aspects, RF engineering, site acquisition, leasing, zoning, architectural engineering of the site, construction management, construction, maintenance and material management. There's a lot of different things involved in these build-outs, any one of which could completely throw the project off.

Some of the obvious ones would be RF engineering. If RF engineering is done poorly, you may end up thinking you need twice as many sites as you actually do, all the way down to little things like material management, tracking nuts and bolts.

If, after you build out your site, you realize you have four extra sites with the spare parts, that also can have an impact on the bottom line, too.

So, these are some other issues, too. Quality control. Progress reporting. It's important that the project proceed as planned. If it looks like it's not getting to where it needs to be, then corrective actions need to be made to correct for that, to keep it on schedule.

On the RF engineering side, it includes your preliminary and detailed design to support construction so the antennas in the right direction, at right angles for system validation and optimization.

Network engineering activities. This is also referenced as the backhaul side. This is connecting all of the cell sites together, whether it's done with leased lines or fiber or microwave or even LMDS, it includes network planning all the way through the system, validation and optimization, as well.

Site acquisition and zoning activities. This involves the real estate side, site acquisition, and the evaluation. When the RF engineer says I need a site in a particular area, we then ask a site acquisition specialist to go and find maybe three different sites that are within the area that can be built, whether it's on top of a roof or it's a new tower or co-located on an existing tower.

They go out and find these spots, and selected and built out. We'll also have zoning procedures, zoning approvals. Those types of issue are covered by site acquisition.

MR. YAWAKIE: Some Tribes already have microwave services or services going across their areas. You mentioned microwave relocation. Who is responsible for that, if the Tribes want to implement a wireless local group? And maybe you can explain what microwave information is.

MS. McKENZIE: I can do that. Basically, microwave relocation is usually a two gigahertz band width. The frequency is at two gigahertz. The new PCS carriers will ask you to relocate your spectrum down to a different frequency so that it will be clear. Generally, there's some type of compensation to you for the burden of relocating.

Whose responsibility is it? Initially, it's the carrier that's coming into your area, if they are intending to cover that area.

In New Mexico for example, the Pueblo of Laguna, would partition spectrum from Diane and a Albuquerque LDMS. Then it would be up to Diane and the Pueblo community representative, to discuss the arrangements to relocate that spectrum so that PCS system could work on that geographic territory. If your tower has the structural integrity, you could use that actual tower for part of the infrastructure. Is that what you were asking?

MS. DEL ROSSO: Earlier I said that in the '90s, the FCC reassigned microwave spectrum to the PCS carriers. And as part of that arrangement, it's our responsibility to work out a process that's fair, that pays to move, so that it is still usable.

MR. GARCIA: Can you use existing towers? Say you've got a radio station tower coming on line, and portions of that tower can be designated to house antennas, or whatever. Can you use those existing towers for any of these?

MR. WELLS: That is really a question. It's referred to in the industry as co-locate, and what needs to be done is a structural assessment of the tower, to make sure it can handle the extra wind loads and weight loads > It's a common thing to do.

In fact, a lot of companies may only have one antenna to hang on the tower, but they'll design the tower for four antennas, just so that they can provide that extra service. And that's turned into a big business right now.

Architectural and civil engineering activities covers the actual built out from the construction drawings site plans, electrical details, et cetera.

Construction management activities -- field people support the design, facilitate the permit processes, construction contractors, coordinate contractors on-site, and also, hands-on material management.

Construction activities include product construction, field engineering, construction office staffing, construction logistics.

And lastly, the maintenance activities. Usually what happens when these sites are built out, there will be an initial warranty period that the company will offer, that then transitions into a maintenance program. The warranty is usually around a year long or so, if anything goes wrong with the site, it will just be covered underneath the original price. Then it is transferred over to actually maintaining the site by the operator/carrier.

There is a small parallel between what you all are considering and what some of the different co-ops are now going through with the D and F blocks. We've been involved with writing business plans and building out their sites. Some require only a few sites. Some are larger, but there's a lot of parallels between small and large site needs. Basically the goal is to improve the quality of life for the people that they represent. They're not out to be owned by a large international firm or, you know, like the AT & T'. We have had a lot of good talks with some co-ops, and are now working with them.

If you are looking at business plans or are about ready to start writing them, you may not need to start from scratch. There may be some opportunities to share information..

MR. NEEDHAM: My name is Patrick Needham. Our your sites bullet-proof to high velocity rifles, 3006s, and things like that. We deal with that vandalism in some of the rural areas? Also on my reservation, elevated areas are sacred sites. How do your engineers work with that type of situation.

MR. WELLS: The bullet proof answer is we use a lot of concrete. We camouflage some antennas on roof tops and things like that, but if someone wants to blast a hole through them, they can. The expensive equipment, the actual DTSs and things like that, those are inside concrete enclosures.

MR. WELLS: And they're put in there for that reason. Some companies say only the ones that they want to be concerned with on the edges are the ones they do that to. Other companies just say all their sites are that way. In response to the other question, if you leave it up to the RF engineer alone, to decide where all the sites are, you run into problems.

Site acquisition and leasing and zoning and the issues you mentioned, as well as constructability, they may pick a site that's the perfect RF site, but it costs \$3 million dollars to build, which isn't practical. It's a general standard for the industry, to form teams that rank the sites. And maybe as a construction engineer, I'll say site A is better than site B or C. Back to when the RF engineer says, here is the terrain, please go find a few sites in that area. We'll go out and then rank the sites.

If there's an issue than it just can't be built there, then the site is taken away. The alternative sites are ranked for constructability, RF engineering, site acquisition and zoning, and all other special aspects.

In your case, I would highly recommend is having a tribal representative on the team that understands those issues, from within your Tribe, that can say here are the areas that we just can't even consider.

MR. GARCIA: If I travel outside of San Juan Pueblo, is there other infrastructure supports?

MR. ARTMAN: Right now there are currently three digital technologies out there, the GSM, CDMA, TDMA and for the most part they're compatible with one other. But all three actually have national networks. CDMA has a number of companies Sprint and PrimeCo, which are laying national companies. TDMA one company, that's all you need, AT&T. And then GSM is a consortium of 22-23 companies and are building a budding network that form a national consortium for many of those technologies. CD and GSS actually go overseas. So you can take your cellular phone to Spain or Hong Kong and use your phone over there.

There are some dead zones. Some companies like Nokia and Qualcomm have phone attachments. For GSM for example, Albuquerque is a dead zone. This attachment allows you to have what's called dual mode service, so it automatically goes onto a cellular system, and for the last 15 years, they've been doing nothing but putting up towers and creating a good backup.

MR. GARCIA: Okay. Thank you.

MR. MADEBEG: Teleglobal Star is developing a satellite network, and we're building telephones with it. The telephones operate in three modes. They can work in digital CDMA, analog amps, or satellite modes.

MR. GARCIA: Is it affordable.

MR. MADEBEG: It's all relative.

MR. NEISS: Because our cultural differences and thinking, Tribes sometimes think they're an island, - an internal island. Some Tribes use that. But I tell my folks there's a lot out there, and if we don't speak for ourselves, we don't go out and promote for ourselves, someone else will, and they'll be receiving that money. A lot of people aren't aware of the difference between Native American Country as opposed to non-Indian country. We have own law, code, constitution and bylaws/ Just because something was passed, it is not necessarily the end all. Some of the Tribes are just now waking up.

Change scares some of our people. A few people like myself are out here saying we have to take advantage, we have to seize this opportunity. But we go back to our culture.. Companies need to come to

the Tribes, and say we are willing to go into partnership with you. We're tired of being the customer, I'll tell you that much.

MS. MCKENZIE: I think you've got a huge opportunity, and really, it's not too late. The large, lion's share of the C block licenses were defaulted by players that just could not come up with the financing. Perhaps they bid too high with their licenses. The unused licenses will be reauctioned, and you can access that information through <http://www.fcc.gov>.

But there are several licenses nationwide that are going to be reauctioned on the C block, which is 30 megahertz, and on the D, E and F switch. I think as Amy indicated, nine new auctions coming up, that will offer the opportunities for all of this new technology for the Tribes.

So, I think certainly, you can count on the six of us here to offer you any information, and we let you about the auctions coming up. Myself, Perry Haddon and Carl Artman has been involved in these auctions. If you need help, you can call any one of us on the panel, and we'll be happy to help you get that information.

MR. ARTMAN: I'm a lawyer with a background in telecommunications law, as well as Indian law. I've worked for both Oneida and other telecommunication companies. While I was working for Oneida, I was doing a lot of these issues with rights of sovereignty, water rights, air rights. A couple of us at Oneida did a feasibility study about a year ago on whether or not we could create a satellite forum, under the auspices of ownership of air rights.

There's a certain level of thinking that above a certain level of spectrum, it no longer belongs to the United States, and that means we can shoot above that, and shoot up and down -- but anyway, cost wise it wasn't feasible. The one thing we did find that there are some basic interactions of sovereign nations. You're a sovereign nation. We are sovereign nations within a sovereign nation. The Constitution of the United States provides, through the Interstate Commerce Clause, broad authority for the United States government. That's where the FCC derives its authority on spectrum above our land, above anyone's land. So when it comes to dealing with the air rights, the FCC does use the interstate commerce clause to take over control of all spectrum, no matter where it falls, no matter over whose land it is, be it personal property or Tribal property or government property. The Army and Navy do not control the air waves above their land. Unfortunately, it's certainly, in light of Indian sovereignty legal issues, it is a very good question, and an issue which is out there, but it's also one that we've looked into, and we determined it's a losing argument.

MR. WELLS: I don't know if I was clear enough early that when we deploy systems that we look to your groups for staffing, deployment. It takes considerable source of personnel and training people for new skills. Black & Veatch is very used to working in those type of circumstances.

In fact, it's almost a requirement, as soon as we go overseas, to bring up the local staff and to teach them the skills, and then to allow them to participate in the actual deployment of the system .have a

MS. FLOWERS: Do you factor in environmental concerns like in Alaska where people have to physically sweep snow from the satellite dishes, maintain heaters, and deal with water affecting the systems. I'm not sure about cellular sites, are there factors that need to be concerned.

MR. HADDON: We always take into consideration the icing conditions.

MS. FLOWERS: If the system is owned by the Native corporations or the Tribes, will they be trained – to perform a certain procedure?

MR. HADDON: You have to file a FCC maintenance plan.

MS. McKENZIE: Part this wireless local loop development presentation, is to train the Tribes to ultimately own and operate and maintain the sites themselves. You know, to be involved in the actual construction and development of the system, as you go.

MS. FLOWERS: So there's no finger pointing going on?

MS. McKENZIE: Exactly. And always, you know, the climate issue is a consideration in construction. Ron could probably speak to the water and the microwave dishes.

MR. WELLS: Real quick on the cell site parts, they do design the sites to be ice proof, if you will. They put ice bridges to cover the cables, so if a large chunk of ice falls down, it won't sever the cables.

Another aspect is schedule, which a lot of people don't think about. Sprint to deploy a system during winter in Minneapolis. Their costs soared because it is not easy for someone 150 feet in the air and trying to put a little lug nut onto an antenna and attach it to an icy tower.. And in Alaska, that would be a major factor. It still is cheaper than burying fiber inside frozen tundra.

MS. FLOWERS: Somebody is doing that, though, from Prudo Bay down to Anchorage, as we speak.

MR. WELLS: But there's a lot of other aspects on the deployment side, as well as the equipment can be designed to minimize those types of issues.

MR. YAWAKIE: The deployment costs sounds very attractive. But from a consumer's perspective, when a Tribal member uses these services, does the deployment costs reflect the service costs? If I'm connected to the Internet for two hours, are the costs comparable to like a cellular service, that isn't affordable? For my band width requirements, such as like video conferencing across like a PCS, what's expected for service costs?

MS. McKENZIE: I think you price that yourself. It's your business, and you would use a other consultant, to help you price it under a business plan.

MR. YAWAKIE: So it would be very similar to like a tariff service?

MS. DEL ROSSO: I guess ultimately that would be the goal, to get to a land line scenario. It was depend upon how available capital. If RUS underwrites the system with a loan then it is part of the business planning process.

UNIDENTIFIED ATTENDEE: Does the RUS require a licensed engineer to be the operator?

MR. HADDON: The licensee is ultimately responsible. That person can delegate authority, but ultimately. If there was a mistake, if something happened, it could be my license. It is incumbent upon me to train someone to do the job right, and have a good auditing process, to know that I'm that the -- that everything is being done correctly. The actual person turning the screw may not have to be licensed in all cases.

UNIDENTIFIED ATTENDEE: Does the tribe need to hire an engineer which has passed certain tests to meet any FCC rules?

MS. DEL ROSSO: I don't know about the engineering questions. But if we partitioned or disaggregated our spectrum, then that Tribe would have to be considered in the entrepreneur's block. that is their revenues would be under \$125 million for the last two years, and have assets under \$500 million.

MS. McKENZIE: I believe their revenues are not included in the total, is what --

MS. DEL ROSSO: So in terms of that, they would have to be qualified under the FCC rules. I would assume that applies to whatever engineering-specific.

UNIDENTIFIED ATTENDEE: I mean some of this equipment is going to be on Tribal lands, within the boundaries of the reservation.

UNIDENTIFIED ATTENDEE: In North Dakota where we're from an engineer runs the radio station.

MR. ARTMAN: You usually get your engineering expertise from Qualcomm, or Black & Veatch. You hire your expertise out-of-house, they install it, and they will probably also maintain it. At Airadigm, for example, we've educated our engineers to maintain it, so now they have met all the requirements that the FCC and Ericson and everybody else has to run a switch. And so, we do that all ourselves, all on our own. So they've gone through that training.

MS. DEL ROSSO: Right.

MR. ARTMAN: And you buy the big one, the PCS one.

MS. McKENZIE: I guess we need to wrap it up; we've tried to provide a broad spectrum group of experts from the industry, someone that's actually built a system on a reservation; my group is a systems integrator, an equipment vendor; two carriers, one PCS, one LMDS. Also I'm an LMDS carrier; and of course, the construction, system development company, Black & Veatch. So I hope that we've provided you some valuable information, and copies of our presentations are available. Thank you very much.