FEDERAL COMMUNICATIONS COMMISSION

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PUBLIC SAFETY NATIONAL COORDINATION COMMITTEE

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IMPLEMENTATION SUBCOMMITTEE MEETING

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THURSDAY,
SEPTEMBER 19, 2002

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The Subcommittee meeting commenced at 1:30 p.m. in the Commission Meeting Room, 445 12th Street, S.W., Washington, D.C., 20554, Ted Dempsey, Chair, presiding.

COMMITTEE MEMBERS PRESENT:

TED DEMPSEY	Chairman
DAVID EIERMAN	Member
ROBERT SCHLIEMAN	Member
ALIREZA SHAHNAMI	Member
TOM TOLMAN	Member

ALSO PRESENT:

MICHAEL WILHELM	Designated Federal Officer

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

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

1:34 p.m.

CHAIRPERSON DEMSEY: We are going to get started with the Implementation Subcommittee meeting.

I apologize for not having made copies of the agenda, so I will just review it real quick. There is a slight change, but you don't know there's a change because I am the only one who has it in front of me. I could make it up as I go along.

(Laughter.)

We are going to start with a presentation by Sean O'Hara, I guess to really give us an update on the database and some changes that you have made. I think there's a new proposal involved in there, too?

Then Dave Eierman will give us a DTV transition report. I will ask Bette Rinehart to step in for Fred and give the policy report. Technology policy will be Ali Shahnami. Tom Tolman will do funding.

We've got some old business which we started out discussing on listservers, one of them being the 50 dBu issue. We are going to just go over the updates to the Guidelines document that we have made, updates to Appendix A in particular, and talk a little bit about Region 5 plan status and also discuss the loading criteria, which we started out discussing on the listserver, and then new business. That's the agenda.

Sean?

MR. TOLMAN: While Sean is setting up there, just for those of you, just a quick background: Essentially, what we are doing here is providing an update of a decision that was made -- actually, this goes back almost two years. It has taken that long getting the contract signed and working through the logistics of finalizing this. As of August, we were running with this.

So this is what is going to be described as essentially what we have been calling the "Packing Plan" that will go on the database, this voluntary, agreed-upon, and customized according to

the four coordinators.

That is the other thing. It needs to be known that this was assembled and customized and built, the specifications and the engineering pieces that Sean is going to be talking about is the capability that the group wanted, produced it through the NPSTC since this comes under the purview of the NPSTC through the NPSTC Support Office, and again will be part of a capability within the CAPRAD database.

MR. O'HARA: Thank you, Tom.

Can everybody hear me okay? Is that better? I've got to lean into this, I guess. I'm not used to that.

Again, as far as this data pack or the pool allotment plan, we are at a point in the process where I wanted to kind of go over some of the details of what we're doing to make sure that everyone is fully aware of what we're doing. There's also some methodologies that I am looking at applying in terms of the contouring and frequency assignment techniques.

I brought a lot of results that I'm not going to go over in this meeting, but I know a lot of you -- and I am going to go over them with a lot of you to show you results from your local areas. Because you have a better feel for your local terrain issues and your frequency coordination issues in your local areas, you will be able to tell me and provide a sanity check whether or not you think these algorithms are working, as they appear to me that they are.

So with that, I am going to give a quick description of the pool allotments. These are temporary placeholders for the spectrum until they are assigned to an applicant by the Regional Planning Committees themselves.

Subject to the regional plan, they allow the applicants to get channels without incurring much of a delay, particularly early on in the process. A lot of places you can pull directly from your pool because they have already been quasi-pre-coordinated. Until things start getting crowded and actual systems go up, they should serve well.

If they're done correctly, you can really maximize the spectrum re-use, particularly if they're followed. You can also fairly distribute this spectrum according to user/agency demographics. I will mention a little more about that.

So there's really a need to populate this pre-coordination database with some pool allotments. Of course, these are for the general use channels, and they provide a starting point for the Regional Planning Committees and they cover a defined geographic area, each one of these pool allotments.

The selection of site locations within an area is not restricted whatsoever. Again, these are just recommendations.

In a way, we have done this to really help the Regional Planning Committees with a lot of their work. The feedback we've gotten from a lot of the Regional Planning Committees is it is going to save them a tremendous amount of work, rather than trying to develop these pool allotments themselves and the sharing arrangements along the borders.

We are trying to do this right from the start, trying to take advantage of some more advanced modeling techniques that are available now that perhaps weren't easily applicable when the NPSPAC pool was developed. By adding some complexity to the models, we are going to get a little better accuracy, a little better consideration of terrain and spectrum re-use.

You could say it will be a fair process because you are going to be modeling the user demographics a little more accurately, and of course greater spectral efficiency.

Why nationwide? Well, there's a whole lot of regions that are various shapes, sizes, but all the regions have to co-exist with each other. So it really needs to be fair channel sharing along the border of those regions. It really needs to be based upon user demographics more than political boundaries.

If the pools are fairly developed and everybody agrees that they are fairly developed, then it really expedites inter-regional concurrence

and agreements as far as how they are going to share these frequencies along the borders to begin with. If the multiple parties come to the table and they realize that the sharing plan along the border was done fair, in an effort to make sure everybody got as much spectrum as they possibly could get, then it makes it a lot easier for them to negotiate how they are going to split that.

More importantly, packing this spectrum on a national basis really maximizes the channel re-use. All the individual Regional Planning Committees do a great job at 800 MHz as far as trying to pack the regions as tight as possible to get as much spectrum as you can out of them.

But because they operate independently, you really can't do it optimally. You can't really get a very optimal solution at all because, as you know, when you start assigning frequencies, the ripples from those frequencies have effects, and those have effects, and then those have effects. It almost goes on forever.

So you kind of have to look at the whole

country at the same time. Now Hawaii, Puerto Rico, Alaska, you know, those kinds of areas, they are regions unto themselves that pretty much don't have those kinds of issues. But as far as the main portion of the country, everybody does have to coexist.

These pool allotments are done by county or county-like areas, according to the FCC and Census Bureau. One thing you can see immediately is across the country the areas and, in fact, the user populations vary considerably. As you go out west, the county size tends to get very large, larger than some states in the Northeast, as a matter of fact. As you go east, the county size tends to get a lot more congested.

When we talk about coming up with a better capacity model, what we are going to do under this is leverage some of the things that we have done under New York State, when we have come up with some fairly detailed traffic and capacity models for their system.

One of the things we find, which is not

altogether too different from what PSWAC has found, is that although you are going to have user and radio traffic hot spots that correspond to your municipal areas and cities and villages, and whatnot, there really is a disproportionate amount of spectrum in the rural areas. Just because there's not a whole lot of people living there doesn't mean that you don't need a police force to police that area. It doesn't mean an incident couldn't occur in that area, for that matter.

We are also going to utilize the terrain as much as possible in this process because we know in reality you can't assign things according to circles. If you have a mountain in between you and another county, you certainly probably could share co-channel frequencies easily. The only place you're going to have interference is perhaps on top of the mountain.

So what we are integrating in this model is a realistic model for interference. Because of that, we are hoping to get a lot of -- well, we will get a lot better re-use of the spectrum and a lot

better prediction of interference.

These pool allotments, there are some ground rules associated with them. Let's talk about the channel widths first. First, the channel widths are going to be in 25 KHz blocks, contiguous 25 KHz blocks, both for voice and data. That both allows flexibility and at the same time doesn't limit your choice of technology at all within the pool allotments, which is important.

The capacity model is going to be based upon a normalized PSWAC method, a modified PSWAC method that we will talk about a little bit. The county boundary plus a three- to five-mile buffer zone handles the service contour, whether it be 40 dBu or whether it be 50 dBu; that is really not important at point in time.

The interference contour from the county is going to be terrain-based, as discussed. Probably most importantly to most of you, at a minimum, every county or county-type allotment is going to get four voice and one data channel. So they are going to get five 25 KHz channels at a

minimum.

Then beyond that, the capacity model that is developed here is going to assign the spectral resources until there is none left. So where there's contentions for spectrum resources, it is going to go to the capacity model and say, who's got the greater need when something comes available? It is going to basically assign and spin out the spectrum until there is nothing left to assign. According to the rules for re-use, any more assignments would cause interference.

I am going to take a couple of minutes now, more than a few minutes, to talk about both the traffic and capacity models and the interference and coverage models. Before I go to that, does anybody have any questions about the basic reason why we are doing this or what we are hoping to accomplish through this process? Yes?

MR. SALIBA: Jean-Pierre Saliba, State of Florida.

You mentioned a minimum of four channels for voice and one for data. How many can a county

get later on if they needed more, and on what basis will you allot these channels?

MR. O'HARA: They will get as many as possible. At a minimum, they are going to get that minimum set. At a maximum, they are going to get as many channels as possible, given a lot of factors, including the capacity needs of those around you and the interference constraints imposed by those around you.

For example, in areas where the counties tend to be small, perhaps you might see that overall each county might get a smaller set of frequencies because the interference potential in those regions is going to mitigate the ability to give everybody a whole lot of spectrum, because you can't use this within a cluster of, say, an interference constraint range.

So to tell you how many channels you are going to get, you could get a lot.

CHAIRPERSON DEMSEY: Sean, I think the best way to answer that, you are not going to get a lot. You are going to get as many as the region --

when you file your regional plan, you are going to ask for channels based upon your requirements. This is strictly for planning purposes. One, to show where channels will be available and how many channels will be available in a particular area, and then the second phase of the database will be used by the frequency coordinators to track the channels that are allocated.

As far as how many channels you will be able to get, that is going to be contingent upon your region, the rules in your region, and your requirements. We are going to discuss that a little bit later, but if you have, just to make it simple, if you have a thousand users, according to whatever your Regional Planning Committee decides, you will divide those number of users by the loading criteria, and you will come up with your channels.

It is a simplified explanation, but it is not an idea that the county will get as many channels as they want based on the model.

MR. O'HARA: Right, and that was well-said.

Basically, this is for the Regional Planning Committees to look at applications and say that County X has come in here asking for this many channels. Well, according to the pre-allotment pool, there are wide channels available here, so we could either meet his needs or we need to adjust something as far as that. So it gives them an idea of what channels in general are available in each county as things begin, and things are going to change very quickly as applications and licenses start to come about.

CHAIRPERSON DEMSEY: Yes, in fact, I would just remind you, too, it is really a pre-planning process here, just to give an idea of what would be available and this will help the plans, the regional plans develop, as they begin to pre-allot channels to particular county entities.

I hope that helped. It doesn't look like you're happy.

MR. O'HARA: The pre-allotment pool may show that in the beginning there's a lot of channels available in certain areas, and things might change

depending on conditions and what the regional planning activities themselves do. Because once that pool is developed, each region is left -- you know, it is up to themselves to decide to either use the pool allotments or not use the pool allotments. They are really there to help them, so they don't have to do a lot of the pre-coordination engineering themselves to try to figure out what is available and where it is available.

This National Capacity Model, as I call it, is being generated by first creating user population models. The models are really based upon prior EMS, law enforcement, and local and state government services.

What we do is we generate these user population models based upon modified versions of the models that were presented in PSWAC in the final reports of the subcommittees.

The fire, police, and EMS models I am going to discuss a little bit today. According to PSWAC, the government model that they talked about is a linear function of the other three models, the

police, fire, and EMS models. As a sanity check, we are just going through that to make sure that relationship holds based upon the models that we are developing. The core source data underlying all these models is the 2000 Census data.

Now as the process works, basically, you go through many gates. For each county we model the number of public safety users in each of those services. Then once we have a user population, we need to translate that into an Erlang or traffic loading, or some measure, some metric of capacity need for each one of the counties.

In order to do that, we have to consider the voice and data service penetrations of those user populations, their time schedules, their average and peak pre-user loading. Those factors all together kind of get you into what the traffic model is.

For example, you may find out that you have a thousand policemen in a county, and you may say, well, out of those policemen, only 80 percent of them use radios with any kind of frequency. Of

that 80 percent of them, maybe only 30 percent of them are using mobile data with any frequency.

Out of what is left, what percentage of those officers would be operating a radio during the busiest hour of the day, the busiest traffic period of the day? Then when they do operate their radio, how long are they operating? What are their voice and data needs for that one hour? Then we take all those together and really come up with a traffic loading metric across all the services and then sum it over all the services.

For those four things I have listed here, we will be using the PSWAC recommendations for those values, augmented by other data as necessary. There's a very small difference between some of these multipliers that are being applied and the way they are applied in PSWAC, but it is only one of the PSWAC multipliers was broken out into basically two.

The slide I just flipped through is basically the per-unit Erlang load. I am going to kind of skip that and go to a slide that gives maybe a little easier-to-understand kind of metric.

For each active government voice and data user, what we are assuming is during the peak hour of the day they are using voice communications for 2.6 minutes and sending 11.6 kilobytes of data. This is the needs as we see them as we go into the future. Then you can read the rest of those as you go through there.

Police have the highest voice requirement, followed by fire/EMS. What you don't see here are the penetrations that are actually applied. You find that government users have a low penetration of mobile data services, maybe on the order of 10 percent or less. EMS, on the other hand, may have a very high penetration of mobile data services, maybe perhaps even higher than law enforcement services.

Basically, all this data is from Appendix G and also Appendix D of the Spectrum -- I don't know; I don't remember it -- the Spectrum Requirement Subcommittee within PSWAC? Yes.

Once we get all these traffic models, we are basically going to normalize them. Initially,

what we are going to do is we are going to find out, according to this traffic model, what's the channel requirements for each one of these counties? What's the realistic channel requirements, which tends to be a little different from the 100 units per channel, that kind of rule?

But I have decided against that. The main reason, when we talk about channel requirements, what you essentially do is you take a number that's got some decimal points to it and you end up with a number that's a number of channels. When you do that, you lose information and you lose some accuracy.

If we were to do that, instead of working in terms of Erlangs, it is possible that we could make erroneous decisions when we had resource contentions during the model. So I am kind of leaving everything in its most basic traffic unit.

These are the user models that we are looking at using at this point in time. I don't think these will change going forward. They are modified versions of the PSWAC models, and I am

going to look at a couple of those in more detail as we go on.

But in terms of these plots, the X scale is population density, and the Y scale is the percent of population that each service represents. So on the top left you see a flat line and then an increasing line. As the population density increases, as you get into more urbanized areas, the number of officers per thousand goes up, generally, because I think the crime statistics and other reasons drive up the number of officers.

The fire model, the inverse is true. Generally, as you get in some more urbanized areas, your services become less volunteer, more professional. Because of that, the number of firefighters actually tends to decrease per unit population. You still have more firefighters in a city than you do in the country; you just have less of them per every thousand people.

The EMS model kind of follows a similar trend.

What we did is, for each one of the

PSWAC models, there was kind of a limited range of data that was used. If we were going to extrapolate those models into ranges where there wasn't a whole lot of data, we needed to make modifications to the models.

So one of the things we looked at is a lot of data sources. This is a data source from the FBI on law enforcement officers. We found a direct correlation of some of the data we were using from New York State, which worked out to about 280 officers per 100,000 people, sworn officers.

We correlated that with some other data sources, and, amazingly enough, came up with, if you notice the slopes there, about 2.8 percent; that's 280 people per 100,000 population. So it is 280 sworn officers per 100,000 in units of population.

So with those both there, what we did is we fixed a break point in the PSWAC model. The PSWAC model essentially used to have a line that went like that (indicating).

The problem with that is as it got into the lower population, the very rural areas, there

wasn't a lot of data, No. 1, and at a point it predicted that there were really no police officers. In terms of other services, it predicted that you would get 100 percent of everybody would be, say, a fireman.

So what we did is we are going to hold the PSWAC region where most of their data was, in the metropolitan areas, and we are going to affix a break point to it that corresponds to our other data sources for the rural areas and use those together to model the number of policemen over the wide range from rural to extremely urbanized areas, because we need to do something that works across the country.

We did a similar thing for fire data. We have a whole lot of data for a lot of public safety and public service services within New York State. So we looked at some fire data, which you see plotted there. Then what we did is we modified the slope of the PSWAC curve.

The PSWAC curve, before it had no data to the left of that line that you see right there. Since most of our data falls there, what we have

done is we've essentially modified the slope of the PSWAC line in the areas where we had more data than was available under PSWAC. So what we have is basically a two-slope model that tends to fit the data over a wider range of population density.

The EMS population model, you run into exactly the same thing. Originally, there was no data to the left of that point. We have more data available, so we affixed another break point to that model, which essentially holds the population of the EMS per unit population constant over a certain level.

Once we have a National Capacity Model, one of the things we need to do is, for all these counties that are going to get pool allotments, we need to characterize a couple of things about them. We need to characterize their service areas, where they are protected from interference, and we need to kind of generalize a range of area over which they will cause interference.

So for each county what we have is several polygons or contours associated. We have a

service contour, what I call a service-plus contour, and an interference contour. The frequency assignments that these pool allotments are going to be based on are based upon nine intersections of these contours. They are a concept that we are long familiar with. We are looking at the interference-to-service-plus intersections, and vice versa, on the co-channel basis.

On the adjacent channel basis, one of the assumptions I am making is the service contour, which is the county boundary itself, can interfere with the service-plus contour, which is a county boundary plus "X" amount, plus three to five miles, depending on some factors.

Basically, what that does is that assumes that the 60 dBu contour for counties within the county boundary, which generally is going to probably be the case, unless we decide that that county plus three goes to 50, and then we would probably have to take a second look at it; I think that that relationship will still hold.

Basically, all it says is, if the county

doesn't share a boundary -- a county can't share an adjacent channel assignment with any county that boundaries it, basically. With the kind of adjacent channel rejection that we are seeing at 700 MHz, that is a pretty conservative assumption.

The service contours are represented by each county's political boundaries. That is really the service area that all the agencies work over, and those boundaries are based upon Census data.

The service-plus contours will be represented by the political boundary plus the buffer zone that I mentioned. In the past that has been kind of referred to as the 40 dBu contour area. From this morning's conversation, that may be a 50 dBu contour area. It really doesn't matter so much.

One of the things that does matter a bit is what the size of that buffer zone is. From Appendix O within the Implementation Subcommittee report, I mean they talked a great deal about the need to switch between three and five miles outside of that and the justifications for doing that. So we are going to do that.

What we haven't decided at this point in time is, what is the break point for doing that? How do we measure the urbanization or what population density do we say, okay, we need to all of a sudden switch from a three-mile buffer to a five-mile buffer?

That really is the rationale for driving this, the need for increased -- the five-mile buffer is truly there to try to meet portable and in-building coverage requirements within the service area. Again, you can go to Appendix O and read quite a bit more about that.

The interference contours are the real meat and potatoes of this whole thing. They account for at least two very important parameters, and they need to be completely generalizable across the entire country.

First, they need to account for the size and shape of each one of those counties that it is representing, and, secondly, since we are using the terrain to try to effectuate better frequency re-use, we need to take that into account.

Accurate interference contours, and in fact accurate contours in general, have been notoriously difficult to produce. Several of us have worked in TR8.18 for over a year trying to come up with a better way to do these kind of contours. There's a whole lot of proposals we looked at. They all were good over a limited range of cases, but in the end there's really no general purpose method that could be selected.

Basically, if you need that kind of detail, you kind of need to go to a contour-based model because going to contours opens up a whole bunch of questions as to what the contour actually means. Every contour that has a different meaning has a different effect in terms of loss of reliability or loss of coverage.

I wanted to get a preliminary methodology done before this, so I can get some feedback. So I will describe what we have here, what appears to be giving very good results, at least in my opinion. It utilizes both the terrain and shape of the county.

Now I say this looks like it is giving results, in my opinion. Over the last six months I think that we have been through enough regional planning activities, and we have looked at thousands and thousands and thousands of contours for all the regions in New York, trying to work through the regional planning application for the State. These contours look to me like they are doing exactly what is expected of them.

It is a two-stage approach. Basically, you generate a terrain-based contour or a set of terrain-based contours, which I will talk a little more about. Then you generate a buffer region around the county. This final interference contour really is the union of both of the above.

What you are trying to do is you are trying to give a buffer region that always gives you protection around the outside of your county, because, again, we don't know where any of these sites are. We don't know where the transmitter sites are. Yet, we are trying to predict the interference potential from them. It is kind of an

interesting problem.

The interference contour that is based upon the terrain, what we do is we ray trace along each radial, either 180, 360, it doesn't really matter, and we compute propagation losses at each point along the radial. So, actually, we are doing a radial propagation model.

We assume a couple of things. We assume a worse-case scenario. In other words, that transmitter is located at the highest terrain elevation point within that county or the highest terrain elevations over that county. We will talk a little bit about that near the end, when I talk about modifications.

We assume that at the highest point of terrain elevation it is 100 foot antenna height, or AGL, and it is putting out 250 watts. The antenna height is a little low, but because it is at the highest point in the county, I think that that is a reasonable assumption, and the ERP is generally what you see.

We are also assuming an omni-directional

pattern, regardless of where in the county that antenna is located. A lot of times the high points of the county are actually located right near the county boundaries, which in real life you wouldn't have an omni-directional antenna.

For propagation losses, we are going conservative here. We look at primary obstacle knife-edge diffractional losses, which I can explain, but basically it is a conservative method. We use an Okamura-Hata-Davidson open model to predict the basic path loss before the diffractional losses are added to it.

The extent of the contours that I am going to show you basically represent the point where no more than 1 percent of the points along each radial exceeds 5 dB. But what that really corresponds to is more an area reliability metric than a contour reliability metric, if you think about it. Because of that, in terms of a contour, it is about 3 percent points greater than 5 dBu at the contour, based upon a model that is kind of a general model to apply towards that.

At no point is this interference contour going to go more than 120 kilometers or 75 miles from the boundary. The expected reliability that you get based on that contour alone is pretty high. The security and interference that you are expecting to see based upon that to the 40 would be on the order of about 48 dB, meaning all you are really caring about is a carrier-to-noise-type problem. That gives about 96 percent higher reliability. I can go into more details about that later, if anybody is interested in that. It is conservative, as I said.

There's no land-use/land-cover losses that are often applied. We are using 30-second terrain in here, which is going to underpredict the propagation losses, but because we are looking at interference, that is not a big resolution problem.

We are looking at the primary obstacle loss, where in many cases you will have multiple diffraction losses, and we are looking at knife-edge diffraction which also has lower losses than the rounded-edge-type diffraction, which you would see

in other models also.

But we really need to be generalizing these things. We need to be conservative about these things when we are trying to generalize things, because, again, we don't know where the sites are. The site could be somewhere else, and we still need to kind of capture the effect that that terrain is going to have and still give protection.

I might note we also have that 50-kilometer buffer. Basically, that is there to provide isolation between co-channel assignments, regardless of what the terrain contour even says. If the terrain contour says you can provide co-channel re-use within 25 kilometers, it is still not going to allow it. It is still going to put a buffer zone there to try to protect against those cases where that antenna could be moved anywhere or other effects might come into play.

We can't really place the sites in all possible locations within every single county and propagate them out. That's an intractable problem. It wouldn't give you any better representation of

what's going to happen in reality anyway.

So, at a minimum, you are always going to get at least 35 miles of separation between the service areas. That is worse case. You are probably going to see at least five miles more than that. It is worse case because they are your service area transmitters. If that was true, you wouldn't have an omni-directional pattern, for one.

But what it does say is that for all 700 MHz regional planning we really need to keep our radiation patterns under control. Whatever we do within our service areas as far as power levels, whatever level of coverage we need as far as portable and in-building, we still need to keep our interference contours as closely-bound as we can because spilling that stuff out all over just basically takes the use of that spectrum away from everybody else.

Again, the final interference contour is the union of these terrain contours possibly and the 50-kilometer buffer. One example of kind of the contours you get from that would be here, where you

see the service-plus contours, the dotted line there around the county. The county boundary itself is in the middle, and then you get a terrain-based interference contour going outward from the highest point of that county, which is kind of flat.

But you can see the terrain contour basically -- it's kind of hard to see, but it predicts the interference pretty well. It dies along that ridge that you see north there and also on the higher portions of the ridge up north. It takes terrain blockage into effect pretty well around there.

You notice that the southeastern portion of the county, though, that interference contour isn't doing much. So that's why that buffer contour comes into play, and you combine them together to get both the worse-case interference and the highest elevation point as well as some kind of buffer or separation between assignments always.

As I mentioned earlier, I have brought a whole lot of results. I plan on talking to a whole lot of you. I have results from Northern and

Southern California, New York, Missouri, Washington -- I don't see Kevin -- Florida. There's several people from Florida I want to go over these with. Nevada, Illinois, Colorado, Arizona, Virginia, and Michigan.

If I don't get you guys here today, make sure you talk to me, and I will get you these contours on CDs, because I really want to get feedback from you guys on how well you think they are showing interference potential for the local commissions you guys got. That feedback is very important because modifications to the model I would like to make as soon as possible, so we can get this data pack in place, so that the regions have it available to them.

We can go over this in detail anytime this week, today or tomorrow, and I will send you those CDs, if anybody really wants to look at them.

One thing I will note is there's already some improvements that I am implementing right now. One of them is increasing the number of these notional site locations within the county. Out west

there's some very large counties. So instead of picking the highest terrain elevation point, it may -- I'm not completely convinced of this yet -- but it may be more prudent to pick the highest elevation point and then don't look anywhere within, say, 50 kilometers of that, then pick the next highest elevation point, until you have completely blanketed the county. Then take the union of all those interference contours as the county thing.

I think you are still always going to have to have a buffer zone as a union to fall back on because you still can't put a site every single place. You could put a site at a lower elevation that just might peak this way and might get interference down to another county that you wouldn't get at a different location. It is a very hard problem to generalize.

I am also looking at the utility of artificially increasing terrain elevations for some areas. For example, the cities of St. Louis, New York City, any city, you name it, going to the highest point in the city and putting a 100-foot

antenna doesn't probably reflect reality. Probably that antenna is on top of a 40-story building in the middle of the city and the city is pretty flat. So that is definitely something that I probably will be looking at doing.

I am also looking at the utility of increasing the transmitter height for flat counties. In a lot of areas that are very flat, they don't go to 100-foot antenna designs; 700 and 800 MHz designs will work very well with large antenna heights, maybe on the order of 300 foot. So that is something I certainly want to look at for those counties, to make sure that we capture the interference from those well enough.

That is all I was really going to go over right now. Again, I am available later. I will make this information, the more detailed information, available to anybody who requests it. You can call me at any time with more questions, and I will take some questions now, if anybody has them.

MR. BUCHANAN: Dave Buchanan, County of San Bernardino.

I was just curious, the fire model, correctly, there are more firemen in a rural area than in an urban area per number of population. Did you kind of modify that any because, generally, there's also less calls for service, and therefore, they need less channels, even though they have more volunteers?

MR. O'HARA: Well, what happens is you still have less firemen in general. It is the percent per population, and in areas where there is less population that percent represents less firemen also.

MR. BUCHANAN: Okay. I just wondered if you looked at it. I didn't think there was any easy way to correct for it.

MR. O'HARA: To some extent, in areas that are very lowly populated, all of those models are basically going to flatline. In other words, they are going to predict so little capacity that what's going to happen is those five channels is going to be fine. There's counties with 500 people in them. There's counties with 1500 people in them.

Five 25 KHz channels is the equivalent of 16 voice slots plus a quasi-wideband data channel. So that's plenty of capacity for a county like that.

So I think when you get into the really rural areas, what is going to happen is the traffic models are almost going to become useless -- well, not useless, but it's not going to be dependent on anything except for those five channels.

With that, I will turn this back over to Ted.

CHAIRPERSON DEMSEY: Thanks again, Sean. It was a good job.

Going back to the agenda now, we are going to get an update on DTV transition from Dave Eierman.

MR. EIERMAN: Not a lot to report that helps us. There was, I guess, an edict that came out of the FCC that television tuners will be required, television sets will be required to have DTV tuners in them starting with 36-inch sets by, what, 2004, and going down to a smaller size over the next couple of years, with the hope of

increasing the penetration rate of over-the-air reception or receivers out there that have to have DTV tuners in them.

Next week the House Energy and Commerce Committee is, I guess, having hearings on the remaining DTV issues. You know, there are some other issues that affect the transition: the cable carriage issues, interoperability issues, copyright protection, plus the TV tuner issue. So Congress is again interested in this, and I guess Billy Tauzin is again proposing some congressional legislation affecting this.

Canada, I guess since -- I don't know if I reported this in June or not. They have defined the DTV transition for Canada, that they are going to transition to DTV, and stations can start putting DTV up on their proposed allotments. There is no timeline. I mean, it's voluntary migration with no endpoint at the moment, which parallels the fact that Canada has said that eventually they will transition into land-mobile-type services and make land-mobile primary, but again there is no timeline

for doing that.

That's basically it.

MR. SMITH: Ray Smith from the State of Ohio.

Dave, I was wondering, I've come across some information that there are pending applications for low-power television stations in some areas, and there appears to be one in Ohio.

MR. EIERMAN: Lots of low-powered TV stations in this band --

MR. SMITH: These are new. These are new, reasonably new.

MR. EIERMAN: Yes.

MR. SMITH: I am wondering, do we know where that stands with the Commission? Are they allowing these low-powered --

MR. EIERMAN: They're secondary.

MR. SMITH: That's fine and dandy until 2006.

MR. EIERMAN: Well, actually, before that. My interpretation of the way the rule was written is they are secondary, and until land-mobile

actually constructs and comes on the air, they can continue to operate, and even after that date, they could continue to operate as long as they don't interfere with the primary service.

So like the State of Ohio was given a blanket license for State channels.

MR. SMITH: Right.

MR. EIERMAN: If they were to go out and construct a site and there was a low-powered TV station interfering with that coverage, then you could go back and request that they modify their coverage or cease operations because they are secondary and interfering with a primary service.

MR. SMITH: So, basically, instead of prohibiting those to come on board after it has been set aside for public safety, they are allowing them to continue to come on board, and then public safety has to go and challenge at a later date. Is that what it boils down to?

MR. EIERMAN: My gut feeling is that is basically what is going to happen. I mean, there are still power stations out there that have valid

applications that have never been granted a permit to construct also. I mean, there's probably 50 to 100 of them, well, probably more like 50 in the United States.

MR. SMITH: I'm wondering about the motives.

MR. EIERMAN: My interpretation and discussions we had about this topic three or four years ago was that they are secondary, and if they interfere, you should be able to go back to the FCC and have them modify their operation. I mean, they have had six-plus years' notice that this was happening.

MR. KNIGHT: Curt Knight, State of Arizona, Department of Public Safety.

In similar issues to Ray's in Ohio, we are seeing low-power TV come on the air in the last couple of months. When the applications or when the licenses were actually granted, I can't tell you that, but they are now generating their market.

I guess my concern is, how does, then, a regional system or a state government, a city

government, then in turn displace that TV market once it is established? It seems a backward process if you are asking that regional system to then go to the FCC or even go to the TV market and tell them they are going to be displaced. If they've had six years to know, why didn't the FCC allow them to do something else rather than come on the air in that spectrum is the concern.

MR. EIERMAN: I understand. I mean, I understand. This has come up several other places, too. I understand the question. I don't have the answer.

But going back and reading the docket, my understanding is land-mobile will be a primary service and should be able to force them to vacate it, once you have constructed.

CHAIRPERSON DEMSEY: I'm going to ask Bette Rinehart just to give us an update on the Policy Group.

MS. RINEHART: Okay. This Working Group made some changes to the Guidelines based on the Fourth Memorandum Opinion and Order in 96-86.

Pretty much what it did was just change some of the footnotes, to take out the verbiage that said that this was pending the decision. Most of it is just cosmetic changes, and it is in the footnotes primarily.

Also, we added some definitions of the word "channel" and the word "allotment" and "allocate."

The other thing that the Subcommittee did was revise the Interoperability Table, which is Appendix A of the Guidelines. That was also based on the Fourth Report and Order and Fourth MO&O. There's a copy of that in the back.

Unfortunately, there's the wrong version of the Guidelines back there, and I will be sending out the appropriate version. When you pull it up in Word, the changes will be in red, so they are very easy to see.

If anybody has any suggestions or additional changes, send them to me through the listserve. I would like to have them by the end of the month. I want to get it out to John Powell, so

that he can put it into the Guide Book that is being distributed to the Regional Planning Committees.

CHAIRPERSON DEMSEY: Thank you, Bette.

From our Technology Committee will be Ali Shahnami.

MR. SHAHNAMI: Not much to report also, except since I also am a member of TIA TR8.18, which is Bernie Olsen's group, when e-mail came from, I think it was you, Ted, contemplating the channel loading concept and whether we should revisit it and come up with another one to reflect maybe the real world, I took it to our Committee meeting last time. To be honest with you, TR8.18 decided not to address it. At that moment, I think Wayne as well says they wish not to address it at all.

So if you ever think of going to a TIA official, don't because they said at this time they don't want to address it. It's not something to talk about now, which will concrete for channel loading.

As for 50 dBu contour, I think you are going to talk about it under old business, but I

think it os still at the TIA for analysis because there are a lot of issues, how it is going to affect the systems and coordination as well, and implementation of the base stations.

That's basically it.

CHAIRPERSON DEMSEY: Thank you.

Just again to kind of clarify that, when we did bring up the issue about the loading criteria, it was just for the regional planning process. There was no intention to ask the FCC to change any of their rules. It was just guidelines and looking at new technology and wider bandwidths and wider channels, and more throughput.

Was there really a need to look at new loading criterias or should we just leave it alone? Typically, public safety ends up overloading their systems anyway. So it, again, is just a guideline for the RPCs. So we don't want anyone to think that we are trying to get the FCC to create any additional mandates.

MR. SHAHNAMI: Since this is for regional planning activities, back in the PSWAC time

Dr. Stone, who works with INS, did come up with a position paper that did, if I am not mistaken, a detailed analysis, traffic analysis of channel loading for public safety.

CHAIRPERSON DEMSEY: It is in their final report.

MR. SHAHNAMI: Right. If you have the CD or I can just get it and send it, but that might be something just to allude to, cut and paste, and send it to regions as "FYI," and if they want to follow it up or just read it or use it, that would be their prerogative.

CHAIRPERSON DEMSEY: That's not a bad idea.

Dave?

MR. BUCHANAN: Just a quick comment: We discussed that quite a bit, if anybody wasn't here during the Technology Subcommittee, and we are still looking for input for wideband data loading. We haven't found much. So if anybody has anything, we would like to know about it, too.

MR. TOLMAN: Well, I guess I'm going to

follow suit here on not much to report with regard to the Funding Working Group 5, what we're calling Working Group 5, except that having gone through summer months, it has extended our schedule of moving out on this.

But with regard to the Funding Working Group, we have a plan underway, or we are working on a plan, to work with the PSWIN group and working with Rick Murphy to team up again, which was done in the earlier days where we had teamed up, to keep this Working Group alive, as we have new information that comes in.

Right now we know that, from the federal perspective and with regard to funding, it is still very volatile right now. There are some large numbers floating out there that have a destiny to public safety and some promissory, shall we say, commitments.

But, anyway, the plan is we are going to, we want to keep this Working Group alive, even after this portion of the NCC and this term limit is up, that it comes to closure and that it would find

its way, what we are proposing, as an ongoing Working Group with the NPSTC.

Other than that, I don't have anything else to say.

CHAIRPERSON DEMSEY: Thanks, Tom.

MR. TOLMAN: Just for point of reference, on that traffic profile and grade-of-service recommendations that Greg Stone did, that is on page 686 of the combined final reports for the Public Safety Wireless Advisory Committee. It's page 80 of the Spectrum Requirements Subcommittee, which is the same as page 686 of the overall report.

CHAIRPERSON DEMSEY: Okay, I would like to go back into the loading criteria discussion. I would like to, at least for today's meeting, come to some kind of consensus relative to whether or not it is important to pursue this to the degree or if we can just leave the channel loading requirements as they are in the present Guidelines.

Then by the next meeting or the meeting after that, if it does change or we decide to change it, I don't think it is a critical issue. I think

we are far enough away from implementing systems and getting plans approved that it is not a critical issue. We don't have to solve, but at least I would like to get some kind of consensus today on whether or not it should be changed.

MR. DEVINE: Steve Devine, State of Missouri.

Just as a planning tool, I think the value that was arrived at earlier I think is a good start for people. Maybe what needs to happen is we need to throw out the wrong number until we get more information to provide us to maybe achieve the right number.

When looking at the current environment, the 180 probably is more right than wrong, and for a 50 KHz channel it might be a good place to start. If there is a correction needed, I am sure it is forthcoming.

MR. SCHLIEMAN: I would make an observation -- Robert Schlieman. The earlier analysis referred to busy hours, and the peak activity is kind of the limiting characteristic of

what you can stuff into a channel without causing a backlog.

I think perhaps we need to get a little more definitive information on the 5,000 megabits per user per shift, to better understand the distribution of that activity.

MR. EIERMAN: Are we discussing wideband or narrowband loading?

CHAIRPERSON DEMSEY: Both.

MR. SCHLIEMAN: Both.

MR. EIERMAN: The reason I bring it up, there's two separate topics. The only thing that is in the Guidelines at the moment is what was pulled from the NPSTC Guidelines for narrowband for 100 mobiles for voice, 100 mobiles per channel or 200 mobiles per channel for data.

Yes, we need to also define that for the wideband loading at different channel bandwidths. What had been questioned before was the narrowband. Those numbers were set close to 15 years ago based on data probably taken in the late seventies, early eighties, based on single-site SMR systems probably.

Voice-loading profile on a single-site system, it is much different than the voice mobile loading on a multi-site system. If any of you have multi-site simulcast or multi-site, multi-carrier systems, you know that when someone keys up on one site, they actually bring up channels at multiple sites in a talk group. So that multiplies the loading.

The question that I had that started this, I don't know, two or three meetings ago was: As a ranking criteria, is 100 per channel for voice valid the way we design systems today, not the way we designed systems 50 to 20 years ago?

The same issue for mobile data, the mobile data profile that drove 200 mobiles per channel 15 years ago was much lower data throughput than what we are expecting to go through on 12.5 or 25 KHz channels in this band today. You know, we are talking about 5 megabytes going through a 50. My gut feel is we are probably talking something approaching 1 megabyte in a shift going through a 25 KHz channel per user.

So the question is, is the loading profile of data units the same as it was or different than it was 15 years ago? I don't readily have available data on what those numbers are right now.

There's another issue of now there are going to be people offering integrated voice and data, a radio that can do voice or data or both. I think the e-mail trail on the listserver I think probably answered this question. The FCC is probably going to consider -- you can't consider a unit twice. If it is going to do voice, you can only count it as a voice unit, even though it does additional data. You can't count it as a voice unit and a data unit.

So a physical unit can only count once. The assumption is it can't be doing both voice and data at the same time, so it can't load higher than one unit. I don't know that I agree with that, but that was some opinions that came out of the FCC when people -- I think it was Florida -- had investigated this earlier.

My major concern is that the profiles have probably changed. We shouldn't just pull numbers out of the NPSPAC report, NPSPAC Guidelines from 15 years ago, and possibly just throw them in here and expect them to be used the same, because the learning profiles and the equipment have changed.

CHAIRPERSON DEMSEY: I would just like, I guess, to get consensus that we believe in the Implementation Subcommittee that there is a need to revise channel loading guidelines for both wideband and narrowband data, and that we are going to look at the different bandwidths in the wideband and make recommendations for both wideband and narrowband.

I think we have consensus. I'll go to the Glen Nash method of nodding heads.

Hopefully, we would like to try to have the recommendations to the Steering Committee by November, by the November sessions in New York. We will try our best.

The next issue I think that we need to discuss is the 50 dBu issue. We have had some

discussions amongst ourselves. Me being not an engineer, but been involved in building quite a few systems and planning them, I think that we need to be very careful about this issue because it is going to have a ripple effect throughout all of the systems that are being designed.

If we are required to raise the noise floor, as we have discussed before, it is going to require re-engineering of systems, possibly adding a lot of sites to systems. In an unfriendly environment such as an urban area like a Los Angeles or New York City, the effect is going to grow exponentially, just by that 10 dB change.

We are all aware, at least everyone here in this room is aware of it, but we want to just make sure that we make the right recommendations from this Subcommittee as to how it should proceed, especially when it affects the planning process that we are charged with making recommendations for.

I would just like to get some feedback from -- I know it has been discussed in other committees, and it does affect our Committee only

because we have to use those Guidelines in the planning process.

MR. SCHLIEMAN: If I could express some comments, as was pointed out earlier, mobile systems require higher level of signals. They might be mobile-only systems and able to work with the 30 dBu signal threshold as a design minimum for their particular jurisdictional area.

It has been suggested, and I believe Technology will recommend, that the urban areas that have higher levels of interference, higher noise levels, will probably want to go to a 50 dBu signal threshold, that it shouldn't be a mandatory requirement; it should be a goal.

There are many ways of getting in-building coverage. One is to get as much signal outside the building to penetrate the building. Another way is to put the signal inside the building instead of trying to force it through the walls.

These are design issues. They all have cost tradeoffs. We did some preliminary looking at three counties in New York State of differing

geographic characteristics. In no case was there less than a 2-to-1 increase in the number of sites required to go from 40 to 50 dBu.

CHAIRPERSON DEMSEY: Less than.

MR. SCHLIEMAN: There was no case that you didn't have to have more than 2-to-1.

CHAIRPERSON DEMSEY: So it is effectively doubling your --

MR. SCHLIEMAN: More than doubling.

CHAIRPERSON DEMSEY: More than doubling.

MR. SCHLIEMAN: And that brings into the picture the environmental zoning issues that jurisdictions have to deal with, putting in more towers, putting towers where they aren't on government land or facilities, and all of those issues, in addition to the cost.

CHAIRPERSON DEMSEY: I think Glen also mentioned before, he used the terminology, a "cheaply-built system" or maybe the designer was being cheap or the agency was cheap. Budget constraints are going to be very important. I know that it is hard for us to consider that from a

technology aspect, but from an implementation aspect it is important that we do consider that the systems that we are trying to design have to be able to be built also. That is going to be a problem.

If you've got to double your sites for in-building coverage based on a change in the threshold, a lot of systems aren't either going to be able to achieve the coverage that they want or build the systems that they want.

MR. SCHLIEMAN: I also made a 50,000-foot analogy of polluted rivers in the seventies and polluting our spectrum today. I think everybody has heard it before, so I won't repeat it.

MR. PALMER: Clark Palmer, Washington State.

I think at least in the legislative bodies I work with during the budget beg, it will become a tradeoff between system design funding and associated risk. The question will be, is the doubling in cost worth the associated risk with the 10 dB? For a legislative body, that is going to be a tough discussion to have because they are going to

be balancing a lot of different funding issues, too.

MR. EIERMAN: I go back to the reason for this topic coming up was the issue of the FCC asking TIA about the issue of raising the noise, you know, CMRS raising the noise floor by 10 dB, and what would that do to public safety systems? Would they have to be designed to 50 dBu versus 40 dBu?

You are talking about risk. The risk is that if you continue to design systems at 40 dBu and you've got about over 30 dB carrier noise or carrier interference protection, and CMRS comes in and raises the noise floor by 10 dB, now you only have 20 dB. You have significantly reduced the reliability.

This is the basis of the Nextel 800 interference issue. I guess the basic question is, raising the signal levels by 10 dB, besides the cost factor, would that resolve most of the CMRS interference issues such that you could basically go back and ignore it and design systems ignoring the fact that CMRS is in the adjacent band again?

MR. KNIGHT: Curt Knight, Department of

Public Safety in Arizona.

Another 50,000-foot view possibly: We were talking about the doubling of the number of sites to protect against potential interference, but we need to remember also that the majority of the users who hopefully will be taking advantage of the 700 MHz spectrum are migrating from a noise-limited system in the VHF or UHF bands.

MR. EIERMAN: I would be surprised to find a noise-limited system in VHF.

MR. KNIGHT: But they are migrating from that spectrum, and there are certain issues that would say you are already doubling the number of sites to provide a similar coverage towards that 700. If you have to double it again to protect against potential interference, then you are soon reaching the point where it is not economically feasible for a lot of jurisdictions to even consider 700 MHz as a solution. So we are making a real mess of that, I would think, if we are continuing to increase our power demands just to make the system work.

CHAIRPERSON DEMSEY: We will continue to work with Technology and try to keep everyone abreast of the issues. Then we will modify our recommendations based on what the final outcome is, obviously.

MR. EIERMAN: I mentioned it earlier today, that we are in the process of reviewing what changes have got to be made to the Guidelines based upon what has happened since May of 2001, when we published the existing ones that are on the NPSTC listserver. I guess they are the same ones that John Powell has reorganized into the CDs and all that stuff, right?

CHAIRPERSON DEMSEY: Yes.

MR. EIERMAN: So any changes we make affect not only the original document, but the documents that are going to get distributed to the RPCs. Tom and I were having a discussion earlier about whether they even publish now. My recommendation was go ahead and publish, but basically tell everybody that, when the NCC is over in February, there will probably be an update

immediately with any final recommendations and changes.

CHAIRPERSON DEMSEY: Yes, I think we will work with NPSTC in making those available. I know John's format is very easily modified just by taking pages out and putting them into the Guidebook.

I don't think we are going to issue changes other than on the website, just make a notification that on the website the changes are available and to download them. That is probably the most efficient way to do it.

Region 5, Dave Buchanan's plan, Region 5 has been submitted to the FCC. Michael, I don't know if it is appropriate to ask if there's been any progress on the review of that plan?

MR. WILHELM: It's appropriate to ask; I just don't know the answer.

(Laughter.)

I don't handle that end of the business.

CHAIRPERSON DEMSEY: Okay. I am only asking because we are anxious to get some feedback

from the FCC. We have a checklist which I am just going to e-mail to Michael tonight that we had developed about two months ago when we spoke about it.

We had hoped that maybe there would be some feedback from you guys, so that we could kind of coordinate our checklist with what the FCC is thinking. But I think I am just going to give you what we did so far, and then you can use that. Hopefully, it will help you.

MS. KOWALSKI: That would be very helpful. I think we have an early draft of that checklist. There is a team that is trying to use the Region 5 plan as the basis for developing something that is internal to the Commission, which will be the guideline that we will evaluate future plans on.

So we are taking more time than some people would like us, only because this is more difficult than the 800 plan review process. We want to get it right the first time. Before we go back to Region 5, we want to make sure that if there are

other questions or if we need some more information, that we do it one time, unlike ULS, just one time and get everything, get all the questions.

But this is a priority. I think the Division Chief has told Region 5 that they can expect this, some kind of a response concerning the plan soon.

(Laughter.)

CHAIRPERSON DEMSEY: That was a good answer.

I think we are primarily concerned with, if there are things that the FCC finds wrong with the plans or the guidelines, that we are able to get those out, obviously, to get them out to everyone and then get them to NPSTC, so that they can revise the Guidebook also.

I think all of us on the Implementation Subcommittee are available. If there is anything we can do to help, just let us know.

Is there any new business?

MR. SCHLIEMAN: Yes, I wanted to talk about the state plan.

CHAIRPERSON DEMSEY: Yes, I'm sorry, I forgot. Yes, I'm sorry.

MR. WILHELM: While he is working with his computer here, I will make a brief announcement. There will be a reception tomorrow morning at 8:45 for the NCC sponsors, the Steering Committee members, and the Subcommittee Chairs. It will be immediately behind the Commission meeting room. It is the same room we have used previously.

We are looking forward to seeing all of you there. You will go through the same security procedures as you did this morning. There will be two FCC staff people at the door to escort you to the room.

MR. TOLMAN: I would like to ask Dave Funk to come up to the mike, that one over there, Dave Funk, and give us an update on the pre-coordination database, specifically the RPC planning classes that have already begun.

MR. FUNK: Dave Funk, NPSTC Support.

Classes have begun on the CAPRAD database. We have had one class already. The next class is

scheduled next week. October we'll have another, and in November we'll have another. They are all full. RPCs have signed up for those. The notification was put out in the NPSTC newsletter, and we will announce the schedule for the training that will occur after the first of the year as soon as I can secure that with the University.

We are using the labs there, so that everybody has computers available, and we actually go online. We have instituted a training packing plan that we put in place into the training side of the database, so that students can actually see what it will look like and what it will do. So all the functionality is there, and that is underway and ongoing.

MR. TOLMAN: This NPSTC newsletter is one of the mediums that we are using to provide updates on the status of that as well as other things. In fact, I guess we should have brought them here today. If anybody is not getting that and would like to get it, see Dave or myself.

MR. SCHLIEMAN: Steve Devine and I have

been working on border sharing plans for 700 MHz state block channels. He has a cellular approach, and we have a somewhat different approach.

This just gives you some background. From the 24 MHz of the 700 MHz public safety band, 2.4 MHz is designated as state-use channels. A lot of the states in the Northeast have received their license for all of the allocated state spectrum. So, of course, we have an interest in that.

State licenses are granted as geographical area licenses bounded by the state boundaries. The FCC has given the states the responsibility for their own use of the spectrum. Therefore, to avoid interference, cooperation on channel use at the borders needs to be addressed by the states, and that is a requirement that is in the Report and Order.

Interior areas of the states beyond the border regions may use any of the state's geographically-assigned channels. New York is developing a proposal for State geographically-assigned channel use along the borders of all

northeastern states.

New York recommends that an MOU, a Memorandum of Understanding, be used to clarify the understanding between states. The MOU, as proposed for this application, will cover state use channels at the borders of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, and Vermont. Each pair of states would have their own MOU.

The 2.4 MHz of state license spectrum consists of 192 channel pairs, base and mobile pairings, at 6.25 KHz wide channels. The 192 paired channels are a subset of the 960 total 6.25 KHz paired channels that comprise the narrowband segments of the band.

The state channels begin with Channel No. 25 and end with Channel No. 948, referring to the fixed-station channel numbers. The 192 state paired channels will combine into 48 individual 25 KHz wide aggregated channel sets.

An aggregated channel plan of 25 KHz was chosen so as not to inhibit the use of future

technologies. And that is a question you were asking earlier. The aggregated channels can easily be reconfigured as 12.5 KHz wide channels, for a total of 96 paired channels, or you can operate any of them, 6.25, 12.5, 25, as you wish.

The 48 paired channels are segregated into 12 LATs, core groups. Each group contains two channels from TV 63 paired with 68 and two channels from TV Channel 64 paired with 69. Each channel in a group is separated by a minimum of 250 KHz.

The proposal names the groups A through L. All groups experience the same television interference effects because the interfering television channels are equally represented within each group. This chart shows the proposed channel grouping and refers to the channel numbers using the fixed-station channel number.

In this chart here the example is Group A, made up of four 25 KHz plan channels. Each of the 25 KHz plan channels is made of four aggregated 6.25 KHz FCC channels.

Super-groups or combinations of groups,

by design grouping in these super-groups, we minimize the possibility of interference and maximize the amount of state-use channels that can be utilized at the borders. Note that this plan contemplates a 25-mile border zone within each state's boundary, as described later.

Along the Canadian border, a similar arrangement is suggested, but international sharing in this band has yet to be negotiated by the U.S. State Department and FCC, at least as of July 28. I don't know if there has been any forward motion in that area.

The groups are combined into five super-groups. A super-group consists of four or six groups. An example of a super-group would be A, B, C, D, E, F for Super-Group 1 or G, H, I, J for Super-Group 3.

Super-groups can be allotted by counties within a state or by geographic coordinates. This table lists super-group assignments as proposed for this Northeast application. We think that one of the simpler ways is to do it by county. Our

counties are generally a lot smaller than in some of the states.

This table shows the super-groups and the states all along the adjoining borders. Like most of the shared, common border between New York and Pennsylvania, Super Group 1 is allotted to New York, and Super-Group 2 is allotted to PA. Near the border area of New York, PA, and New Jersey, Super-Group 3 is allotted to PA, Super-Group 4 is allotted to New Jersey, and Super-Group 5 is allotted to New York.

In the region of the New York, Massachusetts, and Vermont border, Super-Group 1 is allotted to New York, Super-Group 4 is allotted to Massachusetts, and Super-Group 3 is allotted to Vermont.

And in the next slide we have a map that shows the super-groups to see how they match up across the respective borders. Super-groups allotted to a state can be used within a 25-mile buffer zone along the border regions. The 25-mile buffer zone was deemed reasonable based upon

simulations employing directional antennas and radio horizon calculations, transmit height of 150 feet and a receive height of 6 feet on the mobiles. Sites within the buffer zone can have their 40 dBu contour or service contour extend a distance of five miles beyond their border.

This map shows the border regions. You will notice that some states have very large interior regions, and some states, like Massachusetts, only have a coastal range, where you are more than 25 miles from an adjacent state border.

Color coding is a little difficult. The yellow line, representing the 25-mile interior boundary, is a little hard to see against the green background, the light green background, but I think you can get the idea.

The lower orange circle, or dark yellow circle, represents use of a site within the border region that's extending over five miles into the adjoining state with 40 dBu contour.

The blue site is in the interior of the

state, and its interference contour of 5 dBu only extends up to its own state's five-mile line within its border, to illustrate how these sites would be planned out.

Let me go back a couple. Using these combinations of channels allows a state to do whatever they want to do. There's no restraints on where they are going to put stations or anything like that. It is just a case of they would be able to do it with these groups of channels.

In our approach, we offer that kind of flexibility because, with the terrain that we deal with, particularly mountainous terrain along the Pennsylvania border and the Vermont and Massachusetts border and the rolling terrain between New York and Connecticut, since mountainous to a lower level, certainly hilly terrain in terms of what the guys in California think about, but, nevertheless, at 800 it's a mountain. It gives us flexibility on how the stations would be located.

Now, Steve? Where did Steve go? There he is.

CHAIRPERSON DEMSEY: I just made a comment that Bob and Steve are starting to look a lot alike now.

(Laughter.)

MR. DEVINE: Look at that. That worked out well. See how easy mine worked, everybody.

(Laughter.)

Okay, this is fairly impromptu.

What we addressed in Missouri regarding the same issues -- I'm going to go through this a little quicker. Bob went through a lot of the parameters.

The key issue here is these are licenses that have already been issued. So the Commission has done their job. They have given us the flexibility to implement these. Now we have to, in some cases, address some issues that have gone on for years with regard to border areas, and now the key is to make them work. We have already been issued the license. That is sometimes the more difficult part, but in this case now we actually have to get along.

Some of our goals for establishing this in Missouri, we have eight adjacent states, some of which have greater border areas, some of which are populated, some of which are sparsely populated. To establish a channel allocation, whether or not we build a State system or not, with no incumbency at 700, I might add, this still remains to be seen.

But maximal spectral efficiency, I don't think we meet the efficiency level that Bob's contour-based system would, but we certainly think that it is effective in many of the areas we are looking at.

Also, the third comment there is to preserve the adjacent state border areas for states that may -- "delay" is probably not the best term -- just not implement initially, and perhaps to preserve some border areas for later implementation might be beneficial.

Some of the things we learned: that we are diverse both in population and topography, which goes pretty much for the whole Midwest. The formula for channel re-use needs to be implemented, and

state government will end up leading any wide area initiative.

We see this as being a conduit where interoperability development and the like, kind of riding on the back of any state system we were to build that the locals would be able to communicate on, we see this as being the backbone for any kind of a 700 statewide network developed.

We came up with a concept, and it is strictly a mobile concept. It certainly doesn't address, doesn't have the signal strength to address some more developed issues, but for the border areas we thought it appropriate.

We came up with a 10-mile radius and a minimum 20 dBu signal strength, which isn't much, but we felt that, without having to build a tower every eight miles, we didn't think that was realistic with regard to channel separation.

The diameter of the cell that we are going to create you will see in a moment is 20 miles, and the safe harbor ELP limits were figured in when we did some studies as to exactly how big

the cell should be.

We created a pattern of interlocking clusters, nine hexagon cells, A through I. Each cell contains eight total 5 KHz channel pairs, three of which are common to all the cells. The frequencies each have 250 KHz separation, as Bob had stated, and each channel set is represented within all the channel pairs in the cells. There's the three common 25 KHz channels for either state-to-state interoperability or some commonality within the system.

There's the channel set. We used 45 of the channels in a nine hexagon cell, and the three channels left over we made common to all cells for some type of consistency through the network. That can carry over across state borders, you'll see here in a moment.

There's the cells. There's about 230 of them. It's not too bad to read, I guess.

As you can see, as the pattern begins to develop, it is a shame if you have to stop at the state border. So we thought to create kind of a

collar or an insulation area -- we originally looked at 30 miles, and Bob came up with 25. Either will work.

The key in what we see here is that, if the pattern is continued, what it does is it begins the development of a dialogue, which we think is important for the states to talk to each other and to acknowledge the fact that on the Missouri, Kansas, Oklahoma border, on which there aren't a whole lot of people, at least there will be some negotiation and discussion with regard to the use of the channels, which is in that case not half the battle, but almost all the battle, because there's going to be plenty of channels to go around.

The thing is the Kansas City issues are probably going to require some more intense packing such as Bob was discussing, but, once again, Missouri and Kansas and Missouri and Illinois are discussing the issue, which is the battle. If we can get people talking, we think that we can work around our licenses that have already been issued.

This is just another shape of the way

the channels go. I think there's 240 of them total, if you look at them.

Now I might add, these hexagonal cells are exactly that. They don't do much for you. If you overlaid the county boundaries, you would see that some fall in and are actually right on the county line, some are right on the state lines. We would literally just divide the channels up as they fell.

Keep in mind that within a 30- or 25-mile, whatever distance is decided, what we do in the middle of Missouri really has no bearing on anybody other than Missouri. So that is just working out the coordination within ourselves.

So if you can imagine, as Bob had, a border shaded area all the way around, that would require some coordination and everything else on the inside. You don't want to make that too big. If you take the 115 counties in Missouri and have a 70-mile border, you only have about six counties left that aren't affected by that. So it is important to keep that border limited, but not necessarily too

much encumbering the State's geographic license or that removes the point of issuing it in the first place.

Co-channel separation, 60 miles if you are assuming that there is a tower in the center of each cell. Adjacent channel is a 30-mile separation if you're making that same assumption. Co-channel and adjacent channel.

The common pattern, the three common channels we indicated earlier, exactly what the need would be for that, we think that would be beneficial with our adjacent states. We think that would be something that we could carry that pattern over and they could enjoy as well.

The 25 KHz blocks, we use the 45 25 KHz channels to allow technology to be implemented in whichever mechanism the adjacent states felt needed. We thought the technology neutral.

If the site is in the center of the cell, the tower distance adjacent is 20 miles. Every 60 miles of the region -- like I said, it is not maximum spectral use. The only criteria used on

this is distance. It is not terrain. It is not population. It only uses distance to lay out those border areas and to provide some insulation for the borders for the states that might not develop a 700 immediately.

No adjacent cells will contain adjacent channels. Really, if you just develop a grid, a distance-based grid that can be used effectively, it was really our goal, like I said, to try to provide some insulation within the border areas that we see.

These are some of the benchmarks that the states are given: January 1, 2007, it starts January 1, 2007, based on the DTV transition, I would imagine. The states need to be prepared to provide substantial service to one-third of the population January 1, 2012 and two-thirds by January 1, 2017.

Any questions?

(No response.)

As a test pilot, we have extracted the counties in Missouri -- let me see if I can go back -- and gone through and looked at where the cells

lie and associated those with counties and placed the State license frequencies on the NPSTC database. It is on there now. It lives there, and, quite frankly, that's the only place one can go look and find those channels right now in Missouri.

They are out there, and we thought it was something that we could use in other states eventually. Once they have access to the database, they also could look and see which channels, which state-licensed channels exclusively we're talking here, are used within the Missouri border counties that concern them.

MR. SHAHNAMI: This is Ali.

On the pre-coordination database, would we see the county borderlines for allocations?

MR. DEVINE: Do you mean the geographic picture of the county borders?

MR. SHAHNAMI: Yes.

MR. DEVINE: Yes.

MR. SHAHNAMI: Thank you.

MR. DEVINE: They are listed in a -- you can inquire on the county itself and the channel

names.

MR. SHAHNAMI: Thank you.

MR. DEVINE: Any other questions?

(No response.)

Thank you.

MR. NASH: It's a pretty interesting pattern for Missouri.

MR. DEVINE: Right.

MR. NASH: Are you proposing that that would extend all the way across the country?

MR. DEVINE: Well, let me just put it this way: Given the criteria that it uses, strictly distance now, and the fact that much of it was done with pencil art, no. But I would like to see the concept be something that, if Montana was to be delayed in their implementation, the border states around there wouldn't feel that they were -- you know, we have had some border wars in Missouri, obviously, geographically with the 800 process and those things.

I like the insulation properties that the state license can provide. I would imagine

somebody could write an algorithm to generate this distance parameter and to develop this honeycomb-type thing. I am not initially proposing that, but I would like to see it. I don't want to be to have to do it.

MR. NASH: The reason I ask is let's now step into your adjacent State, you know, Kansas over there, and say they decide that a honeycomb is nice, but they decide that a little different size of honeycomb --

MR. DEVINE: Right.

MR. NASH: -- or they decide that an eleven pattern is better than a nine pattern --

MR. DEVINE: Right, right.

MR. NASH: -- or they decide, they make any decision that isn't similar to yours, we now have an interface point between the two patterns.

MR. DEVINE: Right.

MR. NASH: Certainly to the extent that your pattern extends into Kansas, their pattern would extend into you. So there's not only an interface point, but there's an overlap section of

incompatibility.

MR. DEVINE: Right. You can't start this in the center. We started in the geographic center of the State, the best we could tell. You can't do this in every state because, as Sean pointed out earlier, the efficiency derived from doing a nation compared to doing 48 contiguous states is tremendous, the difference that is achieved there.

This has to be consistent with one starting point, and the ending point being the Atlantic and the Pacific to be effective.

MR. NASH: That's kind of my point.

MR. DEVINE: Right, and I'm certainly open to that. The parameters are pretty much established. Like I said, it doesn't use the packing criteria that Bob had discussed and some of those other things, but, you know, on the Missouri-Iowa border I can tell you there's not many people there. Now David Funk's got family there. I'm not going to get too close with it.

(Laughter.)

There's not many people there. Quite frankly, what we develop there is going to be sufficient, and it's going to provide Iowa the time to implement, a year-and-a-half, two years, three years, four years down the road. They're not going to have to say, "Boy, now we've got to reinvent this Missouri-Iowa border issue."

So I like the insulation properties, and if it can be beneficial, I'm all for it.

MR. NASH: Yes, but I think there is at least one city that extends on both sides of your border that you would have to deal with.

MR. DEVINE: Yes.

MR. NASH: A little place called "Kansas City."

MR. DEVINE: Yes. Yes, there are some issues.

MR. NASH: In California it is the same border thing, that most of our borders with other states are pretty lightly-populated desert areas, to where we could probably give every resident his own channel and not run out.

(Laughter.)

Now we certainly couldn't give every jackrabbit a channel.

MR. DEVINE: And it's interesting because the same practice in many areas of the state will have different effects. In Kansas City in Missouri or Kansas City and east St. Louis or the east side of St. Louis, what this will do is this will promote dialogue. They can use any type of contour -- it could be Bob's contour-based -- any type of mechanism to develop their channels, as long as it is probably beneficial for the state license channels to be on the database. Quite frankly, nobody will know anything unless they actually have some place to see it.

But the same application could be used differently on the Missouri-Iowa border than it will in St. Louis or Kansas City. So as long as those people begin a discussion, begin a dialogue, I think we have won the war.

Any other questions?

MR. SCHLIEMAN: I think I might comment

that states could use a combination of the two plans that we presented here.

MR. DEVINE: Absolutely.

MR. SCHLIEMAN: The important thing is that there are a couple of ways of doing it, and it is what the parties agree to.

MR. DEVINE: Thank you very much.

CHAIRPERSON DEMSEY: Thank you, Steve.

The Implementation Subcommittee is finished.

MR. WILHELM: And we're adjourned. Thank you all very much.

(Whereupon, the proceedings of the Implementation Subcommittee were concluded at 3:23 p.m.)

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