

ROUGH EDITED COPY

RIT/NTID

An International Symposium  
Technology and Deaf Education

"Wireless Emergency Communications:  
Accessible Alerts for People with Disabilities"

Presenter: Helena Mitchell

Session M11E  
June 23, 2008

CAPTIONING PROVIDED BY:  
ALTERNATIVE COMMUNICATION SERVICES, LLC  
P.O. BOX 278  
LOMBARD, IL 60148

\* \* \* \* \*

This is being provided in a rough-draft format.  
Communication Access Realtime Translation (CART) is provided  
in order to facilitate communication accessibility and may  
not be a totally verbatim record of the proceedings.

\* \* \* \* \*

>>HELENA MITCHELL: Good morning. My name is Helena Mitchell. I'm from Atlanta, Georgia. It's nice and warm there, about a hundred degrees in temperature, so it's nice to come where it's a little cooler.

This morning I'm going to talk about wireless emergency communications, and I'm sure everybody knows what that means, but for our perspective, we use old technology cell phones and the newer technologies, which is already outdated, but we'll be talking about how these can be used in emergency situations.

If the first question is why even talk about the area of wireless communications? Well, one thing we found is that obviously having mobile technology increases a sense of independence, and the quality of life for people with visual and hearing impairments and also mobility impairments to move about and not have to be so confined.

Also, we found that having applications of mobile devices permits also attractiveness to the general population. For example, the initial use of PDA's by the hearing population was quickly adaptive by those who couldn't hear, and Gallaudet students, when I go on their campus, they walk around -- oh, I forgot to turn it on. Sorry. Sorry. There we go. Is that better? Sorry about that.

Also, we found that the lower cost of new models is making it much more affordable for people to be involved in being able to use these technologies. The reason that we got into it is my background is with the federal government in the United States, and I've worked for the Telecommunications Administration and also for the Federal Communications Commission. Federal Communications Commission, for those of you that are not aware of this, handles all technology developments in the United States, and the rules and regulations that determines how these are rolled out.

In 2005, which was a landmark year, they amended the rules to make sure that in the event of emergencies and public warnings, people with disabilities were included in this process. Which, up until that point, had not happened. We have done a number of filings to push the emergency alert system notification program. In the United States, if there's a natural or a man made emergency, the first signal that's sent out is through the federal government, through the Emergency Alert System.

The next thing we did was take a look at what is the wireless use among people with disabilities and how many of these folks had access to these technologies.

We have something called the user survey network, and we have over 12,000 people with hearing or visual impairments, and since 2001, we've been surveying them on the types of technologies they use and the technologies helpful.

As you can see, looking from purple, which is 2001, to most

recent, which is 2007, we've actually had an increase to show that technology has raised from 72% to 85%. Our user group is very diverse. They're from 18-year-olds to 87-year-olds. So for us, we were very shocked that the number would be so high, actually. But I think most of you -- how many people in this room have a mobile device on them? Everybody, right? Just about everybody? So we know that we as users are using them so we always have to assume that the rest of the population is, too, particularly with the prices coming down. Everyday use also increased. So people not only just used it now for emergencies or for calling their family and friends, but we find that they're using it for everyday life as well. And the importance of it, which is even more important, has increased. So in our survey, we found 84% use some type of wireless product, a mobile phone or personal device assistant, or some other type of use. But what do they use it for? Well, the main reason that they use it for is for voice, obviously, and the next for 43% is text, and that's usually our hearing impaired population uses it a lot for texting. E-mails was 41%, internet is 35%. E-911, which was just passed in the federal government, is another large use of it, and it's being used. E-911 stands for enhanced emergency communications. So this is kind of a tight file, but you can see our objectives. What are we trying to accomplish in this project and the main thing is that we want to make sure that any kind of information is specific and accessible to everybody, and that we do it by the most optimal means because so many people have problems trying to figure out how to use some of the technologies that we're trying to make it easy so it doesn't become complicated. You don't have to go through a long menu to get to the information you really want. So we started out by taking a look at the technology approaches that are currently out there, and we have a team that has engineers on it, that has emergency managers on it, that has folks that are involved at the university level and consumers. So this is how we are able to determine what are some of the best ways to do it. And the emergency communications community obviously never really thinks about people with disabilities when they are constructing and rolling out technology, not because they don't want to, but just in cases of emergency it doesn't just normally roll off their tongues. I'll give you an example. My husband works for the FEMA, which, if you're an American, you know a lot about from all the problems we had with Hurricane Katrina. Well, luckily,

because he's married to me, he's very sensitive to these

issues, so he's at the FEMA headquarters in Louisiana, when it's going on in New Orleans, and he sees a big sign that says blind people report to Section A. And it wasn't -- people weren't thinking. They're like, oh, yeah, that's right. If they're blind, how can they see the sign? So it's the same kind of situation, trying to make sure the right information gets to the right people for them to take the correct action.

One thing we started doing was we had certain partners in the industry. We have Nokia, we have AT&T, and we have the Blackberry Company, and so they gave us different technologies and hardware so that we can start looking at accessible formats, how do we put this information to a format that makes it easy for you to use, and then we started working with our field tests and rolling these out, and I'm going to go into the field test a little bit because I think that's really important to see how we gather the information, and how --

And the most important thing for us is taking all this information that we generate and filing it for the FCC because one of the things that the FCC asks us to do and not just asks us, but asks the entire country and people who work in the field, is to tell us what makes accessible alerts for people with disabilities, and since we don't take sides with anybody, we think we're in a good position to help them out.

So what's our methodology? We were going to do four field tests to take a look at how effective and accessible these alerts are.

At each field test we give a pre-test and a post-test questionnaire to users, and then we wrap up with bringing each group back into the room and we do a focus group to discuss their experience during the test, and then we tabulate, qualitate and quantitate information. The final field test that we're going to do is take a look at the FCC rules that have changed in the year since we started doing the testing, and there has been some. One of the major ones that's going to be a problem for the deaf community is that before, you could have 120 characters of information that goes out on the nature of the emergency. That is now being cut down to 90 so we've got to figure out what's the 90 most important words to put into these characters that forms the sentences. Do you have a question?

>> Why?

>>HELENA MITCHELL: Because what happened was the mobile operators that make these phones say that too many characters takes up too much space on their servers, and it makes it too difficult for them to disseminate the information. So they said if you want us to do it, we'll do it, but it's going to be at a cost to us so therefore, we're

going to cut it back for the consumer.

But that -- it's a big argument. That's a good question because there's a lot of argument in the industry and among the community as to what we should be looking at and why. You're absolutely right.

So the first test that we start out is how do you currently review emergency alerts? And as you can tell, most focus review alerts through their televisions because if you're in the United States, I'm sure at one point you've all screen that scroll at the bottom of the screen that says this is an emergency, and a lot of those are locally generated, which is good because in reality, the Emergency Alert System has never been activated. Who knows why? Anybody know why? >> I'm going to guess and say because it's tied to nuclear accidents or nuclear aggression.

>>HELENA MITCHELL: Very close. Because what happened, the system was created because of the fact a bomb might be dropped, and so therefore the only one in the country who was able to activate the system was the president of the United States, and that's the way the system has always been -- has always gone. But then what started happening is if you live in tornado alley or if you live in an area that may have floods or, like we see now, or if you live on the coastal area that has a lot of hurricanes, obviously you want to know the information, too.

So we've started to allow states and local emergency communications groups to start using the activation system. The next one that comes in is telephone. People find out a lot from family and friends who say something's happening in the neighborhood, take cover.

And then surprisingly, for the first time, mobile phones has outdistanced the other areas because before, people had information, mostly from sirens, which is this one here. But now your mobile phones has gone up.

And of course then a lot of people have sirens or they have personal learning devices of their own that they carry with them. So this just interesting for us to see.

But what happened is that still traditionally the media outlets is how people mostly get it, or low-tech systems.

First off, we bring together small groups. We had about 10 to 12 people in each group, and then we assigned them to what we call an observer. When we give you these devices to do the testing, we don't want you looking at the device. We want you to do what you would normally do with a cell phone. So how many of you now have your cell phone in your pocketbook?

Okay. And is the pocketbook is off, probably right? How many are on vibrate or something? Right.

Okay. The guys, where's your cell phone? In your back pocket or your breast pocket? Or on your hip.

Okay. So we didn't want you to change the way you do things. We want you to continue to carry these devices the way you would because obviously you're going to respond faster if you know you have a test device.

So the idea is to distract you. So we had them at television stations, we've had them at schools, we're supposed to do a test here at NTID, so we're going to see how that works.

But the first group, what we had, is those who were blind and visually impaired users. So the first group is technology savvy. For us, technology savvy means you know how to use at least three kinds of elements on your phone. So not only do you take your calls, you can make calls, you can text message, and you might use it for a third service. So you're familiar with your phone and all the different types. If you have a Blackberry, you're familiar with all the devices on that.

The second set we call mixed ability, and these are people who may not use it quite as much, but they might use it at least six or seven times a day.

And then the last group is what we call the infrequent users. Interestingly, in the blind community, most of the infrequent users were the elderly, which I guess is not unexpected, because my mother still sits in one location when she takes a phone because she thinks she can't -- well, she knows she can move, but, you know -- and I see younger people doing that, too. They still say in the same location. They don't realize they can move around. And she never makes a call, she only receives calls.

So what we did is we supplied these mobile phones -- well, we built special custom software on it so that there's an audio interface that gave text-to-speech meanings of these emergencies.

So the good thing for that was that we were able to

synthesize a voice. The bad thing about it is that nobody liked the voice that we did. They all complained. They said it didn't sound natural, it was slow. Some people said it was fast, so we're working on that.

And then we sent out a series of three messages, and each message increasingly gets louder.

And that's because the first time we send it, we want you to know something's going on, but it may not be imminent and it may be something that could possibly happen.

By the second one, this emergency's getting closer to you.

So we want you to definitely get your attention. And by the third time, you better take cover or you better get outside, depending on the circumstance.

But, the unusual thing about our testing, because how many of you now review some kind of emergency message in your schools or from your communities?

The difference between what we do and what most of those do is that it's in the EAS tone, so you can immediately tell that it's not your traditional phone ring, it's a different kind of message coming in.

And the other thing is ours comes down directly from the satellites. We get directly from the National Weather Service, which bypasses all these other systems. Because for those of you that get it, how many of you also get advertising?

Oh, well, that's good. Okay. Because a lot of people complain they get advertising on their emergency message.

Yes?

>> You said that a special tone. Do you have a special vibrate?

>>HELENA MITCHELL: Yes. That's on the second test. The second test was geared toward hearing impairments and some visual. But most of the people in the second group was -- it was about three-quarters hearing and then one-third still had visual because we wanted to be able to carry over.

Yes. So the second one included the vibrating cadence attention signal to differentiate between a regular text message coming in and the messages from the EAS.

And this is not an SOS vibrating. So it didn't go constantly, DA, DA, DA, DA. It broke up the way it sounded.

So what did we find out from the first test? Well, it was interesting because we found out 94% found it was an improvement. For the 6% that didn't find it was an improvement, it was because they were already receiving messages from a more high-level sophisticated voice, which

makes a difference because if you know that there's an emergency coming, you want to be able to respond quickly. So but most of them said it was a very convenient way to review the alerts. They thought they could react to it quicker because of the way the system came in and then they're not always around TV, friends and family, so they needed that.

And they thought it was hard to get information when you are blind and outside. That was a major concern for the more elderly, and people with more than one disability, who were often in the blind community.

What did they think we could improve on? Well, they thought we could have more cues on how to play the message. Because it wasn't as simple as they wanted it to be. And then, of course, the ability to speed up or slow down the voice, the message, and then again, more sophisticated. If you know how to use it all the time, want the message fast. If you have hearing problems as well as visual problems you might want it to go slower.

And one thing that we found that was really important to us is we were able to adjust the volume or the pitch. Because

what you could do is you could push the up button for the volume, but by that time you might have missed the message so you had to go back and replay it so that became important.

And then they wanted a continual loop message until the phone was answered. And that was a really good suggestion because a lot of times, even for those of you that have these messages because we get them from our university also, it doesn't replay, it kind of sits there. So one of the important things was that you be able to answer it after. It would never stop until you answered it. That's really important.

So the second field test, now the number drops. This is with the population now that was primarily deaf and hard of hearing. Anyone know why it might drop? Anyone want to take a guess?

Well, you're at a school that deals with a lot of deaf. Why do you think it might drop?

>> I think there's some specific challenges to reaching deaf people. That's what we're finding.

>>HELENA MITCHELL: Okay. Well, one of the reasons why it dropped is because actually the deaf population is much more savvy in using the phones, so there were a lot of other ways that they were experimenting and trying to review these



messages.

And they were much more in contact with each other. If you notice on campuses when you walk around, I mean, these students are constantly -- and the signing is much easier to follow, so they're constantly communicating together. So for them, they had other ways that they thought could be just as effective. So the number dropped.

What did they like best? They liked the override feature that interrupted the current phone activity. So that's something that came out in the first test, and that was important because a lot of -- because since this is also a more technology savvy group, and they went off to do what they were going to do with the phones, they would be on the phone, they'd be text messaging each other, so we interrupted them, and they were like, oh, wow, okay. So my conversations interrupted. But it wasn't stopped. It went 0 into a hold pattern. Yes?

In the format, they say we're reaching more people, and they were not -- and particularly if they lived at home they thought it would be very helpful to them.

So other information that came out that we thought was very important, we knew we were going to repeat the message, but we couldn't do it in the second test, we had to wait. For those of you that have been involved in testing, you know you can't change the testing in the middle of the stream. But one thing that was really important is the signals for

service animals because a lot of the population has service animals, and so they really wanted to know, if I can't wake up, if I'm really sleeping hard, how do I find out. So we were talking about different ways of doing that. And then multiple zip codes, because a lot of times we're all here at this conference, but is not our home zip code, so what if something is happening right here, we're in this room, we're not going to know what's going on.

So one thing that we're going to be doing is able to give them more than one zip code. And the research team, we're doing that on our own phones. See we're all part of the test, too, so we've been adding more than one zip code. Because it's funny, because I was at the Sea Sun, which is a big conference in California that they have every year for people with disabilities. My phone went off, and it said a tornado, and we didn't even -- we forgot that it was still back in Georgia that the tornado was coming.

So the proposed technical approach -- as you can see, I'm not going to go into this slide, had a lot of options. We

decided we must be able to bypass this to make it a lot cheaper to create.

So we created a different system. We take the information directly down from the National Weather Service, which is where the Emergency Alert System gets their information anyhow. We bypassed this box, which was a decoder, and we sent it directly to the software using soft, short message services, to our modem and sends it to the network and sends it to the device, so it takes less than eight seconds. And actually we tried it one time and we were able to get it done in five seconds.

So what are some of the solutions going forward? One of the things we really wanted to do was to take a look at some of the FCC findings regarding how to test, and we wanted to make sure we could support the equal access. That's really important to critical information because right now there's still a lot of work that hasn't been done, and the government's trying to figure out how to provide it.

So we're very concerned about the whole idea of accessible emergency alerts.

And also, with all the work in digital, because this country is going from analog to digital, and all of you now, I know in Georgia, on our TV screens almost every day it says February 2009, analog is going away and you're going to have digital, so we have to get ready for that and we have to make sure that those digital-based systems are able to get information.

EAS improvements that incorporate the existing FCC disability access rules was found to be really important also.

Right now in the United States, there's some major rule

making that goes on. It goes back to the 92nd issue that I had just addressed.

They just put out a new report and order. A report and order means this is a new way we have to do business. So for everybody who has a mobile phone, your mobile provider is going to start saying -- they're going to be doing these issues or they're not going to be doing. We're saying they must create a common audio attention signal, and for us, we're saying, the most -- the best one to use is what you're already familiar with, which is EAS. So when your TV sets are interrupted, now you're used to the signal. Don't go creating something new that adds another layer of confusion because in an emergency, we don't always have -- trying to respond. We don't have time to take the whole piece apart.

The other thing we're saying is that we should keep the 8-second tone. EAS signals, when they come over your TV sets or your radios or whatever device, you have what they call a NOAA, national weather radio, they're all 8 seconds long and I sent out a signal right now, I bet it would take each of you at least five seconds to reach your device so that's why we're saying keep the signal a nice, long one. And then we get back to a common vibration cadence that you had mentioned, and we're also saying what we like to do is start having the manufacturers label the devices. Because right now, we've also put out a little guide for if you have a disability, which is how to choose your cell phone, but wouldn't it just be easier, because the manufacturer has all these labels on the phone boxes and everything inside anyhow, it would just be easier to say this mobile device is capable and adaptive for people with disabilities without audio or visual impairments.

The 90-character text limit, we have to play with that. A lot of people in the industry are trying to figure out how are we going to get these messages condensed to 90 characters because that's not a very long signal. And other part of that is that they're not going to allow us to use URL's. One of the things that we were doing in our tool box was we would send out the initial message that says, warning, a tornado is coming to northwest Fulton County. And then we would say, if you're blind, go to hit button 1. If you're visually impaired, hit button 2. If you're deaf, hit button 3. Well, now we're not going to be allowed to do that so we've really got to figure out how do we get the information for people to follow up on what's going on. And then that's dealing with adding trailers to the alerts. So if you can't have a URL, we want to at least be allowed to have trailers on devices that are being used by visual or hearing impaired.

So on our group, we have research students, we have engineers. So Frank Lucia, and for anyone who works in the

emergency communications community, we used to work with me when we did the emergency alert system and the emergency broadcast system. Then we have engineers. Our experts are made up of broadcasters, universities, blind and low vision, deaf and hard of hearing populations and emergency public safety personnel and trainers.

And I'm sure all of you can figure out why we have to have emergency trainers, right? Because they're the ones that have to be able to make sure that it happens when the

emergency drops down.

And then we're what we call a rehabilitation engineers and research center. There are 22 in the United States, and each of us are funded at \$5 million for five years. We're in our second \$5 million ten-year phase now.

But these are -- there are some that are technology related along with us, and so there's about three others that are technology. There's one at Gallaudet. Is anybody familiar with the Gallaudet group? But there's one at Gallaudet University and there's one in Wisconsin.

So, if you want to contact me, this presentation is going to be available as part of the technology symposium. And feel free to call me, E-mail me, or go on our Web site and see all the kinds of projects.

We have 12 projects. The emergency communication is one of them. But we also do things with mobility. We do projects that look at the barriers and opportunities for wireless research and what rolls out.

So if anyone has any questions, let's get into a dialogue, a little bit of a discussion. Yes?

>> What could you say about the ATSC's role in your next generation mobile and hand held standards for this area?

>>HELENA MITCHELL: Okay. Why don't you explain what that is to the rest of the group, or do you want me to? Go ahead.

>> The Advanced Technology -- AT -- Standards Committee. I want to get it right. The Advanced Technology Standards Committee, is the one that's helping standardize the next generation of digital TV, and as part of their work, they're working on next generation mobile and hand held devices, and writing new standards for those devices. So those devices have not come to market yet.

But what does your group do in influencing the next generation?

>>HELENA MITCHELL: Well, one of our engineers is on the standards group. But standards is -- many of you may not know, takes literally years to go from beginning of the concept to the actual roll-out, just like the rule making at the FCC. So for one reason, the commercial mobile alerting system is rolling out like that. So we're trying to work with that group because that's coming up first. And we'll

stay on the standards group, but we don't think that standards groups are able to roll it around quick enough. Also, when you -- when you ask a question, why don't you tell us your name and where you're from so we get a good

feel from where everybody's from.

Any and all questions are welcome.

Well, the reason this whole concept came about was because when I was with the FCC, we were very concerned about the fact that people who did not speak English as a first language and people with hearing and visual impairments had no way of getting alerted because in New York and other major cities, there are large populations. For example, there's Spanish stations throughout the United States that when an emergency happened, they didn't talk in the language that they had been doing the whole time, Spanish, they started talking in English.

Well, that's not going to help you in the time of emergency. So after I left the commission, I was still interested in continuing this work, and some of my colleagues were, too. And the beautiful thing about it is we've had a lot of cooperation from government agencies, from the emergency communications community. So we've been really fortunate in that way.

So how many of you are with the universities? We do have a few minutes left. University. Where's everybody from?

We're a small group. We can say.

>> K-12 deaf education in the Rochester area.

>>HELENA MITCHELL: Oh, okay. Good. Both of you. Okay.

Are you from the school of Rochester -- no. Board of Cooperational Services, so the southeast area around the suburbs in the City of Rochester, the southeast. There's another one that's north and west. Fairport.

>>HELENA MITCHELL: One of the things that we're doing with one of our testing is we're doing it with the fire departments and the police departments because one of the things that they were really concerned about is that they know their communities more than anybody knows their communities, and they know that they have either deaf or they have mobility people -- people with mobilities or they have vision and blind people, but they don't know what to do with them in case of an emergency. Because basically they self-identify, so they partnered with us on this project because they want us to hold statewide workshops to talk to the emergency community about what to do in case of evacuations and emergencies.

>> Well, that -- that brings up a question in my mind, with so many schools now, K-12 and university settings using smart boards and other kind of technology, is this going to be tied in in any way in that kind of technology that's placed in schools or are you concentrating first on personal

devices?

>>HELENA MITCHELL: We're concentrating on personal devices. One of the test sites is the Atlanta public school system because they have a public safety community and a director of public safety and all that. But what they don't have is ways of contacting -- the regular classroom teacher who might have a student who's either blind or hearing impaired. So what we need to do is we're going to let them and their students -- because a lot of students, even though they can't have their devices on in the classrooms, they still have devices on them, so we want to be able to turn devices on when they're in the off position, which is not that hard to do.

But yeah, we worked with the Atlanta Public Schools, because that was a concern we had.

>> It would be nice if it could just crawl out along the bottom of a smart board, you know, tornado, flood, lockdown.

>>HELENA MITCHELL: That's true. But I think that each technology is so specific to how it's integrated, and the cell phone manufacturers are already uptight that they have to do this and they're not going to get any money for it.

>> I'm Stacy with the Arkansas School for the Deaf. We have message boards in each one of our classroom and we're currently investigating a way that these -- a message on a cell device or something can immediately launch those messages, and we also have smart boards in all of our classrooms, and our message net system will launch an override message on whatever computer that you're on, so if your projector were on, it would start scrolling. But we're not quite to where our phone can launch that.

>>HELENA MITCHELL: We're doing that also. That it goes on your computers if you're on a laptop on line, and we have another project where if you wear a pendant, we're putting out pendants that you can sign to and it signs back. So that's one of our other projects, and it's really neat. And then we have another project where there's a little device that attaches to your eye glasses, and actually it's being used by regular vision-able people in theaters when they go to see plays in different languages because what it does, if you're used to closed captioning, it's always in the same spot, so if there's any action on the screen, you kind of miss most of it because you're busy looking at the subtext. Well, this obviously floats wherever your eyes are. So we're working on some really interesting projects except the funder for our project from the Department of Education said one of our projects was a cushion so that if you have mobility problems it tells you where the -- where not to move so you don't get sores that a lot of people end up getting who sit too long in wheelchairs. He told us, he said, you know something? I love this fancy stuff, but can

you just give me a green, yellow and red signal? I don't really need this. I just want to know if I should be on it or not on it.

So we keep trying to pull back our engineers to some extent to say they have to be more in tune with what people's needs are.

Well, if there's no other questions -- we still have another five minutes. Okay. Where are you with, sir? Who are you with?

>> From Hawaii. We have our problems with hurricanes over there. We had some training before with CSPAN, and they have an internet Web site. They came and they trained many of the deaf community people with firemen, police. We're trying to move that along. And sending out messages with wireless phone service, one of the things that they tried to move forward to.

>>HELENA MITCHELL: We have one of our project directors is from Hawaii. And did emergency work there. Where are you from?

>> New Jersey.

>>HELENA MITCHELL: Oh, which school?

>> Alburton Community College.

>>HELENA MITCHELL: Okay. Well, I don't want to keep you guys from lunch, there's a few more minutes, but if nobody has any questions --

>> Thank you, Helena, that was very interesting. We are very interested in your comments. I have hard copy evaluation forms. We encourage you to get -- to provide us with an evaluation, either hard copy or online. The learning center is open for your online evaluations. The most important thing you can give us is the session number, which are named after the days and the time. This is Monday at 11:00, so therefore this is session M11.

If you would like to complete this hard copy, please take one from me and give it back to me. If you prefer online, you can do that in the learning center.

>>HELENA MITCHELL: Where is the learning center?

>> The learning center is on the second floor of this building in the center of the building.

Thank you again, Helena.