

**City of Seattle Community Technology Advisory Board**

**November 12, 2019 Meeting Minutes**

Topics covered included: Opportunities for a Community-Owned Cellular Network; ReSTART internet addiction treatment support, committee updates.

**This meeting was held:** November 12, 2019; 6:00-7:30 p.m., Seattle Municipal Tower, 700 Fifth Avenue, Room 2750

**Attending:**

**Board Members:** Steven Maheshwary, Torgie Madison, Charlotte Lunday, Rene Peters, John Krull, Katie Cummins

**Public:** Harte Daniels, Rebecca Rocha, Dr. Kurtis Heimel (UW), Kyra Arzeh, Kreg Hasagawa (Seattle Public Library), Hilarie Cash, Camille Malonzo

**Staff:** Tracye Cantrell, David Keyes, Alice Lawson, Tracy Brown, Cass Magnuski

**18 In Attendance**

**Steven Maheshwary:**Let's get started. Welcome to our second to last meeting of the year for CTAB. We're going to call the meeting to order and also do a few introductions around the room. We have a smaller crowd tonight. Before we do introductions, I want to start out with a smaller introduction, because we have a new member on our board, our newest Get Engaged member, Katie Cummins. Katie, do you want to share a little bit with the board about your background and why you were interested in coming to CTAB?

**Katie Cummins:**   And I can talk a little bit about the Get Engaged program. Oh, I guess everyone is pretty familiar. My name is Katie. I actually work at the YMCA, as well. That's how I heard about the Get Engaged program. I have a pretty varied background. I'm currently working in a nonprofit. I have also worked in local government in Boston, and in retail at Amazon in kind of a mix in digital marketing and digital service delivery. I've always been passionate about civic engagement. I missed that when I left local government, so I'm happy to be involved in it again. In particular on why I wanted to join CTAB, I think digital equity and access is really critical. It's a foundational resource in everything that the City does, and in how people advance, and just even find information. So I think it's really critical.

**Steven Maheshwary:**   Awesome. So, we're really excited to have you on the board. So, in terms of introductions, let's go around this way. Say your name, what you do, and your neighborhood.

**INTRODUCTIONS**

**Steven Maheshwary:**   We will segue into some minor housekeeping here. Moving on to our November agenda and October minutes, do we have a motion from any of the members to approve our November agenda and October minutes?

**Rene Peters:**  I move to accept the November agenda and October minutes for approval.

**Steven Maheshwary:**   Do we have a second? I'll second it. All in favor of passing the November agenda and October minutes, please say, "Aye." Any nays? Okay, the motion passes. Thank you, everyone.

**John Krull:**  I abstained.

**Steven Maheshwary:**   We have one abstention. That should still be enough to pass.

**John Krull:**  It's just because I wasn't here for that meeting.

**Steven Maheshwary:**   So, without further ado, I would like to introduce our first speaker, Dr. Kurtis Heimerl, to speak to us about opportunities for a community-owned cellular network. We're a small group, so he is open to interactive Q&A during his presentation.

**OPPORTUNITIES FOR A COMMUNITY OWNED CELLULAR NETWORK**

**Dr. Kurtis Heimerl:**   Thanks for inviting me. I'll just talk  a little about a relationship we have going on at UW. I'm part of the ICT lab. The research is focused [unintelligible].... Richard Anderson has been running this group for a very long time, covering open data which is open source data collection that's used. He works for the PATH here in Seattle as well as [unintelligible].... I joined more recently than Richard. This is the start of year four for me here at the university. I was an undergrad, actually, in 2007, and just came back.

I am primarily focused on the problems of internet access. I promote internet access throughout the world. There is some consternation about what I'm involved in. Specifically what we work on are community networks. These are networks owned and operated by citizens in an open manner. We've got about 35,000 nodes in Catalonia. This is huge. There are a couple more, in Argentina. There are a couple hundred nodes in New York City of WiFi that they're running to provide connectivity to communities out there. I want to make it super clear that this is distinct from municipal networks. It's more like  cooperative and less like a municipal network, although, obviously, it's owned and operated by the people who make use of the network.

Traditionally, these are built using WiFi. If people have heard of mesh networks, you have probably also heard of people growing mesh networks then kind of disappearing. Largely, our feeling is that mesh networks don't work. It's really hard to scale them up if they're trying to be dynamic, or else it gets really complicated. The reason we use 211 is because it operates in an unlicensed spectrum meaning it's really cheap. So hacker people come together, build out a network, scale to nodes, and that has been community networks for the last little while.

My group has been working on an extension of this model to cellular protocols. These are what we call community cellular networks. I've been doing this for  while. These are built off of a set of open source protocols. I used to be a committer of BTS. We're now working on a couple of the LTE stacks. There are a couple of examples and we are one of the leading groups in that area. Oaxaca, Mexico has 20 different community cellular networks throughout the region. We work with Indonesia and the Philippines where we're running about a 10-node cellular. Our specific focus in the recent past has been toward LTE, so we have a technology stack. You can Google it. It's a community LTE solution that we've appointed in Indonesia and Oaxaca. We're scaling those up i other places.

A key part of our work to date has been focused on rural installation. Rural connectivity is a really hard problem. How do you convince a telecom to roll out service in a rural area? You can't. The economics just don't work. So instead what you do is you build your own network. So, we've been building tools for that for quite a long while. One of my students, Esther, who was the one who put together this talk, but then she is going to the indigenous connectivity summit in Hawaii instead.

What if we wanted to use community cellular ideas in an urban environment? We thought about it a little bit. We thought about the existing connectivity solutions inside a city. A classical image of city-scale WiFi could be considered municipal WiFi. This actually is a commercial company, Fon, out in the UK. It's the largest WiFi network probably on earth. It's more akin to what you would expect to see out of your Xfinity WiFi. What it is is you join this network. You get a router, you put it in your house, and as a member, you get to walk to someone else's house and get connectivity. And if people walk to your house, they get connectivity. So this is Fon. It's like a couple hundred thousand nodes. But it actually died. It has gone to airports, because that's where the real money is. But even at its peak--I've got a coverage map of Fon in the UK, and you can see tht this is like a lot of nodes. You can also see that that's not very big coverage. You can imagine wandering around and trying to use this as your primary network.

So why is this hard? Well, it turns out there's largely a technical issue. WiFi is bad at city scale. WiFi is designed to be small area because it uses a shared medium as the communication frequency. So you don't want to have too many nodes in an area otherwise you're going to have problems. Similarly, it's bad at mobility, mobility being the ability to hand off between access points. It's just not designed for that. It's designed for this office situation where you're just hanging out in a room. It's just fundamentally bad at coordination. You get a really dense network and you can't get good connectivity.  You get a really wide network, you can't move over between nodes without losing the connectivity between them. So, WiFi is really poorly suited technology for providing connectivity at this wider area.

Now we'll contrast this with a telecom in the UK, this being British Telecom. Here is their coverage map of the exact same area. The green areas are the areas with good connectivity. That's everywhere. Because that's what they're built for. This is what your cellphone network does. It's a big, wider solution, and you can just move around. Your call doesn't drop, and it has all these wonderful properties. That's because it was built with a purpose. It's good at wide area coverage. It's good at mobility. The original spec was actually built in France and they tuned it so that you could not lose your call on a train. The speed of trains in France is the actual specification. This extended your data flow to be handed off between access points. It's really neat the way they did it and required a lot of engineering. It's fundamentally just better than spectral coordination. Cellular is a frequency, a choker frequency [unintelligible].... Each individual cell is all about using spectrum coordination. The telecoms paid a bunch of money for that spectrum and they want to be very efficient. It's very different from WiFi.

Let's talk about building WiFi networks. We've been building these WiFi networks for a long time now. When I was a grad student, I was in San Jose. People have been building them out over and over since then, but largely, again, [unintelligible] has been the most successful. Issue number one, the reason that people will immediately vomit on this idea is that spectrum is really hard. T-Mobile just paid $8 million for their 600 megahertz signal that you're probably hearing about on all of their ads right now. That's the kind of money that you need for spectrum. But it turns out that there have been a bunch of innovations in this space, mostly because the telecoms do not want to pay for those licenses anymore. So, there re two big things. The first one is Citizens Broadband Radio Service (CBRS) bands. This is a multi-tiered licensing that's designed to provide room for small operators to exist and share the spectrum. It's 3.5 MHz. This is actually a huge deal. There's a bunch of gear rolling out that moves CBRS. There a;re also things like LTE license assist access, which is how to run an LTE on the unlicensed WiFi bands. They don't want to do that because they don't want to pay up to the spectrum. So, again, T-Mobile has these installations which are like omni-fiber on the towers. They're just running on your WiFi bands, which, as you can see from the Fon graphic, are usually under-utilized between the houses.

Hardware is really expensive. WiFi is really cheap, and so their equipment is really expensive. This has just changed, basically since LTE entered a competitive marketplace for equipment. So, what we're seeing right now is an access point, the big thing that goes in a tower, is about $2,500. This is half of what it was five years ago, and will continue to go down with projects like open cellular and all of these things going on. It's driving that market to be completely commoditized. As much as Wah Wei gets a lot of traffic for a lot of things, they've been the leader is driving that price point down as part of the trade war as it goes. This is going to continue as we move into NR, which is New Radio. That's 5G because you want smaller and smaller cells from your radio, so your going to need cheaper and cheaper equipment. In general, this is a trend that's trending towards us. Interconnect, the telecoms don't want to work with you. This is true, but LTE is actually entirely an IP based network, so we don't need telecom improvements anymore. Basically, they're just an ISP. If you're running an LTE network, you're just an ISP using these particular protocols. People out in eastern Washington do this all the time. They're called WISPs. They run the ISP and provide connectivity. They just provide over the top services like What's App and Messenger and you're good to go.

Operations. Cellular equipment is really hard to use. It's not something that's designed for household usage. This is one of the most exciting changes going on. There's a thing called Private LTE that the telecoms are again pushing. Private LTE is basically saying, hey what small companies want to do is just run their own networks. It's usually for IOT purposes, like you're i  factory and you want to automate all of these things. You can't depend on T-Mobile's network in that particular situation, so instead what you do is install your own LTE network. Maybe you pay T-Mobile for some frequency, or for help in how to set it up. But there are a bunch of companies that are now coming along and making it easier and easier to install your own equipment.

**Steven Maheshwary:**   Are those the same thing as mobile?

**Dr. Kurtis Heimerl:**   No, MBNOs are a separate thing. It's actually sort of the opposite. An MBNO is like you just have a brand and you use it on your network. This is like you don't have a brand but you run a network.

The other piece of this is carrier aggregation. This is becoming more and more relevant. This is stuff like office building, maybe this office building, installs an LTE network here, and sells access to T-Mobile or whatever, and takes a cut off the top. Here you can run your own LTE network inside the building and aggregate it to go to both T-Mobile and AT&T and Verizon, and make all of the customers happy, as well as inflating your bottom line.  But the problem here is that the equipment and the technology is all driving towards smaller and smaller operators being able to run these kinds of networks.

This is a pretty good time to start this research agenda and explore building these small scale community cellular networks. So, what are we going to do? Our big goal in this project is to build equipment and software with that roll-out, so that anyone can run their own cellular. Basically, you take this box, go get some instructions on internet, put it on your roof, use some of these unlicensed frequencies, use some gear, and you're good to go. And a secondary point of this is to actually have these networks work together to provide connectivity. We call this 'federation, it's kind of an over-used term in networking. But now you have this idea of basically everyone stands up here on the roof and you can roam between these different networks. This is a different way to build out telecommunications.

There's a bunch of engineering going on. I'm a computer scientist and we build things. We're building a new way to basically build out this big shared database in the sky, have them all dynamically joined. So you could just turn it on and set it up. It joins this federated network when you hit the road. We talked about the 5GHz, the WiFi and CBRS to operate it. I'm good at teaching and training when we set this stuff  up because there is licensed spectrum in the CBRS bands. We don't want the FCC to come down on us. And we've set up a new nonprofit ISP, the local connectivity lab, which is doing this engineering and setting up this stuff and doing the heavy lifting.

Our plan is that we're going to deploy this in the winter of 2020. We're actually making pretty good progress. The nonprofit was formed about two weeks ago. We're sourcing out at the moment. What we've done is we've talked to MIT, so we've gotten an okay to put equipment on the top of 2545 in the U-District and Harborview Medical Center downtown. So, we're going to put some cellphone networks out there. Those will be two independent cellphone networks that work together. We want to show that as a tech concept. We can add a third and a fourth as we go. Eventually these high points will actually be relays for the actual network. Because there's probably not a lot of people who come around 2545 and Harborview. A key point of this is anyone will be able to join. Once we have this built out into an infrastructure, we have SIM cards for people who want to join the network, and we also hope to be able to subsidize the equipment.

**Steven Maheshwary:**   This may be a dumb question, but do the different nodes need to be close enough to each other to connect and create that mesh signal?

**Dr. Kurtis Heimerl:**   Yes. You need to be able to have the signal on both of them to do the handover. And so that will hopefully come with time, but as it starts, what we hope to do is have a cool graph like this where we have all of Seattle covered. Maybe the functional piece of that is a little hairier. As it stands, they don't need to talk to each other. We don't need them to be directly connected. Hopefully, they're ll talking over fiber running throughout the City. For instance, both of these are on the UW fiber network. They talk to our NOC, which is going to be down in [unintelligible].

**Rene Peters:**  What are some of the elements that make those jagged incomplete circles, as opposed to perfect circles?

**Dr. Kurtis Heimerl:**   Geography, primarily. This is a hill, so you lose line of sight. This is like a very rough estimation. But that's primarily the kind of stuff that you ask. This is an opportunistic coverage map.

**Rebecca Rochas:**   With the nonprofit that's setting up, are they also going to help in terms of the maintenance of it?

**Dr. Kurtis Heimerl:**   Yes. To be clear, the nonprofit is myself and three graduate students, so a lot of that needs to be figured out, as well. With two nodes, absolutely we will help to maintain it. As we scale up, what we're hoping is that some of this stuff can be distributed to people. Moreover, the maintenance load is just quite low. If we can get these things to be equivalent to WiFi in the amount of work you need to do to set them up, and manage [unintelligible].

**Katie Cummins:**   Who is the audience that you're trying to reach to set up the nodes?

**Dr. Kurtis Heimerl:**   That's the next slide.

**Harte Daniels:**  I'm thinking I'd like to piggyback off of that and thinking of an opportunity.

**Dr. Kurtis Heimerl:**   All right. I'll go to the next slide then.  This is a techie project, right? We're going to start by providing people who want to run their own networks. They're doing it because this is an exciting, interesting technical agenda, which it is. We want to get people who really want to own infrastructure, get away from the telecoms, or just understand the eco-system a little bit more. Our long-term goal really is to get it out to our communities. That's the mandate of the research group and why we do this kind of work. Connectivity is pretty good in Seattle, and our research network is going to have a hard time competing with fiber to your house or something like that. But there are properties in this, like the logo and the element and the fact that it is entirely infrastructure. Prices and things can be set, or it could be free access if necessary. There are opportunities.

**Harte Daniels:**  I think phase one could actually be expanded to other people, because there are motivations and music-based studies ....

**Dr. Kurtis Heimerl:**   Yes, that's exactly why I'm here...

**Harte Daniels:**  We are looking at, again, painting with a broad brush with other start-ups and whatnot. We have a problem where we are going to do it to you as opposed to for you as opposed to with you. That means appropriate outreach, innovation, and communication. But it's achievable because it's been achieved in New York City. With really low-income people and not with really technical people.

**Dr. Kurtis Heimerl:**   This was originally referred to as the Othello Project. We expected it to be a UW project through Othello. Turns out that they don't own the fiber off of that. But we have done some canvassing, trying to find these communities. We're just behind the ball on that. Again, this phase one is largely because we want to make sure the technical agenda is on line. There's a lot to all of the phases of this sort of thing. We should absolutely talk, I would love to hear more about the kind of communities you think could use this, and whether that could affect some of our deployment plans.

**Steven Maheshwary:**   How do you scale this to become an actuality? I know your phase one, phase two, is really how you scale. But what do you need to say, I want to start putting in a node into every low-income development in Seattle?

**Dr. Kurtis Heimerl:**   This is a little bit of our needs. When we set up one of these, we don't want to do is necessarily run all of the back haul ourselves. Being connected to things like fiber and tower access will figure in the scaling. Right now, we're doing this because UW IT has these resources and we have access to these resources. The equipment does cost money. But largely, it's just finding the right environments where this makes sense, and finding the motivated people who want to try this inside their environments. You need to have the community involved in a deep sense.  [unintelligible]  Finding the right community where there is some taste for this kind of stuff, finding the people to engage with, those communities who will co-design and figure out what the appropriate amount of that work, and doing that over and over and building out a mechanism to be able to repeat that pattern. Community networks are not as rubber stampy as the telecom networks. Telecom has a laundry list of equipment that they plop down in every single place. And that's the way they have to run their business because they're running like 100,000 nodes throughout the country. But with this, every community has something to say. It's someone's roof, it's someone's house, whether they have a tree in their back yard, comfort level on climbing said tree, all these sorts of things make it different every single time. You're going to have to build for that and you hve to build systems that support that.

**Steven Maheshwary:**   What does have to go in, say, someone's back yard.

**Dr. Kurtis Heimerl:**   It's not bad. It looks like this. And then there's an antenna. You need power. It's not huge power but.

**Harte Daniels:**  That was one of the [unintelligible].... It worked until Sandy hit, and then the community needed what those four kids had done and the Homeland Security Science and Technology [unintelligible] that they needed to complete. But prior to that, they couldn't convince their neighborhood people to do what you just said and run a low power wire. They just couldn't convince people to do it until there was a disaster.

**Dr. Kurtis Heimerl:**   Yes. There's a bunch of really interesting literature on how infrastructure becomes invisible to people. Things like power is a real big problem. You need about 100 MBPS off of one of these things. And more is better.

**Steven Maheshwary:**   What's the cost, roughly?

**Dr. Kurtis Heimerl:**   For installation, we're talking about $3,000. It depends and can go up to $5,000 to cover a bigger area.

**David Keyes:**   So, if you were to expand, say, from Harborview to some senior unit nearby, is that something to be served by the Harborview connection? What is the range on that? How much equipment do you need to put in between?

**Dr. Kurtis Heimerl:**   In an official telecom network, you're not going to get a lot of variety. But this can get really weird. A high end directional will give you pretty good coverage in the area that it pings. The reality is that it is radio and it does have propagation properties. It depends on where that community is, how far they are away from Harborview, how we want to dole out our frequency for our cells, and to be able to do that, versus what you could do is a long distance WiFi link to that building and then put the gear on the building, itself. So, this is the kind of stuff that we have to figure out on a point by point basis, as we figure out what the needs are and the kind of communities we want to cover. That's why we are talking about turning Harborview into a relay. At the end of the day, it's probably going to be that way, because the things you can ping from Harborview are kind of limited.

**John Krull:**   Where does 5G come in?

**Dr. Kurtis Heimerl:**   All of the open source we're doing is technically 5G. They changed it to open air 5G. But the reality is that anything that is LTE or 5G are very similar technologies. The cool thing for us is that 5G is making smaller units and smaller radios that are going to be even less expensive. At the end of the day, we're going to be able to [unintelligible]... have true 5G capability.

**Steven Maheshwary:**   I think that, trying to provide some context from the board, one of the things that you've probably seen is that we're really interested in digital equity from the perspective of those who don't have broadband access or connection. The latest technology access that came out from the City suggests that 20 to 30 percent of people currently don't have a stable connection in Seattle. Is that right, David?

**David Keyes:**   Twenty-five percent of our low-income folks don't have any connection.

**Steven Maheshwary:**   Right. So, this to us, I think, seems like a really exciting opportunity to scale to provide baseline coverage in those communities.

**Dr. Kurtis Heimerl:**   There are a lot of communities where we could. I think it would be a great starting point for us. We're just in early days, we are going to buy a six radios and we're going to put two up on these two buildings. But other ones going to other places is exactly what we want to do. Our brief surveys have been trying to find the communities and get them engaged in the way we want in order to honestly build equipment for those communities. I think if we have those connections and talk to people, we'll have a chance.

**Steven Maheshwary:**   I don't know if this is necessarily relevant, but we do have a fund or we provide connection to the Technology Matching Fund, which is the  City of Seattle's fund for digital equity grants to nonprofits. This may be an opportunity, in case you need more funding. You could certainly apply.

**Dr. Kurtis Heimerl:**   That sounds great! Now that we have the NGO, the nonprofit, I think that's a good idea. We have thought about whether there is a way to go directly through something like that. We have a lot of limitations, and that's why we have a nonprofit. I think that's great.

**Hilarie Cash:**   Are you doing studies, or have there been studies on the effect of 5G on living organisms?

**Dr. Kurtis Heimerl:**   Again, 5G doesn't mean anything. The idea of 5G has been that we're going to open up some bands above 6 GHz, as well. That perpendicular to 5G. 5G is a small change in radio front end, and a reasonable change to the [unintelligible]. They're going to be using LTE on those. I'll say in general there have been no science saying that any of these things have negative impacts on people. Ionizing vs. non-ionizing types of radiation, but again it's just perpendicular to discussion.

**Rebecca Rocha:**  When it comes to the communities that you will be serving, are there going to be any plans put into place to teach the community to either fix it or repair it themselves?

**Dr. Kurtis Heimerl:**   That's a big element of what we want to do. I think training is going to come into it more and more. One in particular is interested in gender elements of networking. There has been some really interesting work that has been starting, doing some networks in Kenya, where they just added a whole new kind of network and it has changed the dynamics and use of the network in a new and dramatic way. It's so community-dependent At the end of the day, we need deep exchange with these communities if we're going to have them run the equipment and own the equipment, and maintain it. So training is going to be a huge piece of that. There's going to be  bunch of research on the right way to do the training, but also just the execution.

**Rebecca Rocha:**  Right. Because I was trying to be mindful of getting people dependent on something that they, themselves, cannot fix.

**Dr. Kurtis Heimerl:**   Yes. We are aware that we are a university. Where are we going to be at the end of ten years? People are going to graduate. That sustainability element has been forged to this kind of research in general for a really long time. I think it will actually be very interesting to do it in environments here, rather than what we've been doing internationally. I'll say we've been successful internationally. Our international outreach has been running for eight years now. Again, we do SSH, which is the secure shell on the fix itself for software issues. But hardware issues they haven't yet figured out.

**Steven Maheshwary:**   Great. In the interest of time...

**Rene Peters:**  I have one more question. How much unlicensed real estate is available. Is there some doomsday clock counting down?

**Dr. Kurtis Heimerl:**   Do you mean frequency?

**Rene Peters:**  Frequency, yes.

**Dr. Kurtis Heimerl:**   Well, it just gets refiled all the time. It's all going on. It's all news. This T-Mobile thing that they paid $8 billion for is why we had to rescan our television stations three weeks ago or something. They just shrunk all of the TV bands together and opened up that space and sold it out. And it was Comcast and T-Mobile that paid all of the billions of dollars for it. As things like technologies get old, the frequency is so useful that there are companies knocking on the door all the time to try to get more. So, it's always a miracle when things like CBRS happen and we actually allow the small amount of unlicensed frequency. They're now debating having some at 5.8 for just being a new WiFi band. And that will again just be very interesting in what it does to the whole eco-system.

**Steven Maheshwary:**   Thank you so much, Dr. Heimerl. We appreciate you coming out. There is contact information on the screen. Are you okay if we send out the slides with the minutes?

**Dr. Kurtis Heimerl:**   Yes, absolutely! I'm pleased to reach out. There is a bunch of stuff that I would love to follow up on, mostly in terms of finding those communities. I think that's where we're at.

**Steven Maheshwary:**   Okay, great. Thank you so much. Before we move on, feel free to help yourself to some food. There are drinks and salad. I just want to plug that. Now we're going to shift to a very different perspective, something I think has not been well-represented in previous CTAB discussions. I would like to introduce Hilarie Cash. She is the co-founder and co-developer  of the reSTART Gaming and Internet Treatment Program, and co-founder of the Internet/Computer Addiction Services. Hilarie, I don't know if you want to provide more background. I know Charlotte connected you to us. We would love to learn more.

**reSTART**

**Hilarie Cash:**   You can just make this a black screen, because I don't have any slides. I'm Hilarie Cash, and I'm co-founder of reSTART. reSTART was founded ten years ago because two clinicians in private practice have been working for quite a while with folks in our practices who were addicted to video games, pornography, and other aspects of the internet. And we were frustrated because for those when I was working with sex addicts, there were treatment facilities very specifically designed for them, but for video game addicts and others, social media addicts, info addicts, and so forth, there was nothing really specifically designed for them. So, we met one another; we decided to give this a try. It was a project that we ran out of a home, and that was ten years ago. So now we've expanded our services. We have an adolescents' program. We've increased the size of our adult program, and we have a campus in Bellevue where all of the therapeutic services happen. Our program is basically treat programs. The first program is intensive and lasts for nine weeks. During that time, our clients don't have any access to screens. So, they're going through a detox, and literally, t heir brains are taking three to four weeks to come back to normal function. Because within the addiction, the brain has to down regulate in order to function because it has been over-stimulated. It takes time for the brain to relate to normal function.

**Steven Maheshwary:**   First, are you okay with questions during your session?

**Hilarie Cash:**   Yes, absolutely. Just ask as we go.

**Steven Maheshwary:**   Okay. My first question is how do you quantify or determine what addiction is to technology?

**Hilarie Cash:**   Addiction is defined -- the World Health Organization has come up with gaming disorder. Their definition is pretty broad. Essentially, it is when a person has a preoccupation for something, and when they pursue that in spite of its negative consequences. That's really what defines an addiction, and how severe it is varies. So, it can be mild to severe, but it's the negative consequences which really are the defining characteristics of addiction.

**Steven Maheshwary:**   Can you elaborate on one of your clients?

**Hilarie Cash:**   The typical consequences of their behavior? With the adult population, they are typically 18 to 30 years old; they have typically failed out of college. Maybe they're trying to work but they've failed out of work; they've failed out of relationships; they have been living usually at home; they are not working or they can't keep jobs. The negative consequences are social for them. They're very isolated. They've been sitting in front of their screens for years, often. They are socially anxious; they are depressed. They cannot function in the world successfully. So, that's our typical client, and when it comes to the adolescents, they are suffering in the same way, but they're not as far along down the path. So, what's happening with them is that their grades are starting to go down. They're starting to refuse to go to school. And the only thing that holds their interest is to be online, usually playing video games. Most of our clients are male. In ten years, we've had ten women, which is a really interesting statistic. I don't know that the research has been done, not that I've read to explain that.

**Rebecca Rocha:**  I'm a gamer and I can explain that a little bit. It feeds into the hunter/gatherer instinct. The males have the hunter instinct, so it fuels that. My curiosity is that IA know studies are very new in the gaming addiction realm. Do you know what the relapse rate is?

**Hilarie Cash:**   No, we don't know. So, part of the research that we still need to do is really follow up with all the clients and we've been treating them for ten years. If we can follow up and find out how many of them have relapsed and what that rate is, that would be good to know. We have some statistics with the adolescents, but not anything accurate. That is still to be done.

**Steven Maheshwary:**   I don't know if you're planning to talk about it, but just for the purposes of the general public that will get to read the minutes, do you have a general prescription for how to prevent addiction to either video games or technology or the internet at large? What do you recommend for the general public?

**Hilarie Cash:**   Okay, I have many things to say about that. First of all, advice to parents. I have provided, and I hope you will distribute it to everybody, this. It is conservative, but parents will follow it. It is pretty likely that their kids are not going to develop serious problems. I think it's important to be conservative as a parent when it comes to tech use. That's out recommendation. And if you want to take a minute to look at it and then ask me some questions about it, I'm happy to do that.

**Rebecca Rocha:**   We all know that addiction doesn't end with rehabilitation, right? So what is the follow through after that?

**Hilarie Cash:**   I'm just trying to describe our program. I have described our first program which lasts for the nine weeks. They don't graduate out of that program unless they have a recovery mind-set, which is essentially not being in denial and recognizing that they need to change their lifestyle. And they have a really good plan in place. We call it the life balance plan where they are forced to think through in detail how they are going to reengage with digital media. Because they're going to have to use it. In this respect, it's like an eating disorder. They have to use the internet. They're just not going to live a modern life without it, but they have to learn what are the things to avoid so they don't fall right back into addiction.

So, one thing, have a good plan and a recovery mind set. Then they can move on to the second program which is called Open World. And in this program, they are now living in apartments together, up to four people in an apartment. These are sober living apartments. They're not allowed to have drugs and alcohol, and they're not allowed to have screens in those apartments, except for their phones. And these are smart phones that are locked down, so they have very few things that they can do with those phones. And they're expected to get part-time work, to come to the center Monday through Friday for groups and individual therapy and all that, and to use computers. Because we have a computer lab and they can come and sign up for two hours of computer use a day. And those computers are monitored and the phone are monitored, so we can hold them accountable to what they have written down in their plan. And that program lasts on average about six months. It can be longer. It can be shorter. But it's a transition, because when they leave that intensive program, most of them are feeling very confident. They have kind of been on a retreat. The feel they've got a plan, they know what they're doing, they're feeling good and strong. And then they get out into the real world and it's much, much tougher than they could ever have imagined. So they're finding themselves hit with a huge amount of anxiety and their cravings are being triggered constantly, because whatever job they have, whenever they're around other young people, those young people are talking about the latest video games, inviting them to come over and play video games with them, and all of this kind of thing. So they have to navigate all of that and it's difficult. So the good thing about what they can experience is they go out into the world, they have to manage all of those very triggering experiences, but then they get to come home to a recovery environment with other people in recovery. They can talk about their experiences and feel supported.

Then we have a third program, which is called Sustainability, and if they choose to go into that, they move out with other people who they've met within the programs, they get their own apartments, and now they have far fewer services from reSTART. By that time, their phones are unlocked, so they're using their phones normally. By that time, they are getting their computers back, if they want them back. Sometimes they don't want them back, if they feel it's too dangerous. They are working either full time or doing a combination of work and school. Most of them are very, very bright people, and they want to get a college education and pursue an interesting career.  By that time they will have started exploring what they want to do.

**Harte Daniels:** So, about the same time that you started, there was another group working on the same thing, but mostly in the Fall City area.

**Hilarie Cash:**   I think that might be us. because we were in Fall City.

**Harte Daniels:** Were you focusing on using earth and stimulation from environmental awareness and regeneration by connection with the natural world.

**Hilarie Cash:**   Yes.

**Harte Daniels:** That was you? Great. I didn't realize it, because I know some of the people who were associated and brought that out, and that was through a little bit more of a, as I said, environmental education. Your presentation has a lot more scientific, medical grounding. [unintelligible].... Where they're focusing more on the screen, if they're immersed in nature, they are able to take the same kind of stimulation from the outside world, the natural world, as opposed to the artificial. So, I'm really enthused to meet you in person. Thank you for all your work.

**Hilarie Cash:**   And we do now have an adolescent program. We started off just with adults, but we now have an adolescent program in the most beautiful environment you can imagine, and any of you would be welcome to a tour if you ever want a tour. It's 32 acres on a bluff overlooking the Cascade Mountains, and it's gorgeous.

**Steven Maheshwary:**   Where is this?

**Hilarie Cash:**   This is outside of Sultan on Highway 2. And it's glorious. And even on two-thirds of an island. And so we go camping with the kids and all of that kind of thing on the island.

**Harte Daniels:** I'd like to talk to you later. We had a guy from UW who was doing indigenous who posed that question. A lot of this goes back to indigenous teachings about man's place in the earth and our place in society. I would think that would be a great benefit towards that recovery that somebody was asking about.a

**Hilarie Cash:**   One of the ways to conceptualize addiction is the opposite of addiction is connection, connection to others in meaningful ways, connection to one's body in a healthy way, connection to nature. Connectivity is really, really important, and not the IT kind. The human kind.

**Katie Cummins:**   I was reading the grid you provided. Could you explain the difference between pro-social and anti-social media?

**Hilarie Cash:**   Yes. Pro-social media is going to be media in which children are learning how to compete but not in a hostile environment, learning how to be cooperative, learning how to explore together or on their own just with a computer game. It is ll in the service of developing skills and ways of thinking that are going to support their future ability to connection to other people in healthy ways. That would be pro-social. And anti-social is just the opposite of that. There is a lot of controversy around violent video games, but when you're playing a game that is violent, it sometimes can have both elements in it. You can have the pro-social element because you're part of a guild and are having fun and are working together cooperatively, but you also have the anti-social element, often, of violence. You as a parent have to decide what you are going to place in which categories.

**Katie Cummins:**   That's interesting. I think I can understand why pornography is listed for ages 13 to 18. But I can see if you were not straight how that would be helpful for you to see it when you are maybe exploring sexuality. I can see both sides, but that lens of parental judgment does something really critical.

**Hilarie Cash:**   We have found that the clients we have seen over the years, that's been their lifeline. Finding others over the internet. And it becomes a real struggle for them to figure out how to reconfigure their lives and their use of the internet if they're going to be in recovery, but still connect in healthy ways.

**Harte Daniels:** In that community, when adults push back on you, it has a big knee-jerk reaction. It doesn't allow youth to determine their own identity and investigate their own orientation because of the oppression. The other group feels that they've tried to control that younger group into what their teachers say they should be, as opposed to allowing them to develop their own identities. That's a major problem right now.

**Hilarie Cash:**   There are many problems right now with -- they're kind of an underbelly to all of the marvels of the internet. What I have found is that in general we are kind of being swept along as the companies that are developing all of this technology, which is essentially to their profit, they are sweeping all of us along. And we tend to be in that flow, and there's not enough conversation, as far as I'm concerned, with the underbelly and the negatives.So, I think it's important to talk about.

**John Krull:**  I think the tricky thing here is with most traditional addictions, like alcohol or drugs, you get addicted and then you quit. So you don't do drugs anymore, and you don't do alcohol. It seems like for internet addictions, you can't quit totally.

**Hilarie Cash:**   Here is the answer to that. What we have our clients think through is what are the applications on the internet that are addictive for you. It is those things that you can quit. So, if you're addicted to video games, you can quit video games. If you're addicted to porn, you can quit porn. If you're addicted to social media, you can quit social media. You're going to have to use the internet, but you don't have to go to those applications.

**Rebecca Rocha:**  Are there any types that are pre-disposed to becoming addicted. Are there any teachings you guys have about using tech intentionally, as opposed to not using it at all.

**Hilarie Cash:**   We're all about using tech intentionally and developing a balanced lifestyle with technology. That's why we have in our transition programs for the adults that they can come to our computer lab and use those computers for two hours a day, Monday through Friday, so that they are getting used to using the technology again. With our adolescents, they also go through a period of time without any technology, and when they also have a good plan and they also are in a recovery mind set and work with the program, then they, too, can start using computers again for their school work. Because the adolescent program is also school. So, yes, you absolutely have to reintegrate computers into everyone's lives. It's just doing it thoughtfully and healthfully.

**Steven Maheshwary:**   I just wanted to give a chance to folks on the phone, in case they have any questions. Does anyone on the phoe have any questions for Hilarie or for reSTART?

**Torgie Madison:**   Hi, this is Torgie. I just wanted to follow up a little bit.  There's a question on the efficacy of your program. Did you have any data on the long-term benefit of the program?

**Hilarie Cash:**   Here's what I did. A year ago, I was invited to present at a conference that was all academics presenting their research. And they had one small opportunity for clinicians to present in the panel. The person who organized that said, "Hilarie, you're going to be talking to people who really like data, so see if you can pull together some data. So, I sent out to the parents of the teenagers who had been out of our program for at least four months. I sent them, through email, four questions. On a scale from zero to five, how was your son functioning with his internet use before our program, and how is he functioning now? How is your son's overall global functioning? This includes academics and social and physical and all of that. How was your son's global functioning before reSTART and after reSTART. These were parents whose kids had been in the program anywhere from two years ago up to four months graduated from the program. I heard back from half of them, and the overall scores that I got. Universally, before reSTART, they gave their sons a zero on functioning, and post reSTRT, they gave their sons a 4.2 and a 4.1. That's a pretty good outcome. That's the data I can give you. We hear from people informally, and sometimes we hear that they've relapsed and sometimes we hear that they're thriving.

**Steven Maheshwary:**   Great. Any other questions on the call and in the room.

**Torgie Madison:**   This is Torgie again. I have another question. Do you have a program for a licensed therapy program that addresses the underlying causes of addiction. If a person has a situation where they need some medication to treat certain mental illness that's underlying an addictive personality. Do you have a hack for those people who need more medical intervention?

**Hilarie Cash:**   The answer is yes and yes. Everyone who comes to us has co-occuring disorders. They are depressed. They are anxious. They often have ADHD. About  a third of them have traits that we associate with autism spectrum disorder. All of our clinicians are mental health counselors. They are addressing whatever those underlying issues are. But with all addictions, it is very hard to effectively treat the co-occuring mental health problems as long as the addiction is active. Once you stop the addictive behavior, everything starts bubbling up and you can talk about it, you can see it, and you can address it. That's what we do. And then we have on staff a naturopathic psychiatrist, and she can prescribe medications. There is one class of medication that she is not allowed to prescribe, and for those, we can send the clients out into the community. We work with a psychiatrist named [unintelligible]. So, the answer is yes. We can get the medication if they need it. But sometimes, they actually need to come off of medication. Because they have been put on medications without people realizing that part of the trouble is that they were sleep-deprived, totally addicted, and this was why they were functioning so poorly and so were depressed. Most of the people who come are depressed, and most of the people who come, after about a month, are no longer depressed.

**David Keyes:**  We work with some community computer labs around the City, so I'm curious about whether from your experience if you have recommendations for how parents, families, kids, folks in our computer labs should think about setting up computers, setting up phones. Are there things to do in that kind of set-up, that kind of space to help reduce the likelihood of these addictions?

**Hilarie Cash:**   I'm not quite sure what these computer labs are, so are these for families who don't have computers at home?

**David Keyes:**  Either they don't have computers at home, or they have limited services at home, or they come in for classes and training, or their kids come after school to help with homework.

**Hilarie Cash:**   So, you are wondering how to advise parents, basically, so the kids don't develop problems, or so that they stay healthy.

**David Keyes:**  Maybe parents, but also social service providers as surrogate parents.

**Hilarie Cash:**   Well, first of all, I am of the opinion that smart phones, which are powerful computers do not belong in the hands of young children. And so for parents who want to be connected by cellphone to their kids, I would recommend--I don't see why they need that before they're teenagers, but many parents think they do--so I would recommend no smart phones until those kids are in high school. This is conservative, but it can be done and successfully done. Once a smart phone is in the hands of a child, the parent should do the research and figure out how to put monitoring software on it, so that they can from the beginning monitor their child's use. And, of course, they don't do this in secret. There is a conversation with the child. There is a discussion about the rules. Everyone can agree about the rules, and then the parents say, "Now we have to hold you accountable to those rules, so that's why we're installing this."  And as the child matures more and is demonstrating that maturity, then the parents can take that monitoring off and just trust that the child is going to be okay. So, that's one thing I would advise.

Screens should not be in children's bedrooms. Period. And that goes for phones as well as for computer screens. Or if they are using a computer for homework in their bedroom that it not remain in the bedroom when the child goes to sleep. That there's a place in the house, maybe in the parents' bedroom, where those can be placed.

My recommendation is to try to teach kids to check social media or whatever the things are that they want to check at certain times of the day, rather than making their phones available to look at all the time. So, actually turning their phones off and then turning them on so they can check and respond to messages and that kind of thing, so that they're not always at the behest of the phone. Those are examples. And I'd be happy to have a much longer conversation with you, if you would be interested.

**Steven Maheshwary:**   I know we're over time, and I really do appreciate you coming out to speak to us. It is definitely a different perspective than we've had in the past, so thank you again. Actually before I conclude this, is there a way to get in touch with the organization or with you, if people want to reach out?

**Hilarie Cash:**   Yes. I have some cards that I can pass out, and also, if you're interested, I do maintain a listserv for people who are interested in all of the problems of internet addiction and things related to that. If you are interested in that, please contact me, and I'll add you to the listserv.

**Steven Maheshwary:**   Sure. For the purposes of the minutes, are you okay with publishing your contact information?

**Hilarie Cash:**   Yes.  It's hilarie.cash@restartlife.com .425-736-0842. You are all welcome to contact me.

**Steven Maheshwary:**   Thank you. In the interest of time, I figured we could just power through the break, since we've all had a chance to get food. If people are okay with it, we can just chug along into our committee updates, which won't take too long, and then we can adjourn the meeting. Are people aligned with that? Let's just jump to the committee updates. Rene, would you like to give an update for Smart Cities?

**COMMITTEE UPDATES**

**Smart Cities Subcommittee**

**Rene Peters:**   Yes. We've been pretty busy. When was the last time this body met?

**Steven Maheshwary:**   Two months ago.

**Rene Peters:**   We've been pretty busy. We've had a couple of Smart City meetings. At this point, we've finalized the focus areas that we want to build out, as far as our two research thrusts. For everybody in the room, we have two white papers developing. One is on predictive policing and facial recognition technology. The other one is on AI and IOT management of public infrastructure. For both of those, we sort of honed in on the areas that we want to build out. We drafted more formal formats for both of those papers, and we sent both of those drafts to you. Maybe you can speak a little about those events that you had?

**Steven Maheshwary:**   Yes, I can. I recently had the opportunity to speak with the King County Bar Association. They had a full-day panel through their continuing legal education series on Artificial Intelligence as a way to rescale some of their lawyers legal education. And so one of the panels that I was on AI and stakeholders needed for responsible AI. As a part of that, I was able to share materials that CTAB had produced, especially stuff that the Smart Cities Subcommittee had produced in terms of how we think about Artificial Intelligence technologies, the advisory comments that we put out. Especially with Smart Cities, because there is such a strong overlap in terms of the infrastructure, AI in the City with actual AI. It was really helpful for the lawyers in the room to see how boards like ours operate. What do we do? Why are we at the table? What are the things that we think about? That wasn't at a high level in terms of the discussion, itself. A lot of it was focused on the global implications of AI. It kind of went off the rails a bit, talking about China and their social credit system, not necessarily as relevant to the things I wanted to talk about. It was a great opportunity to provide visibility to them. One thing I would say is that next month, since that's our last meeting of the year, it would be great to put that out, the materials that you have at the point. Just so they can see the progress.

**Rene Peters:**   To the rest of the board?  Yes, absolutely. So, as I said before, we are close to building out a formal formatting, and we have our focus areas. We've also been involved in other engagements. We talked at the Rec Tech program at the Delridge Community Center. Engaging with those students was really, really fun. Maitreyee Joshi and I did a presentation on What Is a Smart City, and we actually were able to engage them to help out with our research. They are currently doing field research, going out into neighborhoods and engaging people's understanding and sentiment on various aspects of Smart Cities tech. And then, finally, we did one of the talks for the Emerging Technologies series at the Seattle Public Library. Kreg Hasagawa was really great in making that happen. It was another really interesting discussion, so thanks for that. And we meet on Tuesday, November 19 at 6:00 p.m. at the Capitol Hill Starbucks on Olive Way. Feel free to show up.

**David Keyes:**  Rene, was there a timeline for a meeting on these research papers. Do you want to present that and get feedback?

**Rene Peters:**   Yes, December would be a good time for a summary, and then, when we've finished the formal write up, we will circulate for edits, feedback, and all of that. All of our documentation is available. Just get in touch with smartctab@gmail.com. That's our email address. The documents are Google Docs, so anyone can review.

**David Keyes:**  We were also thinking about, if there was a time to set that up, because we're trying to get the agenda settled for this meeting a couple of weeks ahead so we have time to circulate it, so more people are aware of what's happening. So, if you want us to put a link into the next one, because there is a broader list of CTAB members who have shown interest. So, if you wanted them to look and comment directly?

**Rene Peters:**   I'll pow wow with Maitreyee and get back to you.

**Steven Maheshwary:**   Moving on, John Krull, do you have an update on Digital Equity? I know last month's event was basically a Digital Equity event, but in case there is other stuff you want to add?

**Digital Equity Subcommittee**

**John Krull:**   Yes, I want to tick off having the Digital Equity subcommittee meeting again at the Chinese Information Service Center. We meet on the Tuesday between the CTAB meetings, so the next one is Tuesday, November 26, at 6:00 p.m. That's in the International District at 611 Lane Street.

**David Keyes:**  That's just before Thanksgiving.

**John Krull:**   Yes, is that okay?

**Steven Maheshwary:**   To me, that's fine, as long as you have people who are interested in coming at that time. It's not a formal CTAB meeting, so....

**John Krull:**   So, I'll send out again to the CTAB list.

**Steven Maheshwary:**   At the end of the year, it would be helpful to just recap some of the things that you've been thinking about or doing for Digital Equity for the year, just so that the rest of the board and the public gets a refresher. It would be great to have that, as well. Torgie, do you have an update on the Privacy Committee.

**Privacy Committee**

Torgie Madison:   There is no current update on the Privacy Committee. We are waiting for the list of technologies to become available for public comment. There is something you mentioned that would be good for the leadership of these committees to produce for the December meeting a quick, one-page recap of what the committees have been up to for the year, just so we can share what sort of services we've been up to.

**Steven Maheshwary:**   Yes, I think that's a great idea. Maybe we could put together a one-pager or whatever amount of information you need to describe what we have been doing for the year. And I'd certainly be happy to take that on for the board overall, as well.

**David Keyes:**  Yes, just to build on that use, because in the past, we have posted an annual list of accomplishments  on the CTAB web site and it may be something that might be useful for your meeting with any other new City Councilmembers.

**Steven Maheshwary:**   We typically share those out in that format at the beginning of the year to the new City Council and to the Mayor, so it would be helpful for that purpose, as well. Before we adjourn, I would like to say that next month is our final meeting of the year, which is also when we tend to have elections. In this case, the vice chair roles are two, and the chair role, the one that I currently occupy, both will be available, so anyone and everyone on the board can nominate themselves for the position. There are also the subcommittee leadership positions. Typically, we haven't really done elections for those. People can just volunteer to continue leading the group, or to help lead the group. So, I will put that out there. I'll send out a formal email about how I expect the proceedings to go down for the election next month, so that we have proxy votes and we have all of the nominations ahead of time. So keep an eye out for that. Are there any questions about that? I believe Mark DeLoura is going to be terming off after next month, unfortunately. So, we will try to hopefully get the Mayor to fill in that vacancy or let us fill in that vacancy in 2020.

**Charlotte Lunday:**   This is Charlotte. I have a couple of announcements. I'm going to be stepping off in December, as well. I have joined Washington Technology Industry Association. They have an event next Tuesday. I thought I would let everyone know about it. It's a panel discussion called Bait and Switch. One of the things that interests me in this group is that one of their panelists will be talking about how blockchain is being used to ethically [unintelligible]....   That is next Tuesday, November 19, from 6:00 to 8:00 p.m. It is at 216 Columbia Street, which is not very far from the Municipal Tower. I can send out that information, and put that on our Facebook page. I thought I'd let everyone know.

**Steven Maheshwary:**   That's great. Sorry to hear that you are going to be rotating off. We will miss you. Are there any more comments from any board members.

**David Keyes:**  I'll just mention another announcement. Two Technology Matching Fund grant workshops are coming up. The deadline for our grant program is January 13, I think. A workshop is coming up Friday morning, the 22, at the Northgate Library, that's at 10:30. And then another one on Saturday, December 7, at 10:30 at the Rainier Beach Library. If you want, I'll send out another reminder or something. We've had one workshop so far. It's great to hear the projects that people are interested in.

**Steven Maheshwary:**   Great. Do you know when we will find out about when we can be on the review panel?

**David Keyes:**  Delia Burke will be coordinating the review panels. You can let me know or let her know directly. Those will start up--there will be an orientation on it soon after January 13, about a week and a half or so after the deadline. Let her know if you are interested. I think she has been focused on getting the material out. She'll probably just confirm and set that date with you.

**Cass Magnuski:**  Next steps?

**Steven Maheshwary:**   Next steps: Go to all of the meetings that were mentioned today, if possible. If not, I will see you in December. Hope we'll have an after event location to gather for the end of the year, if people want. Other than that, enjoy the holidays, and we'll see everyone in December.

**ADJOURMENT 7:30**