



**Kewaunee County
BROADBAND STUDY COMMITTEE**

May 22, 2019 4:30 p.m.

Kewaunee County Administration Center, 810 Lincoln Street, Kewaunee, WI 54216
Human Services Training Room

1. Call to Order
2. Roll Call
3. Approval of May 22, 2019 Agenda
4. Approval of April 24, 2019 Minutes
5. Discussion of Potential Options/Paths: Fixed Wireless, WiFi Mesh
6. Update on Broadband Expansion Grant – Tower in Town of Carlton
- 7.
8. Such Other Matters as Authorized by Law
9. Next Meeting – June 26
10. Adjournment

Committee Mission Statement

“The mission of the Kewaunee County Broadband Study Committee is to research and gather information to educate the County Board and the community as to the various options and their costs required to serve the broadband needs of its citizens and businesses, and to encourage providers to invest and provide those services in Kewaunee County.”

The Committee welcomes all visitors to listen and observe, but only Committee members and those invited to speak will be permitted to do so. Persons with disabilities needing special accommodations to attend or participate should contact the County Administrator's Office at (920) 388-7164 prior to the meeting so that accommodations may be arranged.



**Kewaunee County
BROADBAND STUDY COMMITTEE
MINUTES**

April 24, 2019 4:30 p.m.

Kewaunee County Administration Center, 810 Lincoln Street, Kewaunee, WI 54216
Human Services Training Room

Call to Order: Chair Weidner called the meeting to order at 4:30 p.m.

Roll Call: Members Present – Robert Weidner, Gary Paape, Aaron Augustian, Tom Cretney, Mary Ellen Dobbins, Virginia Haske, Lee Luft, Tom romdenne, Scott Feldt, Steve Hanson, Ross Loining, Jeff Wisnicky, Ryan Hoffman, Kim Larson, Frank Mazdarevic, August Neverman. Additional Attendees – Jason Huston.

Approval of Agenda: Luft moved and Hoffman seconded to approve the agenda. Motion carried.

Approval of Minutes: Paape moved and Cretney seconded to approve the March 27, 2019. Motion carried.

Discussion of Potential Options/Paths: Neverman went over with the committee the results from the Google survey that was sent to committee members. Throughout the survey, the vast majority of the respondents strongly agreed or somewhat agreed that high speed internet service was needed in all of the areas indicated in each individual question. This translated into the need for high speed internet service everywhere in the county is important. Respondents indicated that 25 Mbps was the lowest download speed that should be made available to users. Respondents also indicated that the private sector, whether alone or part of a public-private partnership, should be the primary service provider. The survey respondents were split 50/50 on whether it is critical for the county to use the cheapest solution to provide good internet access to 90% of the county. They were also split 50/50 on whether it is critical for the county to provide high speed internet access to 90% of the county regardless of the cost. Additional discussion followed the survey results.

Another discussion took place regarding the idea of wifi mesh technology. Neverman provided a very general description as he not versed in the technology. Wifi mesh was likened to wireless internet in the home or business where multiple routers are present to help ensure signal and access. Wifi mesh could be considered a much larger version of that. Discussion followed as to where this might start and how the service would be rolled out. Questions were raised regarding cost, reliability and maintenance. It was agreed by the committee that additional information should be obtained for the next meeting.

Such Other Matters as Authorized by Law: None.

Next Meeting: May 22, 2019 at 4:30 p.m.

Adjournment: Paape moved and Hoffman seconded to adjourn the meeting. Motion carried. Meeting was adjourned at 6:34 p.m.



Kewaunee County
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April 24, 2019 4:30 p.m.

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Submitted by:

A handwritten signature in black ink that reads "Scott Feldt". The signature is written in a cursive, flowing style.

Scott Feldt, Recording Secretary

BRIDGING THE OPPORTUNITY DIVIDE

HOW COMMUNITY-OWNED WI-FI CHANGES THE GAME FOR POOR NEIGHBORHOODS

MENU

May 29, 2018
by Angely Mercado



Photo courtesy of The Point CDC

Thanks to mesh Wi-Fi networks, residents in low-income neighborhoods can stay connected at little to no cost.

MESH NETWORKS CAN COME TO THE RESCUE IN TIMES OF DISASTER, WHILE ALSO WORKING TO REDUCE THE DIGITAL DIVIDE.

Dabriah Alston knows her home is at risk of flooding.

As a resident of Red Hook, a waterfront Brooklyn community, she saw firsthand the devastation wrought when Superstorm Sandy hit New York City in 2012. The public-housing resident was inside her apartment when she and her family noticed how quickly the water was flooding into the street.

“I remember that the water started lapping on the windows of the first floor of the building, and that’s about five feet off the ground,” she says. She saw cars floating down the street. The lights began to flicker until they eventually went out. They wouldn’t turn back on for another 13 days.

All in all, it took the neighborhood over a month before things started to feel normal again. But there was something invisible that saved her, along with hundreds of other Red Hook residents, the majority of whom live in public housing: the neighborhood’s open Wi-Fi network.

Unlike personal networks that most people access in their homes via a single router, residents can connect — for free — to the area’s mesh network, which uses a system of nodes, or hot spots, strategically placed throughout the neighborhood. The nodes are accessed via cell phones and laptops and, in the case of an emergency, allow people to communicate with each other even when the internet is down.

For the people living in Red Hook, an area that is already remote by New York standards, that access was crucial. After Superstorm Sandy, the area had no power or cell service, much less reliable internet. It was, more than ever, off the grid.

Luckily, the neighborhood's mesh network — set up by volunteers with Red Hook WiFi in 2012 before the storm — gave first responders and residents online access to exchange crucial information, such as official evacuation routes and where to go for food and first-aid supplies.

“When the [mesh was installed] we didn't know it was something we would need, something that would become pivotal during the recovery,” Alston says. “At one point FEMA was using that Wi-Fi as well. It made it easier to find people who could volunteer, and it supported [Red Hook's] recovery.”

The area's mesh network is an offshoot of the Red Hook Initiative, a nonprofit that works in part to empower youth in Brooklyn through tech training, among other academic and job-prep programs. Mesh networks had already proven successful in Detroit, where a Digital Stewardship program had been set up by the Open Technology Institute that allowed neighbors to connect with each other wirelessly, even in the event of an internet outage.



Photo courtesy of Red Hook Initiative

Red Hook Initiative teaches Brooklyn youth tech skills including mesh Wi-Fi installation.

“That’s our hope, that the network is used as a source of communication throughout the neighborhood,” Robert Smith, a digital steward in Red Hook, told the New York Times in 2014. “We want to have both, that second layer, so if the Internet goes down we can still connect with each other through the mesh.”

The success of Red Hook’s mesh during and after Superstorm Sandy has led community organizers in other areas with similar characteristics — remote, largely low-income, and at risk of flooding or other climate change—related disasters — to follow in the coastal community’s footsteps.

It’s also a handy solve for the city’s “digital divide,” the term used to describe the lack of access to internet in poor neighborhoods, such as Red Hook and parts of

Harlem and the Lower East Side in Manhattan. According to a report released last year, over 1.6 million households in New York City lack basic broadband internet.

The only costs for accessing the internet via a mesh network is the equipment — a rooftop router ranges from \$60 to \$100 — and upkeep, which is done by volunteers in some cases. And organizations that install a mesh oftentimes only ask for monthly donations — sometimes as little as \$20, a pretty nice price-tag considering that service from a conventional ISP can cost hundreds of dollars a year.

“The big companies would have you think that there’s no option than them, especially in New York City,” Jason Howard, a volunteer programmer with NYC Mesh, told the CBC. “It’s so refreshing to come across this ability to do something else as an alternative.”

The network that NYC Mesh operates, which includes dozens of nodes in low-income neighborhoods mostly in Manhattan and Brooklyn, gives users internet speeds close to 100 megabytes per second (for perspective, Netflix requires 5 mbps for high-definition streaming).

In the Hunts Point neighborhood in the South Bronx — one of the country’s poorest, with 14 percent of its 52,200 residents unemployed — The Point Community Development Corporation is working on a mesh network of its own. Besides providing free internet to those unable to pay for at-home Wi-Fi, the nonprofit sees it as insurance against future disasters Mother Nature might throw its way.

“During Sandy, [the Red Hook Wi-Fi] network helped people communicate with their neighbors,” says Angela A. Tovar, director of community development at The Point CDC. “Hunts Point is by the water too, so it’s important to plan for the next storm.”

Similar to Red Hook's initiative, The Point CDC's program, launched last September, hires residents at minimum wage to work as digital stewards. They are taught tech skills, such as coding, and help set up the mesh network, which includes the harrowing task of accessing rooftops and climbing towers to install the nodes and routers. Citi Foundation has invested more than \$500,000 into the ongoing project, which will eventually include nodes on 10 local businesses and three high-rises in the area.

Superstorm Sandy crashed into Red Hook more than five years ago, but the destruction it brought remains fresh in the minds of residents.

"I still think about the storm a lot," says Alston, who sees a silver lining. "It's brought the community together and it gives us a feeling of empowerment [that] we don't have to be caught unaware anymore."

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SHOW COMMENTS

12 communities experimenting with mesh networks

Mesh networks help people stay connected while avoiding traditional internet providers. Motivation around the country for creating community mesh networks ranges from a desire for social justice, improved information access during natural disasters or just the need to experiment.

A mesh network creates reliable and redundant wireless internet access. Instead of relying on a wired access point to the internet like a traditional network, a mesh network uses wireless radio nodes that speak to each other, thus creating decentralized wireless access points. Because a mesh network does not have to communicate through a central organization (like an ISP), if one node goes down the network will self heal — allowing service to continue without interruption.

You are probably wondering, how is this different than your WiFi at home? For one, mesh networks are actually wireless. If you think of your at-home wireless router, it is wired directly to the internet. Within a mesh network, only one node needs to be hardwired. All the other nodes, of which there could be hundreds, do not require direct access to the internet, just access to the mesh network itself. This allows a mesh network to operate without laying new cable, or as a local network during a service outage.

The application of mesh networks varies depending on need and environment. Here are 12 community mesh networks around the U.S. we checked up on:

[Redhook Wifi](#), Brooklyn

In 2013, when we last [checked in](#), **Redhook Wifi** had just been tested by Hurricane Sandy. **Tony Schloss**, the director of community initiatives, gave us an update: “It is clear that having a locally controlled and maintained network is critical in those emergency situations.” However, in non-emergency moments, Schloss questions the overarching value of the mesh network because so many users pay for internet access. No matter how residents connect to the internet, Schloss thinks education is critical. Building off of the **Digital Stewards** program (see Detroit below), Schloss says their work is ultimately about “creating real opportunities for the young adult participants in career options, social capital, and attitude shifts in their confidence regarding tech.”

[Bamboowifi](#), Philadelphia

Bamboowifi is a wireless internet service provider that operates through a mesh network. Back in January, we [reported](#) on Bamboowifi and its then-upcoming **Kickstarter** campaign. After just a few months, cofounder **David Platt** already has lessons to share. “General interest has been overwhelmingly positive. Anyone we’ve spoken to about the concept seems very interested in our different approach to providing internet service,” said Platt. Even with this interest, [the Kickstarter campaign](#) and recruiting local businesses as hotspots has been slow. Platt believes that they need to build a pilot zone to make the concept concrete for potential partners. All the same, Platt continues to build their project and is looking to potential grant funders and investors to make Bamboowifi a reality.

[SMesh](#), Baltimore

Fifteen years ago, SMesh sought to create something new: a seamless mesh network. When the project started at **Johns Hopkins University**, seamless transfer supporting VOIP, for instance, was not an omnipresent option like it is today. After significant experiments at Hopkins, and the development of less expensive technology, the SMesh program now lays dormant. **Yair Amir**, a Hopkins professor of computer science and member for the SMesh team, points out their code is still open and useable for anyone interested in their work. Amir is not bothered by the project's passing, "We do research, some of it sticks and some of it doesn't." SMesh, he says, was a worthwhile experiment for its time, now his focus is on the next generation of internet services.

[Meta Mesh](#), Pittsburgh

Meta Mesh and [PittMesh](#) got started in Pittsburgh's South Side neighborhood. Their aim was to provide a local network that upheld privacy and freedom for its users. Their motivation for increased privacy became acute after it was revealed that the **National Security Agency** was collecting individual data through backdoors in traditional cloud services and ISPs. The Meta Mesh project requires that all traffic is encrypted. According to a video produced by Meta Mesh, they hope that interest from local innovators and "nerds" will help grow and improve the two-year-old network.

[Digital Stewards](#), Detroit

The **Digital Stewards** project in Detroit is more than a mesh network — it's a social movement. Born out of the [Detroit Digital Justice Coalition](#), the mesh network is just one way they create equal access to media and technology. This work is particularly important in Detroit where a 2012 study reported that 40 percent of residents were without internet access. Beyond maintaining six networks around Detroit, they also developed a curriculum to improve digital literacy. This curriculum is being adopted around the world, including by Redhook Wifi (as mentioned in this article). For **Diana Nucera**, program director of the **Detroit Community Technology Project**, it is all about access, no matter where you get it. Nucera points potential mesh network advocates to [Commotion's setup wizard](#). "You don't need a B.A. in Information Technology to try out [a community mesh network]," she said.

[NYCWireless](#), New York City

For **Dana Spiegel** and the folks at **NYCWireless**, creating a mesh network was about hacking new technology (in 2000) and bringing untapped value to community spaces. "We saw an opportunity to hack together a way to use internet access ... to bring communities together into our shared spaces," said Spiegel. Beyond public spaces, NYCWireless is also putting networks into older buildings. The nodes allow for approximation making implementation much easier than laying new wires. Looking forward, Spiegel is emboldened by **Mayor Bill de Blasio's** interest in public internet. NYCWireless promises to be a strong voice advocating for an open and democratic internet.

Personal Telco, Portland, Oregon

After the 2000s dot-com bubble, Portland had a number of unemployed IT people looking for faster internet than what their at-home dialup allowed. **Personal Telco** wanted to leverage new wireless technology to fix this problem. In the beginning, the problem setting up this network was not the nascent technology, but the trees. The verdant Northwest's tall evergreens would block the signal, making the network patchy. This challenge turned Personal Telco's focus to urban (read: less treeful) parts of Portland. "Most of our networks today are stand alone hotspots that someone sponsors," said **Russell Senior** at Personal Telco. Senior hopes that Personal Telco and the philosophy behind it will persuade public policy makers that Portland needs a publicly owned internet utility. So far, Senior says, this effort is a work in progress.

MileMesh, Hoboken, N.J.

Hoboken learned how weak the internet is the hard way. After Hurricane Sandy, the New Jersey community was frustrated by broken and unresponsive communications infrastructure. As a community organization MileMesh's goal is simple: cover Hoboken with reliable connectivity. According to their Twitter account, they are just getting started: the first MileMesh node was launched less than a year ago. With a \$3,000 grant from NYCWireless, the expectation is to expand throughout Hoboken's 1.3 square miles. **Anthony Townsend**, founder of NYCWireless, told TechPresident that expanding mesh networks was not about a starting a company or a project, "We're trying to start a movement."

Wasabynet, St. Louis

Wasabynet started as an experiment. Cofounder **Ben West** explains: "We saw the inherent bottoms-up and all-inclusive spirit of a mesh network like Wasabynet as a natural companion to the bootstrapped cultural and economic revival already taking place [in the Cherokee Street community]." With initial support from the Incarinate Word Foundation, other St. Louis neighborhoods are reaching out to West and his partner, **Minerva Lopez**, to expand the mesh network footprint. For the time being, however, West is exploring solar-powered nodes to make Wasabynet reliable in a power outage.

TFA Wireless, Houston

Technology for All in Texas aims to close the digital divide for the underserved and vulnerable. Part of this mission, in partnership with **Rice University**, is **TFA Wireless**. Started in 2004 and based in Houston's underserved East End, TFA Wireless has continued to expand. According to their website, by 2011 TFA Wireless had provided the first residential deployment of "Super WiFi," a long-range, barrier-piercing wireless network. The partnership with Rice has allowed for study of high-impact, low-cost networks and the development of new health-sensing applications in an attempt to catch public health issues early.

Meshnet Project, Seattle

Just a couple of years ago Seattle did not have a mesh network. For **Dan Ryan** and his colleagues, this was an opportunity. Now, there are a few dozen nodes in Central Seattle and the Ballard neighborhood. On the security side, **Meshnet** is unique. They use **cjdns**, a networking protocol that requires that each computer verify itself cryptographically instead of using a single, public IP address. This level of encryption will continue as the project grows and adds cjdns for Android users. Ryan is excited about the project and thinks its value has not been tested yet. "It could potentially play a significant role in future natural disasters [if] traditional networks are nonfunctional," he said.

La Cañada Wireless Association (LCWA), Santa Fe

The **La Cañada De Los Alamos Land Grant area** outside of Santa Fe, New Mexico is rural. According to the 2010 census, 434 people lived there. Locally owned and operated by its members, this project provides low-cost internet in an area with lacking infrastructure. Instead of creating a mesh network that covers an entire geographic area, **LCWA** focuses its nodes to jump directly from an access point to a member's home. According to their website, this allows an unobscured access point to reach a home up to ten miles away. While it is unclear if the **LCWA** is still fully functional, the model is none-the-less important to note, because it illustrates the application of mesh networks outside of urban areas.