

C Spire Rural Broadband Consortium

Final Readout Event Summary

March 30, 2021

Introduction

Ben Moncrief, Sr VP, Strategic Relations, C Spire

C Spire kicked off this research effort in January 2019 to address rural broadband. The C Spire Rural Broadband Consortium includes Airspan, C Spire, Facebook, Microsoft, Nokia, Siklu, and Telesat. Its goals were to test broadband technologies, create new business models, and share digital skills with communities. Remember, rural broadband is not really primarily a technical challenge, it is an economic one.

For more information <https://www.cspire.com/web/wireless/rural-consortium>

Technology and Trials Overview

Ivy Y. Kelly, Ph.D., Distinguished Member of Technical Staff, Technology Strategy, C Spire

Technology, particularly access and backhaul is a critical component in the rural broadband equation, as it can make or break a business case before a project even begins. Technology is tied to market morphology, and there is no silver bullet or one-size-fits-all technology that can be used anywhere and everywhere. The consortium studied a variety of access and backhaul technologies matched to appropriate environments as well as their impact on the business model in terms of infrastructure access and enabling local Mississippi WISPs.

For more information:

- <https://www.cspire.com/web/wireless/consortium-tests>
- <https://www.cspire.com/web/wireless/rural-broadband-business-models>

Massive MIMO capabilities and performance in a rural environment

Mark Lassig, Customer Solution Architect, Nokia

The Nokia massive MIMO Band 41 LTE solution is a high-capacity multi-antenna technology which was tested in a rural environment (small towns and scattered homes). Single-user tests showed high throughput at low signal levels. Multi-user tests showed improvement due to MU-MIMO, but there were not enough users tested to strain the system, unlike in a dense urban environment.

For more information:

https://www.cspire.com/resources/docs/consortium_tests_pdfs/MassiveMIMO_Bulletin_Feb2021.pdf

Wi-Fi 6/6E Rural Opportunities

Jaime Fink, VP Technology - Fixed Wireless, Product Marketing for Mimosa by Airspan

Opening up the 6GHz band has the potential to enable Gigabit speeds in Fixed Wireless. New capabilities for Wi-Fi 6E for fixed wireless include 160 MHz channels and 1024QAM due to low noise (compared to the 5 GHz band) using the Automatic Frequency Coordination and the OFDMA physical layer of 802.11ax. While the coverage will be limited compared to 5 GHz due to lower power, 6GHz should prove to be a Gigabit tier within a multi-tiered spectrum approach to rural broadband connectivity.

For more information: <https://www.airspan.com/rural-solutions/>

Telesat Lightspeed for Telcos

Jiby Thayyil, Senior Product Manager, Telesat

Telesat helped produce a case study of two rural Canadian communities that indicates how enterprise-grade LEO satellite backhaul, such as Telesat's Lightspeed for Telcos, can significantly improve backhaul costs where fiber infrastructure is hundreds of miles away. Using a 3rd party business model enables a lower cost of ownership.

For more information:

- https://www.cspire.com/resources/docs/rural/CS_RuralBroadband_CaseStudy2.pdf
- <https://www.telesat.com/leo-satellites/>

Terragraph and Digital Inclusion

David Sumi, VP of Marketing, Siklu

Digital Inclusion, connecting everyone to the internet with high speed, high quality services, is today a requirement, not a luxury. There are many technologies that aim to address this challenge, and Gigabit Wireless Access powered by Terragraph is a key component in the Service Providers Broadband Toolbox to achieving this goal.

For more information:

- https://www.cspire.com/resources/docs/rural/CS_RuralBroadband_Article_202011.pdf
- <https://www.siklu.com/product/multihaul-series-tg/>
- <https://terragraph.com/>

Challenges and Opportunities to Sustainable Rural Connectivity

Roger Greene, Facebook Connectivity

The Consortium explored challenges and opportunities of enabling WISPs by connecting 5 rural Mississippi towns with 3 local WISPs. Infrastructure (fiber and tower) access, capital, and technical resources are key challenges uncovered, while new planning tools, new fiber breakout and access models, new access technologies, and new partnerships and business models are key opportunities. Facebook and C Spire are working together on methods and procedures to more efficiently provide

access to fiber for high speed backhaul and towers to facilitate broadband access. Facebook has launched an ISP Toolbox to help ISPs with business and network planning.

For more information:

- [https://www.cspire.com/content/dam/final/documents/whitepaper/CRBC_Connectivity_Challenges%20 Whitepaper_202103.pdf](https://www.cspire.com/content/dam/final/documents/whitepaper/CRBC_Connectivity_Challenges%20Whitepaper_202103.pdf)
- <https://www.facebook.com/isptoolbox>

3rd Party Enablement Business Models

Mitchell Jordan, Director, RF Engineering & Design, C Spire

The 3rd party enablement business model is basically two parties working together to serve the end customer. 3rd party enablement can pair different types of local 3rd parties, including Established ISPs, Nascent ISPs, Infrastructure Providers and Local Stewards. Established WISPs, for example, have close ties to the local community, with a better idea of needs and demands, and can move more quickly than larger telecom companies.

For more information:

https://www.cspire.com/resources/docs/rural/CRBC_BusinessModels_WhitePaper_202012.pdf

Digital Skilling: Supporting Adoption

Erica Myers, Lead – Airband US Rural, Microsoft

Microsoft's Airband partnership is all about 3rd party enablement to serve rural America. Microsoft partners with the National 4-H Council, Future Farmers of America, and the Public Library Association to deliver digital skilling that ranges from basic digital literacy to advanced computer science. Microsoft offers digital skilling online resources as part of its Global Skilling Initiative. Microsoft launched the next stage of their skills initiative after helping 30 million people. Microsoft promotes LinkedIn's resources that provide training in 10 career paths to achieve certifications that lead to jobs, many of which offer the ability to work remote. COVID-19 required a pivot to some creative service delivery models.

For more information: <https://www.cspire.com/web/wireless/rural-consortium-training>

Closing Challenge

Alan Jones, SVP, Engineering and Development, C Spire

Rural broadband is a multi-faceted challenge. The only way to solve it is to look at the problem holistically. Programs should be broad reaching, not just solving one problem. Everyone must come together and form new partnerships to make a real difference.