KGI Communication's
Deployment of Baicells LTE-U Solution

2019 - LTE-U Case Study

KGI COMMUNICATIONS

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The Situation

King George County is located in rural Virginia, and is home to roughly 25,000 residents. Covered in deciduous forests that reside on gently rolling hills, the majority of rural residents have limited internet options, having to resort to poor cable or satellite connections. The cable internet is overloaded resulting in slow speeds for end-users, while satellite provides unreliable service. There is a growing demand for fast, reliable internet in this area for both residential and business customers. Such a demand, in fact, that the local government has gotten involved with KGI Communications to assist in deploying the new internet solution.

KGI Communications is a WISP located in rural King George County and was established by Juan Marte and Michele Wido in 2017 due to the lack of high speed internet connectivity in the county for residents and businesses. KGI was born from the frustration of the CEO of CRC Contracting Inc, a local King George County company that works at a national level. Internet was necessary for the growth of CRC Contracting, and the lack of connection made it very difficult to communicate with clients and suppliers. The idea of moving CRC Contracting out of King George arose; however, many King George residents were in similar predicaments. As a result, Mr. Marte and Mrs. Wido decided that they would bring internet to King George County. Thus, KGI Communications LLC was conceived.

The Situation

However, KGI Communications immediately ran into trouble. While the budding WISP had planned on utilizing LTE and 3.65 spectrum to connect residents to the internet they quickly came to realize that getting a 3.65 license would be extremely difficult due to the proximity of several ground stations and a naval base. As a result, KGI turned to unlicensed 5GHz solutions and finally settled on Baicells LTE-U product line due to the reliability of the connection, the quality of the equipment, its long range and throughput.

"This is the first opportunity we have to provide the residents of this county with a solid, reliable alternative to the cable company that has taken a monopoly on the internet services in King George county," said Michele Wido, President of KGI Communications. "We've seen the lack of internet service quickly become one the largest problems within our community and we're committed to working with our local representatives to ensure that we fix this problem."

"The tenacity and persistence of KGI Communications to solve our internet issue is paying off in a big way for our residents," said Ruby Brabo, At-Large King George City Supervisor. "This is truly a game changer. The Supervisors look forward to continuing to work with them to accomplish the deployment process as quickly as possible."

The Solution

KGI Communications deployed 4 Spectra eNBs on November 7th, 2018 to begin providing the residents of King George County, Virginia, with an reliable, high-speed internet solution. The base stations were deployed 400 feet up on a 450 foot private radio tower, pointing North, South, East, and West. The Spectra's integrated 45° horizontal antenna allowed KGI to provide near 360° LTE coverage for deployments at 2 - 8 miles away.

The Baicells Spectra Long-Term Evolution – Unlicensed (LTE-U) 2x320mW eNodeB and u4G-UE1000 CPE enables smart mobile device users to be served by unlicensed 5.8 GHz spectrum using Frequency Division Duplexing (FDD) technology. Providing the stability and bandwidth of LTE service while avoiding the cost of licensed spectrum is a significant advantage for wireless operators.

The Solution

LTE-U outshines Wi-Fi with better capacity and coverage for multiple users, efficient power usage, guaranteed security authentication, and robust QoS. It has been built to operate well regardless of interference, and Spectra LTE-U's forthcoming and incremental capability of harmonizing licensed and unlicensed bands echoes key 5G radio access goals known as Licensed Assisted Access (LAA). It is an attractive option for operators since it increases network capacity while limiting the CAPEX investment.

The Spectra features a lightweight, robust design to make deployments easy, and comes with an integrated antenna allowing the device to be plug-and-play, right out of the box.

Results & Benefits

Five deployment sites were chosen to receive the LTE-U signal. Throughput speeds varied due to location of the end-user, the topology and the foliage that may of interfered with signal strength.

Results & Benefits

The five different deployments provided KGI with an initial bed to layout further LTE-U installations. All deployments were within pockets of serviced areas that couldn't receive internet otherwise.

The chart below shows the 5 deployment sites that were chosen, showing direction from the tower, distance, and whether the deployment was Line of Sight or not. Recorded uptime of the units since time of deployment shows 99.99% reliability.

	Direction from Tower	Distance (miles)	Line of Sight
Site 1	East	5	Yes
Site 2	Southeast	6.3	Yes
Site 3	South	2	Yes
Site 4	West	8	Yes
Site 5	Southwest	2.5	No

It's important to note that the final deployment at Site 5 was done testing the LTE-U's NLoS capabilities. While Baicells does not recommend the Spectra be used in a NLoS scenario, this deployment proved that the LTE-U connection is able to to not only perform, but maintain a consistent, reliable internet connection.

Use Cases

KGI Communications is utilizing LTE-U to connect rural residents who do not have internet access, and the products have been built to accommodate such deployments by taking into account interference levels, connection distance, reliability and strong throughput. While the product line excels at rural connectivity, LTE-U is also being used in enterprise and vertical markets due to its unlicensed nature. Currently the LTE-U product line is undergoing testing to support wireless automation systems in factories and warehouses with positive initial results. Oil and gas verticals can also utilize the 5.8GHz LTE unlicensed frequency to quickly and easily connect work sites as the nature of these locations tends to make it difficult to maintain stable internet connections.

Learn More

LTE-U is now available at select distributors and resellers. If you would like to learn more about the LTE-U product line, please feel free to visit Baicells website at:

https://na.baicells.com/lte-u/

or contact our sales staff at sales_na@baicells.com.