Cable's 5G Backhaul & Small Cell Prospects & Challenges

EXECUTIVE SUMMARY

5G mobile is a big technology with a big challenge. In order to fulfill its promise of multi-Gigabit level mobile broadband, 5G requires an extensive backhaul delivery network and widespread distribution of small cell devices.

When smartphones came into being, cable companies provided cell tower backhaul and carved out a significant revenue-generating business by supporting 3G and 4G mobile. With 5G, things will be different. While cable is well positioned to support 5G, the technical challenges are greater, the business requirements are tougher, the regulatory hurdles are higher and the competition will be stiffer. Verizon, in particular, has signaled its intention to build out its own fiber backhaul network, while Crown Castle, the largest U.S. cell tower owner, has been acquiring fiber network companies.

Cable providers are experienced in using fiber for transport and they have the means to disperse small cells or other antennas indoors or outdoors. In addition, cable providers and suppliers are exploring the potential for other technologies to support 5G densification, including using DOCSIS 3.1 on hybrid-fiber coax (HFC), which is better suited to provide power for small cells than fiber.

Cable's 5G transport prospects are muddied because 5G's roadmap is unclear. 5G is a technology in flux, complicated by pre-5G technologies, such as LTE-Advanced Pro, stringent technical requirements, conflicting timelines and fiber infrastructure investment requirements that Deloitte estimates at $130 to $150 billion. Most cable providers are adding to the confusion because they won't disclose how many cell towers they serve, while tower owners reportedly exaggerate the number of towers they own.

Adding to the conundrum, fiber may be the transport of choice for backhaul, but cable's HFC plant is better suited to power small cells. Yet cable's potential usage of HFC-based D3.1 for backhaul raises a debate over whether it can meet 5G's tight latency requirements. Cable WiFi hotspots, CBRS and other technologies could play a role in 5G transport, but they need to be proven.

Still, experts say there will be plenty of transport needs to go around. The end game is to create a high-capacity mobile fronthaul, backhaul and local access network that can dynamically manage increasing traffic demands and seamlessly handle new applications. The current "dumb pipe" of mobile backhaul must be upgraded to support massive communications by individual enterprises and complex local access requirements at the network edge.

Cable's 5G Backhaul & Small Cell Prospects & Challenges identifies emerging service strategies for cable providers. Further, it covers backhaul background, as well as current opportunities and challenges in the market. In addition, this report identifies 12 technology suppliers that have signaled their interest in working with U.S. cable providers on mobile transport needs.

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Even before 5G, to get to LTE-A Pro – and for cable to meet related, more stringent SLA requirements with MNO customers – backhauls will have to be twice as fast as they are now and there will need to be tighter synchronization between towers, according to Accedian, which is helping MSOs to virtualize their testing and monitoring infrastructure. The following excerpt shows the primary differences between LTE-A Pro and 5G.

Excerpt: 5G & LTE-A Pro Comparison

Specifications	5G	LTE-Advanced Pro
3GPP Standard Release	3GPP Release 15 and beyond	3GPP Release 13 and beyond
Total Carrier Bandwidth	100 MHz carrier BW for gigabit backhaul and 500 MHz for multi-gigabit backhaul	640 MHz, aggregates up to 32 carriers each of 20 MHz bandwidth
Data Rate	About 10 Gbit/s	More than 3 Gbit/s
Latency	Less than 1 ms round trip time	Less than 2 ms round trip time and less than 1 ms one way delay
Backward Compatibility With Current LTE	Supported	Not supported
Control Plane	Same as LTE	Same as LTE
Frequency Spectrum	450 MHz to 6 GHz	3 to 6 GHz

Source: RF Wireless World

Cable's 5G Backhaul & Small Cell Prospects & Challenges is published in PDF format.