

2015 Predictions: Small cells set to move outdoors – backhaul pending – in 2015

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Article

January 14, 2015

Over the past few years there has been a lot of discussion about small cells – what they are and how and when they will fit into existing networks – as well as shared views on what challenges need to be met and the benefits operators can realize. Now, for the first time, analysts, industry pundits and operators all seem to be in agreement that the coming year will see small cells evolve from current indoor deployments and move to growing outdoor deployments. This is being driven as operators strive to meet growing mobile backhaul demands.

While it's likely that small cell deployments will first leverage fiber where it's available, technological advancements in wireless backhaul have made it a very viable solution that can also be tapped as needed. Because of this, we see the continued development and advancement of small cell wireless backhaul technologies that will evolve significantly in 2015. What's more, because operators will be forced to deal with the realities of putting outdoor small cell deployments in play, it's expected that the aesthetics of radio systems will need to be addressed in order to meet zoning challenges in the field.

Another area that will see activity is a trend toward backhaul and access integration in order to simplify small cell deployments. This year will also mark the beginnings of dynamic small cell networks, with auto-alignment, reconfigurability, auto-restore, path-searching and dynamic capacity features being necessary integrated components for deploying robust small cell networks quickly and efficiently.

Small cell backhaul: fragmented market in 2015

The coming year also will result in even wider confusion about how best to determine the most viable small cell backhaul solutions, because operators will be deploying a wide range of solutions and architectures. It's apparent that there is no clear trend pointing to a single solution; operators will make these choices after assessing spectrum availability and the operational, site and zoning aspects of individual deployments. As a result, expect to see a very fragmented small cell backhaul market in 2015 – one in which vendors will need to broaden and enhance the applicability of solutions in order to compete effectively in the emerging small cell market.

Some specific areas that will be impacted by an increased need for high-capacity LTE microwave-based macro cellular backhaul will be microwave equipment capable of delivering new modulations, multichannel support, bulk-compression technologies and wider frequency bands. But, because this will also tax available backhaul spectrum, operators will be driven to find ways to achieve the best spectral efficiency obtainable. E-band will also continue to be of interest as a solution, so expect to see it being much more broadly deployed for mobile backhaul in 2015. That is likely because it is now regulated globally and technological advancements have significantly increased e-band's reach, making it an option for operators to have a higher scale solution at a lower spectrum cost than traditional microwave.

This new year also will be the one for the first outdoor distributed antenna system or cloud radio access network deployments, which will be largely fiber-based initially with wireless fronthaul tapped as needed. This emerging market is thought to be valued at \$1 billion for fronthaul equipment vendors, and wireless fronthaul solutions are being viewed as a complement to optic-based fronthaul, rather than as a competitive solution. Expect to see wireless fronthaul solutions utilizing v-band and e-band microwave radio systems, which have been primarily used in validating field tests this past year.

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