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High-Band 5G: Let's Address the Range Question, Shall We?



JONESTOWN
 DAN JONES,
 Mobile Editor
 3/21/2017

In all the talk about accelerating 5G, testing 5G and getting 5G in the hands of a few lucky consumers in the next couple of years, there is one aspect of the next-generation wireless story that is still bugging me.

What is the range of millimeter wave (mmWave) high-bandwidth 5G, and how will that affect where and how the technology is actually deployed?

I ask because there appears to be several different takes on how mmWave 5G (typically 28Gz and 39GHz today) will arrive and -- hopefully -- thrive in the coming years.

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mmWave 5G, by the way, will nominally use frequencies between 30GHz and 300GHz (28GHz? Close enough apparently!) for wireless broadband communications and more. The advantage of using such high frequencies -- 2.5GHz is the loftiest band used for cellular in the US at the moment -- is that there is a *lot* of mmWave bandwidth available for new 5G services. It is also much easier to develop massive antenna arrays at a reasonable size with higher frequencies. (See [Sprint Gets Ready for Massive MIMO, Eyes 2.5GHz for 5G](#).)

There are trade-offs, however, because the signal penetration and range at 28GHz or higher gets shorter and more subject to line-of-sight and foliage concerns. (See [60GHz: A Frequency to Watch](#) for more.)

For instance, [Samsung Corp.](#) said recently that it tested its 28GHz infrastructure with [Verizon Communications Inc.](#) (NYSE: VZ) for its home-brewed fixed 5G service at ranges of up 1,500 feet (500 meters). If those ranges hold true beyond the customer trials -- note *if* -- that would mean a 5G radio deployed every couple of blocks in Manhattan, just for a fixed wireless service. (See [Verizon to Start Fixed 5G Customer Trials in April](#).)

Which has recently led me to wonder exactly how widespread mmWave 5G deployments will be? I asked the CTO of [Ericsson AB](#) (Nasdaq: ERIC), Ulf Edwaldsson, about exactly this in March at Mobile World Congress in Barcelona.

"We have never said they would be nationwide rollouts; that would surprise me a lot," Edwaldsson said. (See [Islands in the Stream: Don't Expect Full mmWave 5G Coverage in US, Says Nokia](#).)

Ericsson, remember, is one of the two companies -- along with Samsung -- doing customer trials with Verizon on fixed 5G. So this is going to be an important area to watch as it will help determine exactly how expensive and lengthy a process might be to deploy 5G. (See [5G Faces a Marathon, Not a Sprint](#).)

— Dan Jones, Mobile Editor, [Light Reading](#)

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kq4ym,
User Rank: Light Sabre
4/3/2017 | 4:59:06 PM

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Re: Officially it's a 2 km radius for Samsung 5G

Although the higher the frequency the smaller the antenna, makes making arrays pretty compact, they'll still need lots of them to cover an area and most likely increased installation and maintenance issues as well as possible interference problems due to the extremely short wavelengths.

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DanJones,
User Rank: Blogger
3/22/2017 | 10:28:33 PM

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Re: not so fast!!!
Yes.

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myboynick,
User Rank: Light Beer
3/22/2017 | 5:52:44 PM

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Re: not so fast!!!

did you know he was the keynote speaker at the Spectrum Frontiers workshop at the fcc last march? he's the numero uno expert in this field bar none.

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myboynick,
User Rank: Light Beer
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Re: not so fast!!!
call him.

https://en.wikipedia.org/wiki/Theodore_Rappaport

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mkanterman,
User Rank: Lightning
3/22/2017 | 5:15:12 PM

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Re: Officially it's a 2 km radius for Samsung 5G

Ericsson addressed coverage of 5G fixed wireless access using different spectrum bands and cell site placements in this white paper last year
<https://www.ericsson.com/publications/ericsson-technology-review/archive/2016/fixed-wireless-access-on-a-massive-scale-with-5g>

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User Rank: Blogger
3/22/2017 | 4:56:37 PM

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Re: Officially it's a 2 km radius for Samsung 5G

Which cities are getting condensed exactly? It's not a trend I've seen in NYC, London, San Francisco, Barcelona etc?

If an operator has deploy a 5G small every 500 meters to get coverage, how much does that cost for capex and opex? Don't forget they're going to have to rent pole or rooftop space and get permissions from local govt. The upfront cost of a small cell is not the total cost of ownership of a small cell, we've already seen that with 4G.

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- Systems integrators and consultants
- Vertical industries, such as carmakers

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User Rank: Blogger
3/22/2017 | 4:52:28 PM

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Re: Officially it's a 2 km radius for Samsung 5G

Well lets see if those numbers get wider in later testing cos 500m for fixed does not look super economical for deployment costs.

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Dan Jones,
User Rank: Blogger
3/22/2017 | 4:39:16 PM

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Re: not so fast!!!

Well, he's out of NYU in Brooklyn, so he's frequently in the NYC locale.

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myboynick,
User Rank: Light Beer
3/22/2017 | 4:08:46 PM

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Re: Officially it's a 2 km radius for Samsung 5G

condensed cities. small cells and beamforming negate line of sight issues.

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myboynick,
User Rank: Light Beer
3/22/2017 | 4:03:37 PM

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Re: not so fast!!!

you should be honored to ask him a question....he's the world's number 1 expert.

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