

# V and E Bands Key to the 5G Revolution

They offer an affordable, accessible way for smaller and rural providers to gain spectrum and deliver on the promises of 5G.

By David Sumi / *Siklu Communication*

Consumers today demand ever faster wireless. Although wireless engineers have multiple tricks up their sleeves to meet this demand, they can achieve only so much. To deliver the gigs customers crave, more spectrum is required.

The power of 5G wireless depends on the use of millimeter wave (mmWave) bands to deliver larger gigabit capacities. Some 5G deployments will be in the sub-6 GHz band, specifically the 3.65 GHz band in the United States with a total of 150 MHz of available spectrum, but the broadband industry is shifting its attention to frequencies of 24 GHz and more. These higher-frequency mmWave bands have GHz of spectrum available to generate gigabit connectivity and accommodate 5G services.

Initial focus has been on 24, 28 and 39 GHz, but because of the enormous number of internet of things (IoT) devices and new broadband services for homes and business connected via 5G networks, various industry players also are looking at the rich potential of bands far above that.

Licensed bands auctioned by the FCC are one way to gain more spectrum. But V band and E band offer a more affordable, accessible alternative for smaller and rural providers that may not have the big bucks to bid in the auctions.

## AUCTIONS FOR LICENSED BANDS

The FCC recently held auctions for 28 GHz and 24 GHz, with more auctions for 37, 39 and 47 GHz planned for the future. These higher-frequency mmWave bands hold great promise for delivering 5G, gigabit per second services. But the licensing auctions are expensive, so

they're usually dominated by large telcos and cable companies with deep pockets. For instance, Verizon has a large holding of 28 GHz licenses and is looking to add more.

Let's take a look at the current and projected FCC auctions.

- **Auction 101** – this covers spectrum in the 28 GHz band and offers two channels up for bid regionally, each 450 MHz wide. That's big, especially when compared to sub-6 GHz bands where even 100 MHz is difficult to obtain – with or without a license (5 GHz is a good example). See more: [www.fcc.gov/auction/101/factsheet](http://www.fcc.gov/auction/101/factsheet)
- **Auction 102** – The spectrum blocks in this band are limited to 100 MHz each in the 24 GHz frequency. There are a total of seven licenses available per region, each 100 MHz. See more: [www.fcc.gov/auction/102/factsheet](http://www.fcc.gov/auction/102/factsheet)
- **Upcoming auctions** – Timing for auctioning 37, 39 and 47 GHz bands has not been determined, but a total of 5 GHz may be auctioned.

Adding up the 1.6 GHz being auctioned right now and 5 GHz in the future results in 6.6 GHz of new spectrum – a massive amount by most standards. But remember, most of this will be gobbled up by entities with plenty of cash. Also, 6.6 GHz is a small amount compared with the 24 GHz of spectrum available right now, at minimal to no cost, to everyone.

## BEYOND LICENSED BANDS

Fortunately for consumers and carriers alike, licensed bands are not the only option for deploying high-speed wireless services. V band (60 GHz) and E band (70/80 GHz) are open to

all, with abundant spectrum available to deliver on the promises of 5G.

The 60 GHz V band, which is unlicensed, has 14 GHz of contiguous spectrum (57 GHz to 71 GHz). The 70/80 GHz paired E band adds another 10 GHz of spectrum for a total of 24 GHz. These V and E bands are open to everyone, and equipment for them is available today from a rich ecosystem of suppliers.

Carriers and wireless internet service providers (WISPs) are delivering gigabit services today to homes and businesses in the E and V bands, and hundreds of smart cities already have deployed E and V bands systems for video security, public Wi-Fi backhaul, municipal networks, and more.

Networks using these bands offer high capacity over short ranges, typically from 1,000 feet to 3 miles. Though this may seem limiting, mmWave has been deployed extensively not just in urban environments but in

rural communities as well. The need for 5G services is just as acute for municipal and business customers in a small town as it is in a big city.

The E and V bands will play significant roles in the industrial internet of things (IIoT), especially with video connectivity and virtual reality. All new and projected IIoT applications depend on 5G networking, and 5G is projected to produce more than \$12 trillion in global economic output by 2035, in part thanks to the impact of IIoT.

### GIGABITS FOR ALL

The FCC is a steward of a finite resource that is critical to the U.S. economy – the frequency bands all wireless devices need to operate. The FCC's job is to ensure that this resource is used for the greater good, and to ensure equal access to all. The very nature of this charter, however, can lead to a system that does not include everyone. For instance, small WISPs

typically are not players in licensed bands. Bands better serve us when they are used for nationwide deployments.

That does not mean the rest of the ecosystem, which comprises smaller regional telcos, service providers, smaller multiple system operators and municipalities focused on meeting the market demands, should be shut out – and indeed they are not. The 24 GHz of spectrum in the V and E bands dwarfs the total amount of spectrum available in all the licensed bands combined, and the depth and breadth of products operating in these bands continues to expand. The opportunity to partake in the 5G revolution – gigabits for all! – is here for the taking. ❖

*David Sumi is vice president of marketing at Siklu Communication, a provider of multigigabit wireless fiber connectivity. Learn more at [www.siklu.com](http://www.siklu.com).*

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