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Blog Post

## Why 5G Won't Follow the Typical Deployment Approach (and New Opportunities for Investors in Broadband)

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Mobile network infrastructure deployment in the U.S. has always followed a familiar path: three or four large equipment manufacturers struggle with each other to sell radios to three or four national carriers, which race to raise billions of dollars to buy spectrum and fund deployment. These investments get paid off over years as we all pay monthly bills (and overage fees) and buy new devices.

Many are expecting 5G to follow that well-trod route, and it likely will – at least in part. But innovations in spectrum licensing and network design are increasing the possibility that it will not be one or two carriers racing each other to create a nationwide 5G umbrella first. Instead, islands of 5G coverage built for enterprise and special-purpose use – think campus-wide networks for universities or hospitals or for a large manufacturing facility – may spring up as early as this year, beginning with the [June 25, 2020, auction 105](#) for the Citizens Broadband Radio Service ("CBRS") band. These individual network deployments may in turn accelerate 5G coverage – and lead to new investment opportunities.

### The CBRS Auction

The CBRS spectrum auction could be a game-changer. CBRS spectrum is capable of providing the bandwidth necessary for large-scale deployment of 5G but is currently used mostly for military radar installations. The other factor that will differentiate CBRS is the licensing scheme, which differs from previous spectrum auctions in two critical ways, both of which will create unique network opportunities for new players in the wireless space.

First, priority access licenses in the CBRS auction will be sold by county, a much smaller geographic unit than has been used in most other mobile spectrum auctions. This will allow individual licenses to be more affordable and better targeted to a particular community, campus or facility. CBRS licensees will also be able to partition and sublease their licenses, subject to “light-touch” rules from the Federal Communications Commission (“FCC”).

Second, the CBRS auction includes a novel licensing scheme that has been under development by the FCC and industry advocates for the past decade and is a departure from the “unlicensed or licensed” paradigm to which the industry has been accustomed since the early days of Wi-Fi and mobile data access. Previously, spectrum bands were either “licensed” and protected for commercial or government deployment or “unlicensed” and open for general public and unregistered use. The rules governing the CBRS band will enable the spectrum to be shared between commercial and government users for the first time. The CBRS band will include three tiers of access: an incumbent tier, for military radar installations and other federal users with legacy equipment in the band; a “priority access” tier, for those willing to purchase spectrum licenses in the upcoming auction 105; and a “general authorized access” tier, for those willing to deploy best-efforts networks that will utilize the spectrum much like an unlicensed band. Access to the spectrum among users in these various tiers will be managed by an automated database known as a [Spectrum Access System \(“SAS”\) controller](#). The SAS will determine whether an incumbent user is broadcasting, what priority a user should have, and how to resolve interference and conflicts.

The novel licensing scheme will allow licensed (mostly commercial or enterprise) networks to co-exist with unlicensed networks, offering interesting opportunities for sharing and interaction between different types of users with differing needs. For instance, the same spectrum could be used in a lightly traveled rural area to connect both agricultural or industrial equipment as well as the occasional commercial cellular customer. The ability for different networks to co-exist also avoids the need for spectrum clearing operations that would require government users to purchase new systems and migrate the operations into a different band (the cost of which would otherwise be allocated to purchasers of the spectrum in the form of guaranteed minimum reserves and/or delays before the spectrum can be utilized).

## Rise of Private LTE Networks

The CBRS auction is timed perfectly to coincide with the rise of private LTE networks – that is, campus or enterprise-scale deployment of network equipment to create

private mobile networks with the same security and robust capabilities of today's cellular networks. Instead of relying on a carrier to deploy enough equipment to guarantee good coverage on a campus or in a manufacturing facility, the owners of those facilities are purchasing small mobile networks of their own, deployed on their terms and with their own security and access rights, all able to connect to existing mobile networks. Replacing hundreds of Wi-Fi routers on a campus with a handful of private LTE nodes simplifies and hardens critical network infrastructure for organizations deploying private LTE networks.

These private LTE networks are being marketed as a solution to the enterprise Wi-Fi or campus Wi-Fi deployments that suffer from coverage gaps and interference (due to the lack of licensed spectrum) as well as security and privacy concerns. As wireless network access becomes an ever more critical piece of a company's infrastructure, many larger organizations' requirements have outpaced Wi-Fi's ability to meet their networking needs. And with the ever-growing list of devices and infrastructure needing network access – from building management systems to security systems to vehicles and robots – private LTE looks to be just the answer to Wi-Fi's weaknesses.

Network equipment providers are rushing to fill this gap with smaller-form-factor mobile-networks-in-a-box, creating solutions for hospitals, manufacturers, utilities and office parks. Although currently available equipment ships with 4G software, equipment providers will soon launch 5G-compatible products and 5G upgrade kits.

## The Opportunity: Putting 5G and Private LTE Networks Together

Any nationwide carrier's roll-out of a 5G network will take years to deploy. Localized, enterprise 5G networks operating on CBRS spectrum, however, could begin to appear this year. The combination of dedicated priority access to 5G-ready spectrum in the CBRS band and the inevitable availability of private 5G network equipment may combine at just the right moment, offering owners of distributed facilities a chance to buy and deploy their own 5G network well ahead of any planned nationwide carrier buildout.

If this comes to pass, it is not hard to imagine carriers working with these private network operators, offering to share spare capacity, federate their networks with the carrier networks and sign roaming agreements to add coverage to both the private and carrier networks at once. This model may in fact become the way that 5G gets built in the U.S. – not from the top down, but driven by users with specific needs, and rolled up

nationwide.

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