From Smart Highways to Connected Ports, 5G Promises Big Gains in 2020

The technology is slated to support a broad range of applications for business and government in the year ahead.

By Ingo Flomer / *Cobham Wireless*

In an increasingly connected world and with the number of connected devices skyrocketing, it's inevitable that major shifts will occur in the indoor coverage landscape.

For the past two years, 5G has been everyone's favorite topic. People are fascinated by when, where and how it will be deployed. They're definitely interested in the cost barriers and other challenges. Once the dust settled on the initial honeymoon period of 5G, however, it was evident that 2019 was going to be a year for LTE instead. There was a progression of LTE use cases in 2019, across public safety networks, transport connectivity hubs, and in-building coverage.

In contrast, 2020 is the year 5G may finally have its moment. The number of 5G indoor coverage systems being installed is expected to rise as a result of the increased number of consumer devices in circulation. 5G will also be the star of the new industrial internet of things (IIoT), owing to the enhanced capabilities it will offer to industries such as manufacturing and agriculture.

FirstNet deployment is ahead of schedule, and despite the challenges ahead, there are signs that more and more FirstNet-compliant hardware will be available. However, the industry still needs to find innovative ways to ensure that building owners adopt the technology while keeping costs down.

5G INDOOR COVERAGE WILL GATHER MOMENTUM

For many building owners, the financial incentive to create the kind of 5G user experience touted by the press is currently not available. Most people are happy today with the performance of phones, or don't really give it a second thought. This will change when 5G devices become more affordable and more widespread, and new 5G use cases are developed. But building owners will have to be ready.

In 2020, building owners will request that current wireless coverage systems be easily upgradeable to 5G. This offers the perfect, cost-effective solution. Venue owners and operators want longevity and ROI for purchases; what they *don't* want is to have to buy a whole new system in a year or two as demand for 5G in-building coverage grows.

From a technical standpoint, upgrading platforms to 5G will mean wider frequency bands, for example 400 MHz in band 3.5. I expect 3.5 GHz to be used in most indoor environments. This will not, however, increase coverage: 3.5 GHz is all about boosting capacity. Ethernet-based protocols will increase data transport efficiency, supporting the transport of more RF spectrum on the same digital bandwidth.

GROWTH OF IIOT WILL CREATE NEW MARKET OPPORTUNITIES

5G may not be gaining much ground with consumer users, but it is with heavy industry. Connecting manufacturing and processing plants, ports, mines, utilities and agricultural facilities will be a game changer, creating a new IIoT. In Germany, the IIoT known as Industry 4.0 was realized through a strategic alliance that aims to make the country a leader in advanced, intelligent smart manufacturing.

Cellular connectivity may have been enough for factories in 2019, but in 2020 and beyond, these buildings will require ultra-low-latency, high-reliability, machine-to-machine connectivity. China has made great strides in this area, thanks in part to its Made in China 2025 initiative. The Chinese government aims to make the country a manufacturing superpower via advanced technologies and high-end numerical control tools and robotics, which will deliver greater manufacturing efficiency.

Instead of needing mobile operators that historically have had a monopoly of the licensed spectrum market to deploy a connectivity system, business owners will have the option of going to other parties that have bid for and won licenses themselves. These could be companies that were traditionally specialists in software (such as Oracle) or engineering (such as Bosch). There soon will be a new breed of connectivity provider on the IIoT block.

Although IIoT businesses may be able to enter the telco space, few will have the industry experience and knowledge required to effectively design, deploy and operate a connectivity system. Many – especially small and medium-sized businesses – will also lack the financial resources to employ multiple parties to manage each stage of the deployment. Another gap will emerge in the market, which will be filled by providers able to offer a full, end-to-end service incorporating design, commissioning, radio and technical expertise, project management and operation. This is a fantastic new business opportunity, which provides a solution for less-experienced companies wanting to launch or scale an IIoT proposition. It also contributes to the development of the smart industrial market.

The IIoT offers strong ROI and unlocks new revenue streams in new and existing parts of the communications ecosystem. With financial incentives powering development and investment in this market, we'll see some interesting deployments and IIoT use cases next year.

DEPLOYING PUBLIC SAFETY COMMUNICATIONS

The upgrade of the public safety network in the United States is ahead of schedule, according to AT&T. Company CFO John Stephens says FirstNet reached 60 percent of buildout in June of 2019, nine months ahead of schedule. Stephens also hopes to complete the rollout before the end of the five-year contract – about two years from now.

More than 7,000 agencies have signed up for FirstNet, and AT&T boasts more than 600,000 FirstNet connections. If Stephens' optimistic forecast plays out, the network will cover even more states, and there will be more launches of FirstNet-compliant hardware, such as body-worn cameras for police officers. However, there are still challenges to overcome. The frequency used for public safety communications differs from state to state, so although the eventual goal is to move all services to Band 14 and FirstNet, the diverse requirements and lack of uniformity mean this process could take some time. In the meantime, Band 14 will be more of an addition to existing services than an all-out replacement.

To ensure that FirstNet coverage is deployed in-building, more building owners will look to deploy distributed antenna systems (DAS), which support multifrequency and multioperator coverage and can be upgraded to support FirstNet. Momentum around digital DAS deployments will also grow, as they allow building owners to quickly and easily upgrade and modify a system via software-based approaches. Again, this provides a cost-effective, future-proof solution.

RAILWAYS AND MOTORWAYS WILL SMARTEN UP AND DRIVE REVENUE OPPORTUNITIES

Transport is becoming a key focus of smart-city development, as roads and railways remain notorious "not-spots" for cellular communication. In 2018, Germany set an example in terms of connectivity, when telecoms regulator Bundesnetzagentur (BNetzA) announced its aim to ensure that all autobahns, federal highways and railways have 100 Mbps coverage from 5G services by the end of 2022. A similar move occurred in the U.K. recently, with operator EE announcing transport hubs as a major priority in its 5G network deployment plans.

Getting reliable 4G mobile coverage is still a challenge for commuters on many of the world's most popular rail routes, as well as in stations, but it needn't be such a hurdle. Solutions exist that can overcome the challenge of providing reliable voice and data coverage in stations and rail lines – an important part of passengers' experience.

There will come a time when blanket 5G coverage is needed, but to guarantee quality of service for consumers and support business and operator growth, adequate 4G mobile coverage is the necessity now. I expect to see more investment and further government announcements regarding smart railways and motorways through 2020.

CONNECTED PORTS: NAVIGATING A NEW MARITIME OPPORTUNITY WITH DAS

Increasing capacity and coverage in shipping ports is emerging as a means of unlocking new revenue opportunities and driving the smart city/IIoT agenda. When offshore, most ships collect and utilize massive amounts of data via satellite. When ships come into port, however, that data must be uploaded to parties onshore, before the ship arrives and before the cargo is unloaded. This could include data on the temperature and quality of cargo, for instance. ❖

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