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RAYCAP NEWS FOR MUNICIPALITIES

Raycap 5G mmWave Small Cell Deployment Update

Q1 2020

Raycap, a leader in 5G mmWave small cell concealment and telecom protection solutions, has taken the pulse of the wireless industry to see how U.S. municipalities are moving ahead with 5G wireless deployment in their jurisdictions.

Executive Summary

Recent media coverage documents the current state of municipalities and utilities as they strive to strike a balance between aesthetics and the ideal location for 5G mmWave small cell towers.

In parallel, municipalities are continuing to resist pressure from the FCC and major tier-1 carriers to speed up the pace of the 5G roll-out and localized small cell deployments.

Raycap brings you a recap of press coverage over the last six months that tells the story of how municipalities are approaching this seminal time in the development of wireless telecommunications networks in the U.S.

Residents generally accept 5G if it "blends in"

Aesthetics has emerged as a major point of contention for both city authorities and resident groups. Support has emerged from some sectors for 5G installations – as long as the small towers blend into the environment and retain the historic character of the neighborhood and surrounding buildings.

For instance, a report from Inside Towers on January 31, 2020 cited analysis by Axiom, which drew upon a study of 800+ residents by PWC. The research found that residents were overwhelmingly in favor of 5G small cell towers – due to the benefits of enhanced data download speeds and connectivity.

However, the same research found that consumers are opposed to small cell towers being installed in front of their own homes. Ironically, residents had no issue with the towers obscuring their neighbors' yards, however.

Residents' fears about small cell towers appearing in their own front yards were also captured in a report by Governing.com on February 11 that cited a lack of colocation as an issue. The author claimed this could lead to *"multiple pole installations in your front yard."* This indicates that some municipalities are not aware of the possibility to co-locate wireless facilities from different carriers in the same integrated pole.

The appearance of 5G small cell poles has come under increased scrutiny during debates and consultations between city authorities and resident groups. Indeed, one city council member in San Clemente, California, claimed they planned to vote against their installation because they are *"so damn ugly."*

Architectural and historic preservation is a key issue in many cases. For instance, in September 2019, the City of New Orleans was reported to be undecided about how to incorporate 5G small cell nodes in the city's historic French Quarter; with one proposal suggesting to conceal them within lamp posts.

You can conceal 5G mmWave radios

Raycap's InvisiWave® technology conceals 5G mmWave radios in light pole toppers, surrounds and traditional on-building concealments such as sconces or panels while minimizing loss of signal strength. Raycap's InvisiWave solution has been tested and approved for 5G mmWave frequencies and is fully backwards compatible with earlier technologies. Its smooth, hydrophobic surface stands up to environmental extremes and can be painted to match existing architecture. With InvisiWave, municipalities have the latitude to decide where and how to use concealment, streamlining the deployment of 5G mmWave networks while maintaining control over the urban aesthetic environment.

Municipalities are rolling out their 5G guidelines and regulations

Municipalities are beginning to adopt their own localized 5G policies, despite the 2018 FCC order that, in theory, means local governments have little power to stop small cell installations.

However, the order does allow municipalities to adopt policies that set aesthetic regulations. To illustrate how some local councils are embracing this, Government Technology reported how officials in Winchester, Massachusetts, were seeking to implement a policy that would regulate small cell facilities for 5G wireless services in town. According to Winchester Town Manager Lisa Wong *"the aesthetic regulations could address many issues like color, placement on the poles, concealment of cables and wires, landscaping requirements and more."*

There are conditions attached, however. For instance, the FCC order prohibits municipalities from denying a small cell site installation based on health or environmental concerns Wong commented that the regulations it imposes *"have to be objective and reasonable and cannot be more burdensome than those applied to other types of infrastructure deployments."*

Some city councils have gone even further and published specific guidelines on the distance between individual small cell installations. For instance, Inside Towers reported how the San Clemente City Council voted on Tuesday, February 4, 2020, to introduce an ordinance that will establish regulations and guidelines for proposed small cells within city limits. The ordinance would restrict telecommunications companies from placing small cells within 500 feet of a school or a residence — which renders nearly all of the public rights-of-way as off-limits — as well as 300 feet from another cell site.

Meanwhile, local authorities, such as the City of Virginia Beach, Virginia, have released very detailed design guidelines for small cell infrastructure. Inside Towers reported how the three key points were summarized as (1) new poles cannot be placed within 20 feet of mature trees; (2) historic buildings are not appropriate host sites; and (3) wherever possible, small cells are encouraged to co-locate.

Municipalities are pushing back against FCC requirements, and carriers aren't afraid to sue right back

Carriers haven't been afraid to challenge municipalities in court, with Verizon filing a case against the city of Rochester, New York, over an ordinance that would allow the city to charge as much as $1,500 in fees for the use of the public right-of-way.

Elsewhere, municipalities, such as Seattle and Bellevue in Washington State, have continued to express opposition to the 2018 FCC's requirement that cities charge 5G providers a set fee of no more than $270 per utility pole attachment.

Aside from utility pole fees, much of the opposition has centered around the FCC's 2018 order that prohibits municipalities from denying a small cell site installation based on health or environmental concerns.

For instance, a U.S. Court of Appeals hearing was initiated on February 10, 2020, in a case brought forward by a collection of cities, counties and power company's opposed to the FCC's 2018 Wireless Infrastructure Order.

Existing street poles are seen as viable sites, but there are concerns

As indicated above, current street furniture such as lamp posts and existing utility poles have been identified by some municipalities as the ideal home for 5G small cell wireless facilities.

For instance, authorities in Northwest Arkansas indicated they would prefer equipment installations on existing poles or easements along roadways. This emerged after concerns were expressed about the potential for new small cell poles to interfere with traffic signals or cause blind spots for drivers.

However, utilities such as Xcel and Southern Company have raised concerns about the viability of installing small cell transmitters within existing street poles, specifically their structural stability and the associated risk of street lights falling over.

Integrated poles are the backbone of 5G mmWave deployment

A new generation of small cell street poles meet 5G mmWave small cell requirements and support municipality efforts to build a smart and attractive city. These "integrated poles" combine and conceal all the electronics needed for 5G mmWave wireless networks as well as accommodate lighting, monitoring and other functions. They arrive at the installation site with cabling, radios, and power/fiber equipment pre-installed and pre-tested. All that is needed for installation is to set the pole on the foundation, then hook up the feed lines for power and fiber.

The "Big 3" carriers roll out 5G network expansion plans

In the last six months, the major carriers in the U.S. have revealed more details about their planned 5G deployments in 2020.

At the start of the year, the merger between T-Mobile and Sprint received the green light to move forward. This followed an unsuccessful case by several state attorney generals who sought to block the deal.

The decision clears the way for T-Mobile and Sprint to merge, which will impact their efforts to expand 5G coverage. Right now, T-Mobile has the largest 5G footprint of any U.S. carrier, covering 5,000 cities and 200 million people. However, that network is built on low-band spectrum, which is only slightly faster than LTE. However, T-Mobile does use faster millimeter wave technology in parts of seven cities and is looking for a way to boost speeds.

On January 31, Verizon announced that its 5G Ultra Wideband mobility service is available in 34 U.S. cities with seven 5G-enabled devices and 17 NFL Stadiums. This followed the publication in November of the carrier's first detailed, street-level maps illustrating its 5G coverage areas. Light Reading predicted that because Verizon is using millimeter-wave (mmWave) spectrum for its Ultra Wideband 5G rollout, it will need to install thousands, or perhaps even millions, of small cell transmitters every few hundred feet in order to blanket a major city like Los Angeles with 5G coverage.

The potential health effect of EMF radiation remains a concern for resident groups

Some city councils have been influenced to adjust small cell ordinances and siting regulations by community groups concerned about the health implications of 5G – in particular the potential risk of high-frequency electromagnetic field (EMF) exposure.

In the same article from February 14th, Governing.com highlighted the contrast between earlier cellular networks – that use low frequency waves - and 5G networks that use high frequency waves, which scientists have indicated are less hazardous as they cannot penetrate the skin.

In fact, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) has updated its guidelines for the protection of humans exposed to radiofrequency electromagnetic fields which conclude that, even at millimeter wave frequencies, 5G in its current form poses no additional risk to health.

However, an earlier report on Governing.com claimed that medical doctors from 42 countries have appealed to the UN and European Commission asking for a moratorium on the rollout of 5G until the hazards associated with exposure to EMF radiation are verified definitively.

Meanwhile, in 2019, New Hampshire became the first U.S state to commission a study on the health effects of 5G.

Meanwhile, Fierce Wireless reported that the telecoms analyst firm Opensignal claimed to know what locations will get AT&T's low-band 5G coverage next, based on cities where the carrier has already retired some of its 4G spectrum to repurpose for 5G.

In its analysis of the 155 markets of top 200 Cellular Market Areas where AT&T has licensed 850 MHz spectrum, Opensignal observed that starting in November AT&T turned off 10 MHz of that spectrum in a number of markets where it had been in use for 4G, and subsequently launched low-band 5G in those cities in December.

What's more, AT&T stated in January that its 5G service is now available in parts of 35 cities. This followed reports in October that AT&T planned to rollout nationwide low band 600 MHz 5G coverage across the whole of the U.S. in 2020. The carrier recently conducted a trial at a retail outlet in Waco, Texas, where it claimed to observe wireless speeds of approximately 1.2 Gbps in a 400 MHz channel and RAN latency rates at 9-12 milliseconds.

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About Raycap

Raycap is an international manufacturer and technology leader with decades of experience providing innovative infrastructure solutions for customers in the telecom, energy, defense, transportation, and other industrial markets. Its solutions protect mission-critical applications and ensure the best possible system availability. The company's product portfolio includes lightning and surge protection technologies, structured cabling and connectivity solutions, power management systems, custom enclosures, cabinets, and wireless network concealments. Since its founding in 1987, the company has experienced continuous growth. Its engineering expertise, extensive patents and IP, test laboratories, and multiple manufacturing facilities guarantee quality, reliability, and innovation. Product design, testing, and approval processes comply with all international safety standards. Raycap operates in the United States, Germany, Greece, Cyprus, Slovenia, and Romania.

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