

RAYCAP ARTICLE

5G Installation in Tampa Airport Demonstrates Next Generation of Indoor Wireless

Large venues are looking to augment indoor wireless installations with 5G mmWave services in crowded areas. Custom enclosures are necessary to meet aesthetics and safety criteria and ensure performance for multiple carriers. Raycap's fast design, engineering, and manufacturing cycles met aggressive contractor rollout schedules at Tampa Airport.



Tampa International Airport

Large Venue Projects Upgrade to 5G mmWave

While much of the focus on 5G mmWave deployment has been on outdoor installations on streets and rooftops, there has also been increasing interest on adding these services inside venues that cater to large numbers of the public. Airports, convention centers, arenas and other areas are looking to offer 5G services to improve customer experience and enable new services—both consumer and business, and even Internet of Things (IoT)—in their spaces.

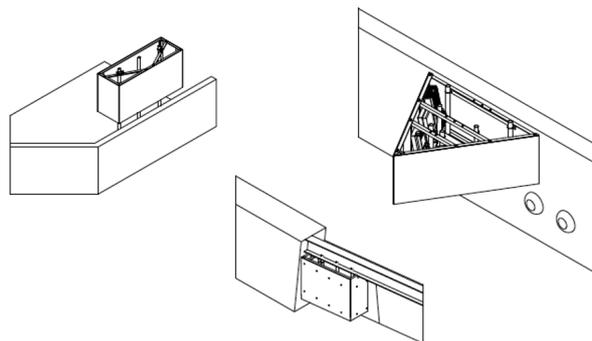
Installing 5G small cells indoors has different tradeoffs than outdoor deployments. On the one hand, the environment is more controlled, so there is much less temperature variation and little chance of power surges due to lightning strikes or other phenomena. When mounted outside on a pole, in contrast, the engineering design needs to consider weight and wind shear.

On the other hand, indoor installations must operate in enclosed, carefully designed spaces, and may be closer to the public and businesses that they serve. Designing the site to blend in seamlessly with its surroundings is a higher priority. Also, maintenance personnel (for the 5G service and general building upkeep) are likely to get closer to the 5G radios more often than if they were mounted on the exterior of a building. Special consideration is necessary to minimize up-close exposure to the mmWave signals coming from 5G antennas.

Raycap recently completed the design and manufacturing of enclosures used to deploy 5G mmWave services at the Tampa airport. This project is a good example of how the airport, the wireless service contractor and Raycap collaborated to meet the equipment and aesthetic requirements of adding 5G services discretely, safely and on a tight schedule.

Deploying 5G inside Tampa Airport

Given its experience in custom enclosures and concealment for 5G mmWave, Raycap was engaged by a wireless tower contractor to help engineer and manufacture 5G radio enclosures within the airport. The project included nine sites within the airport to cover highly trafficked areas, including concourses, flight gates and food courts. To provide optimal line of sight for the wireless signal, the nine locations are all overhead: eight on top of other structures and the ninth suspended from the ceiling.



The enclosures were designed to blend in with airport architecture and, using Raycap's InvisiWave® material, conceal the 5G wireless equipment.

Each enclosure contains a multi-tenant 5G small cell site which supports three tier-1 carriers. The rectangular enclosures are customized to each individual location—on top of structures or mounted on walls—to provide maximum coverage. The triangular enclosure is suspended from the ceiling: the three sides provide 360° signal coverage.



Adding 5G mmWave service improves the user experience for travelers and businesses in the Tampa Airport.

Each Enclosure Customized To Its Location

Understanding the location and coverage requirements for each site, Raycap worked with the contractor to customize the enclosures for each location. The engineering designs include location, mounting and cabling for the radios, in addition to the sides of the enclosure. Raycap was able to turn around the drawings for the nine locations in a matter of days to facilitate engineering review with the contractor and aesthetic reviews by the airport. Raycap also created a series of photo simulations for review by the necessary parties.

The sides of the enclosures are fabricated with InvisiWave, Raycap's patent-pending 5G mmWave material which minimizes loss of signal strength at higher GHz frequencies. Fully tested and approved for use at mmWave frequencies



The enclosures are designed and engineered to fit seamlessly into highly trafficked areas such as food courts.

commonly used for 5G networks, InvisiWave is backwards compatible with technologies that use lower frequencies such as C-band and 4G LTE. Its smooth, hydrophobic surface can be painted to match any existing architecture—including the interior of Tampa Airport.

Engineering Collaboration For Safety

During the design process, an additional requirement was added to ensure safety for maintenance personnel. The small cell sites will need occasional maintenance by trained technicians, while other building personnel may also come near them for general upkeep. The contractor asked Raycap for a solution to ensure that all personnel coming near the locations take appropriate precautions when near the mmWave antennas.

While Raycap's manufacturing facility in North Charleston, SC was managing the review process, engineers in the Raycap Post Falls, ID location engineered, built and tested a proximity sensor application that would be integrated into the enclosures. This circuit would identify any person coming within a specified distance to any one location and light up an alert light to let them know to take precautions if they got any closer. This seamless collaboration between Raycap's engineering teams across the country kept the project on track, even as new features were added.

5G IS THE NEXT GENERATION OF WIRELESS FOR INDOOR VENUES

Many large facilities like the Tampa Airport have provided cellular phone service for some time by providing access for commercial carriers, installing their private 4G macrocells or distributed antenna system (DAS) installations. With the promise of 5G bandwidth exciting travelers and businesses, many of them are ready to upgrade. Fortunately, this typically means adding 5G small cells to only those areas where travelers congregate, such as concourses and food courts. The new 5G services then work alongside existing wireless services, improving cellular performance in the areas where travelers are most likely to use it, while maintaining current service levels in other areas. Raycap understands the engineering challenges and opportunities of adding 5G mmWave in venues like airports, convention centers and arenas—talk to us about your next 5G installation.

InvisiWave®

Rapid Manufacturing And Delivery

With multi-tenant 5G small cell sites, a contractor's revenue doesn't begin to flow until the tenants' services go live. Internal coordination between Raycap's engineering and manufacturing teams provided streamlined production, and manufacturing started immediately at our North Charleston facility. All of the custom enclosures, with custom proximity sensors added, were completed and shipped to the contractor in Tampa in about six weeks.



Collaboration among the contractor, airport and Raycap ensured that each location met engineering, aesthetics and safety criteria.

The success of this project lies primarily in the ongoing collaboration between the contractor, airport and multiple teams within Raycap. It shows how deploying 5G mmWave services within a venue like an airport requires careful engineering, aesthetics and safety considerations particular to each space the services will work within. Once the enclosures are approved, they have to be built and delivered quickly to help the contractor meet its project goals.

Contact Raycap today to discuss how we can help deploy 5G services within your venue.

Contact us today at info@raycap.com

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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