

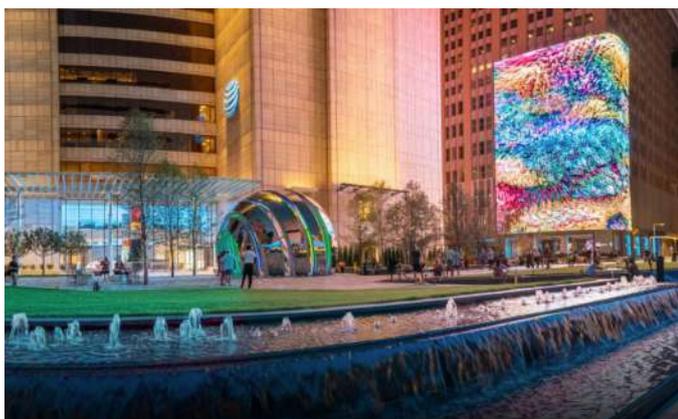
RAYCAP CASE STUDY

Keeping Innovation Connected with 5G in the AT&T Discovery District

*To see the range of solutions for concealing small cell wireless sites, look no farther than Dallas, Texas. Working to provide technology solutions for AT&T in its corporate headquarters city, Raycap completed two very different small cell concealment projects that show how collaboration among stakeholders and experienced engineering can solve challenging wireless deployments: making 5G sites nearly invisible in the AT&T Discovery District and combining elegant design and engineering in small cell streetlight poles a few blocks away.*

**Celebration Of Innovation Relies On MmWave 5G**

High-speed mmWave radios provide the ultimate in bandwidth for 5G services. When AT&T introduced plans for their Discovery District in downtown Dallas more than two years ago, mmWave 5G services for connectivity were a central feature, along with entertainment venues, dining and sustainability innovations such as smart irrigation and rainwater harvesting system, zero waste onsite recycling and composting.



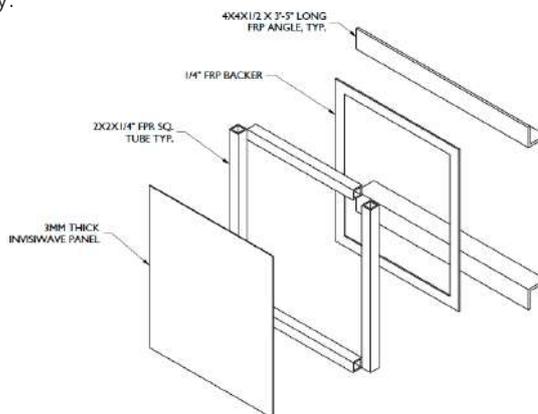
AT&T Discovery District in Dallas, TX. Photo credit: AT&T <https://discoverydistrict.att.com/about/>

The District has become a celebration of innovation in the heart of downtown Dallas, with AT&T inviting visitors to “Explore new ways to dine, new ways to play, and new ways to connect.” Being a top-tier carrier, AT&T wanted to get the 5G service right.

The limited signal range of mmWave 5G radios means that service needs to be maintained by a collection of small cell sites around the district. In dense urban areas, small cell sites need to satisfy a range of criteria from carriers (or tower companies), landowners, cities and utilities. Meeting performance objectives as well as a municipality’s aesthetic requirements can be difficult. In this case, AT&T also wanted the small cell sites to blend seamlessly with its own corporate headquarter architecture. Raycap was one of the vendors brought in to provide concealment solutions that ensure 5G mmWave performance while keeping radios out of sight of the public.

**Concealment Structures Blend In To Building Walls**

Raycap’s portion of the project required six custom-designed wall-mounted boxes to provide 5G coverage around the four-square-block District. Once the sites were identified, Raycap played a central role in collaborating with city and building engineers to get their 5G small cell site designs approved, using its proprietary InvisiWave® concealment material. The InvisiWave material exhibits nearly zero dB loss for wireless signals ranging from sub 6 GHz frequencies all the way up to 100 GHz, including the ranges for AT&T’s mmWave radios. The wide frequency range makes InvisiWave sites backward compatible as well as future-proof with maximum signal quality.



Raycap’s InvisiWave material does not degrade 5G mmWave signals and can be painted to match any surface. Can you spot the 5G small cell site in this photo

Working with AT&T, Raycap engaged the building manager to work through power and connectivity challenges for mounting on the sides of the building, as well as an approach to meet the look of its exterior. The building is sheathed in granite slabs, so Raycap had to accurately locate the crawl-space areas behind each small cell box as well as the precise locations for holes for cabling: you don't want to have to cut granite more than once. In addition, the dimensions of the boxes needed to align with seams in the granite walls to help them appear part of the structure.

Raycap produced initial photosim renderings of the boxes for aesthetic review by the building owner and city engineer. With those approvals, Raycap produced preliminary engineering drawings for review by the carrier's engineers and the building management. Finally, Raycap led the final engineering stage to ensure the boxes met all the criteria for AT&T, EIA/TIA and the city of Dallas. The entire engineering process took about four months.

After manufacturing the boxes in its Charleston, S.C. facility, Raycap worked with a local contractor to oversee the installation of the box panels. To closely match the unique patterns in the building's granite surfaces, Raycap employed a local artist to hand paint them to match each specific location.

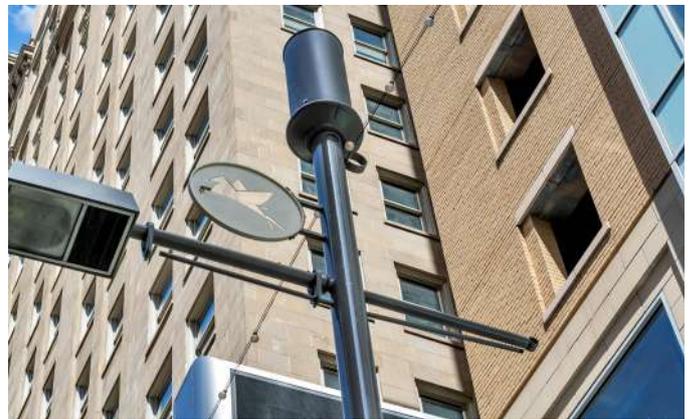


*Working with the carrier, building owner and city of Dallas, Raycap designed and engineered concealed small cell sites such as this one (hint: it's across from the second-floor landing).*



## Plus, The City's First Customized Small Cell Poles

Near the District, Raycap designed and manufactured small cell poles that further demonstrate the ability to customize installations to match precise aesthetic demands.



These new poles had to match existing architectural cues in the area around the District, such as very specific fluting and decorative bands. One unique design challenge was an integrated Pegasus design, a distinctive symbol of Dallas since the days when the city was home to Mobile Oil Company. The poles also included two light arms (facing the street and sidewalk) as well as connections for stringing up banners. The surface of the poles had to be finished according to city color requirements.

In addition to the design features, Raycap accommodated a number of engineering requests. For example, the city required a lockable access panel in the base of the pole for installation of possible future equipment such as WiFi or video systems. AT&T wanted the design to accommodate upgrades to 5G radios. At the same time, the local electrical utility wanted a power meter inside the pole, with the meter's face flush mounted. The power and fiber connections had to be accommodated from under the street in the base of the pole.

With design and engineering decisions made, Raycap did a thermal analysis of the pole to make sure the radios and electronics would not be affected by the Texas heat. Raycap then added a number of fans to the pole's design to ensure good thermal performance. The poles were fabricated at the Charleston, S.C. facility and delivered on time for installation by the contractor partner.

## Meeting The Varying Needs For Concealed Small Cells

The “Pegasus poles” and the concealed sites on the AT&T Discovery District represent two very different sets of criteria, engineering and installation. In both cases, Raycap approached the challenges by understanding customer requirements, engineering solutions that meet a range of stakeholders, fast manufacturing and delivery, and expert support. Contact Raycap to talk about the unique needs of your small cell deployments.



Contact us today at [info@raycap.com](mailto:info@raycap.com)

## About Raycap

Raycap is a solutions provider and manufacturer of telecommunications infrastructure products for mobile and broadband networks with customers and operations throughout Europe and North America. The company has a large installed base including active & passive cabinets, connectivity and lightning protection solutions and RF concealments. Our STEALTH® Concealment Solutions feature custom, freestanding and attached structures that enable carriers to rollout next generation wireless network infrastructure. Raycap has a dedicated team of sales, engineering, and customer support professionals that make the needs of the customer the number one priority. As a known and trusted vendor for Tier-1, Tier-2 & Tier-3 carriers, Raycap products can be found in a wide variety of telecom sites with more than 400,000 site installations across North America alone.

Raycap has the experience, technology and reputation for understanding customer needs and delivering the right products on-time for smooth product installation.

# Raycap

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