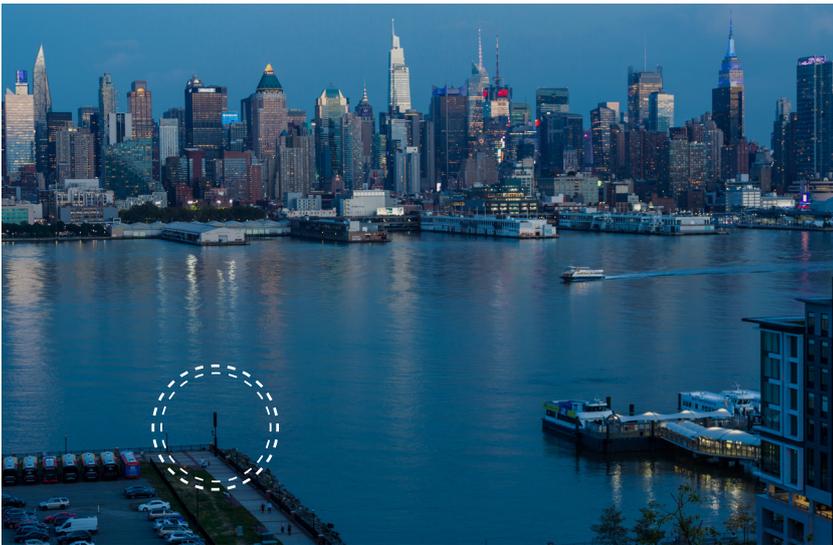


## Raycap And Integrator Partner Deliver Multi-Carrier Integrated Small Cell Poles Along A New Jersey Riverfront

*When a top-tier integration company needed help meeting wide ranging requirements for one-design-fits-all, small cell poles, they called on Raycap's engineering expertise. Starting with dimensions, designs from the city, and location constraints from the partner, Raycap's engineers configured all the electronics and radios inside the pole designs for 4G and 5G service. Together, Raycap and the integrator saw the process through to completion, and the poles now provide 5G service along a very busy area in New Jersey by the Hudson River.*



### Adding Multi-Carrier Poles Into High-Traffic Areas

This project started when a build-to-suit, neutral-host integrator contacted Raycap to help with engineering and manufacturing of integrated small cell poles. Working on behalf of a tier-one carrier, the integrator had identified a specific set of locations for the poles. Each of the sites needed to be one-design-fits-all. New Jersey has planning and zoning requirements that encourage colocation of wireless providers to help reduce the total number of wireless sites that would need to be installed in any given area. In fact, some New Jersey cities provide incentives to the neutral-host companies to make sites work for various carriers often allowing them to be "fast-tracked" through the zoning and permitting processes.

This collection of sites is in Weehawken, along a high-traffic corridor that follows the northeastern coastline of New Jersey along the Hudson River. The area is seeing increasing development as New-York-based firms move to the New Jersey side of the river, a migration which also stimulates additional commercial and residential development.

In this busy area, achieving coverage is challenging and typically relies on roof-top sites. In fact, Raycap has worked with several wireless customers to engineer and manufacture roof-top sites for this purpose. Yet rooftop installations are sometimes not sufficient for wireless carriers when rolling out 5G services that need to be located closer to mobile users.

In urban areas like this, integrated small cell poles are the best alternative to achieve the coverage and densification

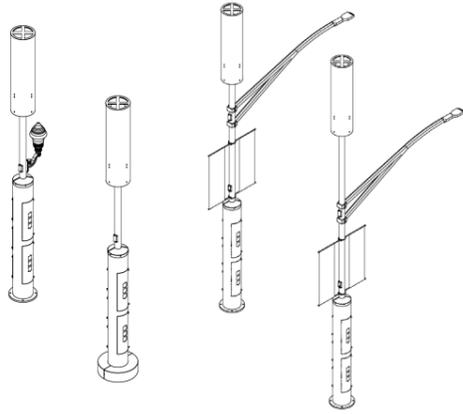
to guarantee high-bandwidth 5G service. From the city's perspective, the poles should be as unobtrusive as possible, since they are squarely in the public right-of-way.

### Raycap Had To Engineer And Future-Proof The Poles

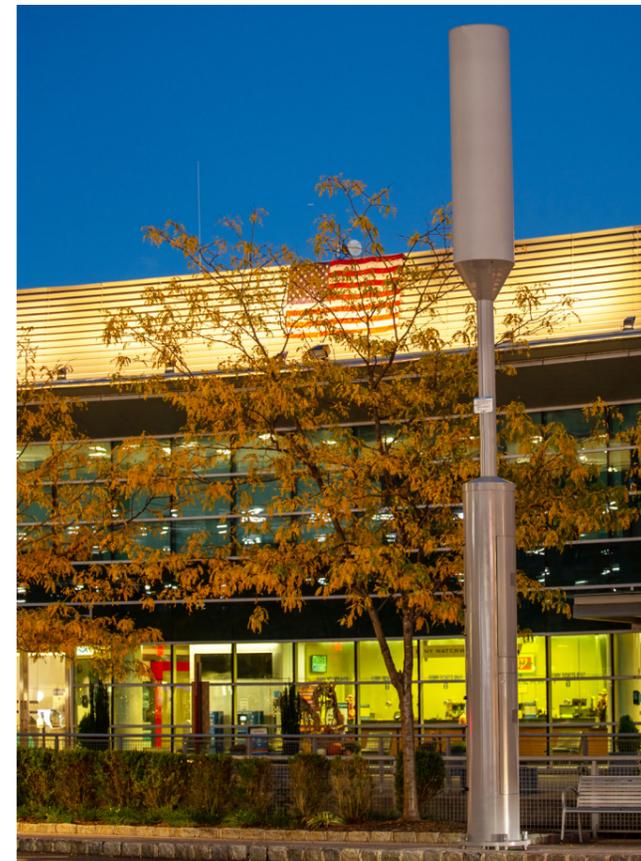
In this application, the interior pole design had to accommodate previous, current and future technologies and spectrums, such as 4G LTE and 5G. Retrofitting needed to be built in. Having made the investment in the sites, the integrator can't afford to discover that they can't accommodate new technologies for their carrier clients a few years later. As a result, this Raycap design had to anticipate a range of equipment and sizes from different carriers into the space. Fortunately, having worked with a wide range of carriers and neutral-host integrators, Raycap has a great understanding of the requirements of different radio OEMs.

For the external format, the City of Weehawken has standardized on specific poles. Two designs have traffic lights for illumination along roads. Another design uses an acorn luminaire for ambient light away from roadways. A fourth has no light for locations with sufficient ambient light, that need to be more inconspicuous. For each of these styles, Weehawken's Department of Transportation guidelines require a 20-inch maximum diameter for the base to avoid blocking line of sight for drivers. The mid-pole has a much narrower diameter, and the top of the pole has a defined space for radios and antennas.

Once an engineering design succeeds in meeting integrator, carrier and city requirements, the interior of the pole may be quite dense with electronics and radio equipment. To help make future retrofits easier in this case, Raycap organized the doors, racks and cabling in a way to remain accessible for maintenance and upgrades. The company also performed a thermal analysis to make sure there would be adequate airflow to keep interior temperature within limits during New Jersey's hot muggy summers. These steps were straightforward for the Raycap team who have years of experience with designing integrated concealed poles.



Weehawken decided on four standardized pole styles with and without lighting and banner arms to suit the aesthetics of the area.



## Meeting The Needs Of All Stakeholders

The location of the poles themselves also presented a challenge for the project. In this very dense stretch of development, the poles needed to be installed close to the road. On the other side of the poles are stone walking paths, with a sewer running along the far side of the paths. The city and the integrator did not want to have to tear up too much of the sidewalk given these constraints. Yet the utilities all ran underground.

The integrator's engineers worked with the city on specifications, locating the utilities and documenting the physical constraints. After filing the paperwork and permitting, they turned to the Raycap engineers to complete the engineering drawings of the base design and installation details. The integrator then reviewed the drawings to ensure compatibility with different carrier equipment needs.

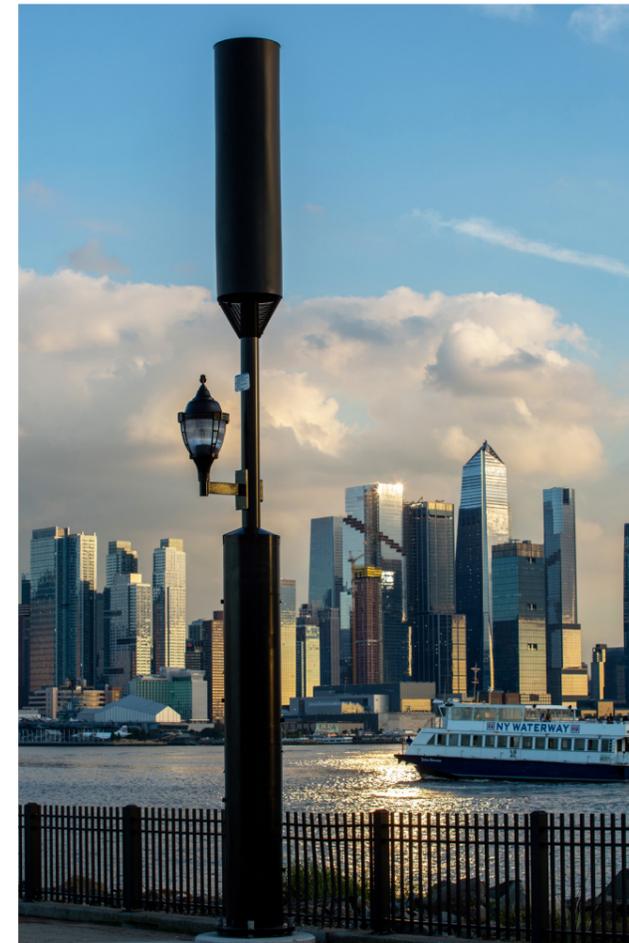


The effort started with Raycap preparing concept drawings for design review by a range of stakeholders: local architectural review boards, community interests, the city, and the local utility company. Raycap reflected their input and revised the drawings during the long planning and zoning process. The integrator then completed the necessary final reviews with the city and utility. The end result were integrated pole designs that satisfied the needs of all parties.

All this had to conclude successfully within a specific timeline for zoning reviews and permitting—completing all this engineering work in a timely manner is critical when working with city departments that are often swamped with requests from contractors and integrators.

## Now Delivering 5G Service On The Hudson

With the designs approved, Raycap manufactured the poles and delivered them to the integrator for installation. Today, they are up and running and providing 5G service to this busy area along the Hudson River. This project demonstrates how Raycap can apply a wide range of engineering and practical experience to the design and manufacturing of integrated small cells, no matter how complicated the assignment is.



Contact us today at [info@raycap.com](mailto:info@raycap.com). Visit our website for more case studies on successful 5G small cell installations and other useful information. [www.raycap.com/streamline-your-rollout](http://www.raycap.com/streamline-your-rollout)

## 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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