



## Small Cell FAQs

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### What is a small cell?

A small cell is just like the name implies. A small cell augments Verizon's capacity in a given area. It consists of a radio, antenna, power and a fiber connection. Small cells are short range mobile cell sites used to complement larger macro cells (or cell towers). Small cells enable the Verizon network team to strategically add capacity to high traffic areas.

### Why small cells?

Demand for wireless data services has nearly doubled over the last year, and is expected to grow 650% between 2013 and 2018 according to Cisco. It's part of Verizon's network strategy to provide reliable service and to stay ahead of this booming demand for wireless data.

Small cell networks add capacity in small specific areas to improve in-building coverage, voice quality, reliability, and data speeds for local residents, businesses, first responders and visitors using the Verizon Wireless network.

### How does it work?

A small cell uses small radios and a single antenna placed on existing utility poles, transit poles, street lights, signs and signal light poles. The coverage area can range from a few hundred feet to upwards of 1,000 ft. depending on topography, capacity needs, and more. This small focused footprint supports 4G LTE-enabled devices, allowing more consumers to do things like stream video or share photos on social media during events.

### Where has Verizon deployed small cells?

Verizon first began adding small cells in late 2013 across the country to meet community needs.

### Are small cells the same as a distributed antenna system (DAS)?

Like a DAS, small cells are connected by fiber to a centralized base station. Small cells complement distributed antenna systems that allow for the availability of robust 4G LTE coverage to customers in challenging coverage areas, like basements of public buildings or large stadiums.

### Do small cells / oDAS replace the need for macro sites?

For Verizon, small cells are part of a balanced approach to network capacity. Verizon will continue to add traditional macro cell sites, expand its 4G XLTE footprint for bandwidth and capacity, and will keep investing in the things that keep its network running, even during times of disaster – battery back-up, generators, mobile cell sites, and more. Small cells are typically designed to cover a very small area to enhance capacity. Traditional macro sites are still necessary to cover larger areas. Typically it would require at least 9 small cell / oDAS sites to fill the space of a macro site while still having significant gaps between each small cell location.

**Where will Verizon add small cells?**

Verizon looks to add small cells in areas ranging from urban centers to residential communities where there is a need for extra capacity to serve customers to stay ahead of the demand for wireless data.

**Are small cells subject to the same regulation as a traditional/macro cell site?**

The approval process for small cells varies from jurisdiction to jurisdiction. Verizon works hand-in-hand with each local jurisdiction on small cells placement including right-of-way regulations and more.

**Are small cells safe?**

The Federal Communications Commission (FCC) requires compliance with its Radio Frequency (RF) emissions safety limits to ensure the safe operation of cellular facilities. Verizon fully complies with all standards and operates well within the safety guidelines set by the FCC. Additionally, we work with local jurisdictions to ensure all applicable federal, state and local regulations are followed. In general, due to their small size, low wattage and limited coverage, emissions from small cells are a small fraction of FCC-permitted levels in any publicly accessible area.

**Are small cells reviewed for compliance with FCC safety guidelines?**

Yes. All small cells must comply with the same stringent standards by which macro communications sites are reviewed and regulated.

**Has there been enough review of the millimeter wave technologies (i.e. 28 GHz and 39 GHz frequencies) to be putting these so close to homes?**

All Verizon facilities are required to comply with Federal Communications Commission (FCC) safety standards. Verizon is committed to maintaining compliant facilities and has implemented a comprehensive compliance program in which we regularly check facilities for compliance. This technology is reviewed by health and safety organizations worldwide to ensure safety, and operates well within the safety guidelines set by the FCC.

The FCC, in consultation with numerous other federal agencies, including the Environmental Protection Agency, the Food and Drug Administration and the Occupational Safety and Health Administration, has developed safety standards designed to ensure that wireless communications networks and equipment operate within safe levels. The standards were developed by expert scientists and engineers after extensive reviews of the scientific literature related to radio frequency (RF) biological effects. The FCC explains that its standards “incorporate prudent margins of safety.” The FCC provides information about the safety of RF emissions from cellular base stations on its website at: <http://www.fcc.gov/oet/rfsafety/rf-faqs.html>. In general, due to their small size, low power wattage and limited coverage, RF emissions from small cells are a small fraction of FCC-permitted levels in any publicly-accessible area.