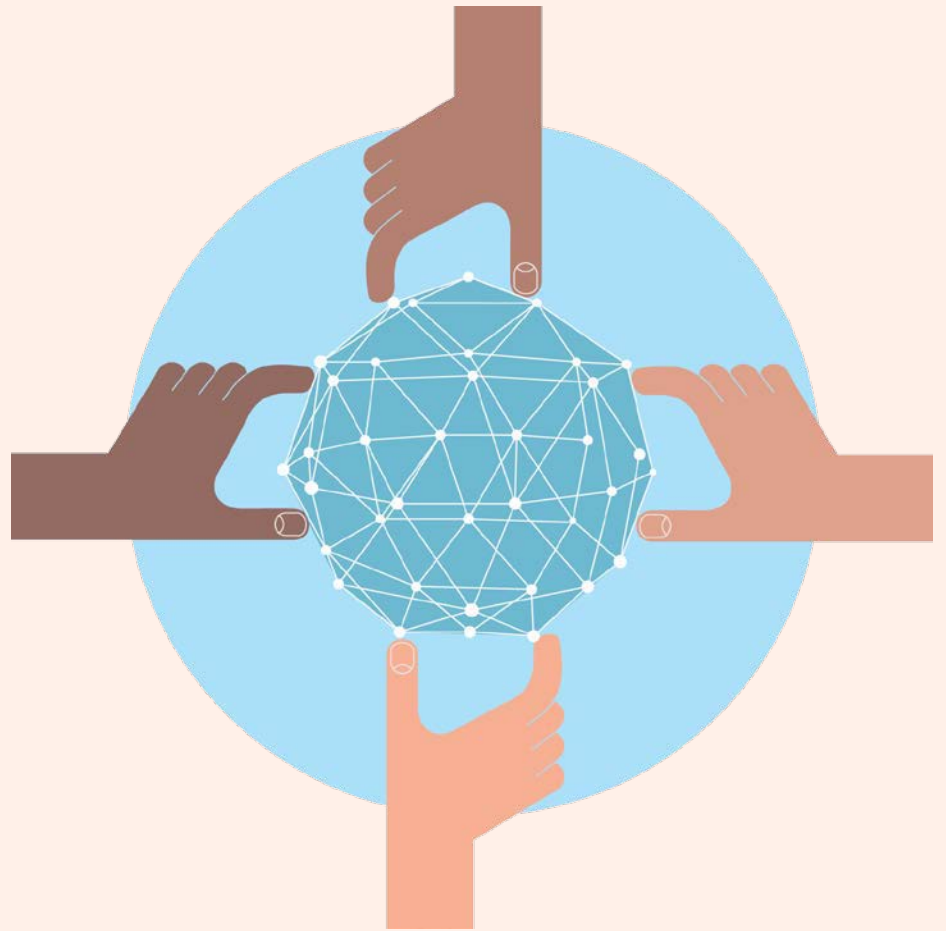


**Connecting  
our homes,  
businesses  
and  
communities.**

**verizon<sup>v</sup>**



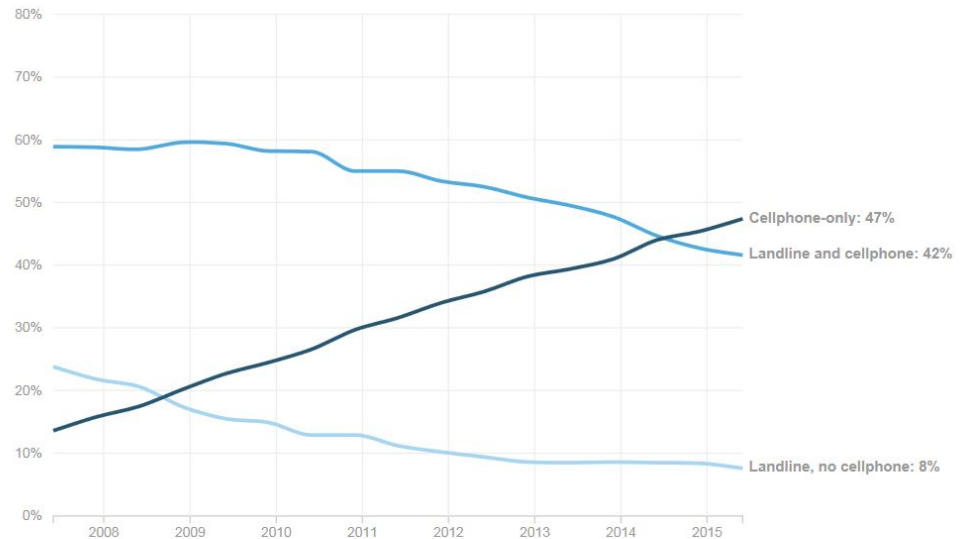
# Wireless- Only Households



Today, just over half (50.8 percent) of American households only have a mobile voice connection. For Millennials (those born between 1982 and 2004), the number increases to over two-thirds who live in mobile-only households. That number is another significant jump up from 10.5% in 2006 and 31.6% in 2011.

## The Rise Of The Cellphone-Only Household

Share of households, by type of phone



Source: CDC/NCHS, National Health Interview Survey

Credit: Alyson Hurt and Alina Selyukh/NPR

# Smart Cities and The IOT



Wireless-powered smart city solutions could produce \$160 billion in benefits and savings from lower energy use, reduced traffic congestion, and decreased fuel costs.

Connected devices could create \$305 billion in annual savings for the healthcare industry.

Self-driving cars could save 21,700 lives and \$447 billion per year.

The number of IoT devices worldwide will conservatively surpass 20 billion by the year 2020, and this increase in connectivity stands to add roughly \$2.7 trillion to U.S. GDP by 2030.

# Building a wireless network you can rely on in a crisis.

The reliability of your cell phone is never more important than when crisis strikes. That's when a simple call or text message can make the difference between life and death.

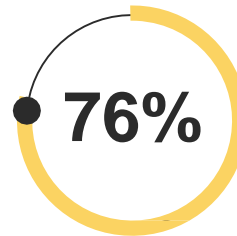


We build reliability into every aspect of our wireless network to keep customers connected when you need it most.

Reliability starts when we choose the safest, most secure locations available for our wireless equipment. The likelihood of earthquakes, and risk from wildfires, mudslides, floods, hurricanes and more are all considered.

When disaster strikes, we coordinate with first responders and can mobilize charging stations, special equipment, emergency vehicles and more to support local, state and federal agencies in all 50 states.

**It's who we are.**



of wireless subscribers have used devices in an emergency.<sup>1</sup>

of all 911 calls are made from wireless devices.<sup>2</sup>

1. Wireless Week, March 9, 2016  
2. National Highway Traffic Administration, February, 2016

# Wireless facilities and property values.

Cell service in and around the home has emerged as a critical factor in home-buying decisions.



National studies demonstrate that most home buyers value good cell service over many other factors including school district when purchasing a home.

75%

More than 75% of prospective home buyers said a good cellular connection was important to them.<sup>1</sup>

83%

The same study showed that 83% of Millennials (those born between 1982 and 2004) said cell service was the most important factor in purchasing a home.

90%

90% of U.S. households use wireless service. Citizens need access to 911 and reverse 911 and wireless may be their only connection.<sup>2</sup>

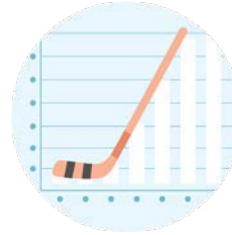
1. Money, "The Surprising Thing Home Buyers Care About More than Schools," June 2, 2015  
2. CTIA Facts and Infographics, June 2015

# Why are we expanding the wireless network?

More people than ever before rely on wireless connections to manage their lives and businesses.

Verizon is expanding its wireless network to meet the growing demands of today and tomorrow.

But it takes time.



U.S. mobile data usage is projected to grow nearly seven-fold through 2019.<sup>1</sup>



There are now more wireless devices than Americans, with about 1.2 devices for every person in the country.<sup>2</sup>



In North America, the average household has 13 connected devices with smartphones outnumbering tablets 6 to 1.<sup>3</sup>

1. Cisco VNI Mobile Forecast Highlights, 2014 – 2019, October 2015

2. 2017 CTIA Wireless Snapshot, May 2017 & Pew Research Center, "Mobile Fact Sheet" (Jan. 12, 2017), available at <http://www.pewinternet.org/fact-sheet/mobile/>

3. HS Market Connected Device Market Monitor: Q1 2016, June 7, 2016

# Health and safety background.

**Health and safety organizations worldwide have studied potential health effects of RF emissions for decades, and studies continue.**

According to the FCC, measurements made near typical cellular and PCS installations, especially those with tower-mounted antennas, have shown that ground-level power densities are hundreds to thousands of times less than the FCC's limits for safe exposure.

The Federal Communications Commission (FCC) guidelines for operating wireless networks are based on the recommendations of federal health and safety agencies including:

- The Environmental Protection Agency (EPA)
- The Food and Drug Administration (FDA)
- The National Institute for Occupational Safety and Health (NIOSH)
- The Occupational Safety and Health Administration (OSHA)
- The Institute of Electrical and Electronics Engineers (IEEE)
- The National Council on Radiation Protection and Measurements (NCRP)

Wireless technology, equipment and network operations are highly regulated.

**More information can be found through these organizations:**

**Federal Communications Commission Radio Frequency Safety Program:**

[http://wireless.fcc.gov/siting/FCC\\_LSGAC\\_RF\\_Guide.pdf](http://wireless.fcc.gov/siting/FCC_LSGAC_RF_Guide.pdf)

<http://www.fcc.gov/oet/rfsafety/>

**Food & Drug Administration “Cell phone facts”:**

<http://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/HomeBusinessandEntertainment/CellPhones/ucm116282.htm>

**World Health Organization:**

<http://www.who.int/peh-emf/publications/facts/fs304/en/>

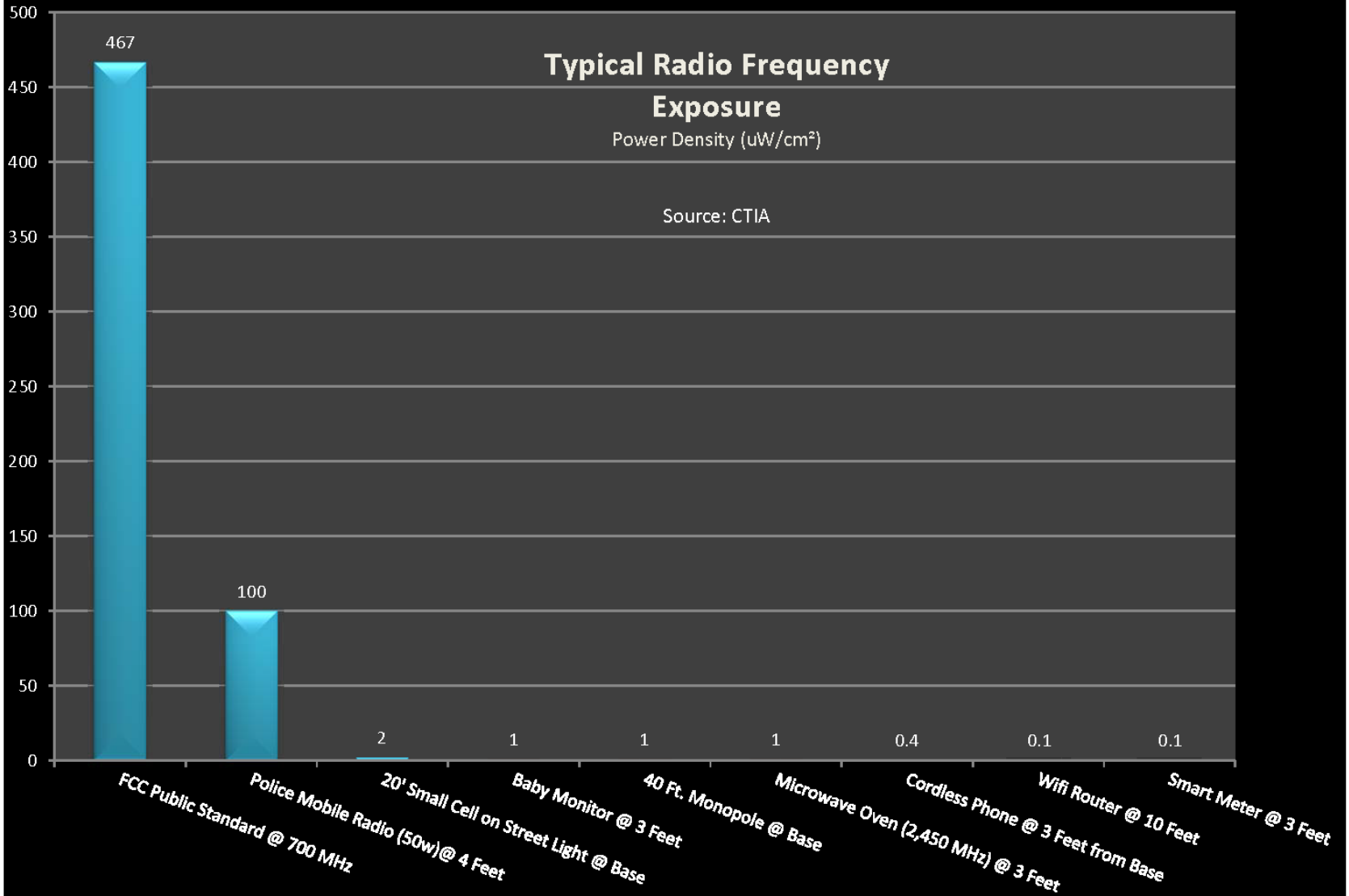
**American Cancer Society**

<http://www.cancer.org/cancer/cancercauses/othercarcinogens/athome/cellular-phone-towers>

# Typical Radio Frequency Exposure

Power Density ( $\mu\text{W}/\text{cm}^2$ )

Source: CTIA





# Staying ahead of demand.

A wireless network is like a highway system...



More wireless traffic needs more wireless facilities just like more vehicle traffic needs more lanes.

- Many wireless users share each cell site and congestion may result when too many try to use it at the same time.
- Wireless coverage may already exist in an area, but with data usage growth increasing exponentially each year, more capacity is needed.
- To meet capacity demands, we need to add more wireless antennas closer to users and closer to other cell sites to provide the reliable service customers have come to expect from Verizon.

Wireless subscribers used almost 10 trillion megabytes of data in 2015, more than double what they consumed in 2014.\*

\*Fortune, May 23, 2016.

# Finding the right location.

To meet customer needs and expectations, wireless providers need the ability to expand and enhance their networks where users live, work, travel and play.



Verizon gathers information from many sources including customer feedback, results of our own exhaustive network testing, and data from third parties.

When an area for improvement is identified, utilizing our existing network is always our first effort. If that is not possible, we then look at adding a new site.

## Steps to finding a new site

Our engineers analyze the areas that need improvement to figure out the ideal location based on customer needs, terrain and modeling results.

Using existing structures is considered first.

Network teams perform exhaustive searches in the area needing improvement to find a location that will meet our technical needs. We also look at interest from property owners.

We pick a location that has the highest likelihood of meeting technical needs and works for the community.

## Guidelines for new sites

We comply fully with all requirements for community notification and review, zoning and permitting.

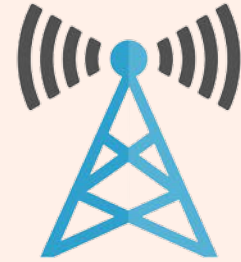
Potential antenna locations must meet all local, state and federal regulations.

Verizon holds Federal Communications Commission (FCC) licenses for the frequencies utilized and we strictly follow their regulations.

# Different locations require different solutions.

Verizon uses a balanced approach to engineering the best possible network given the local community's needs.

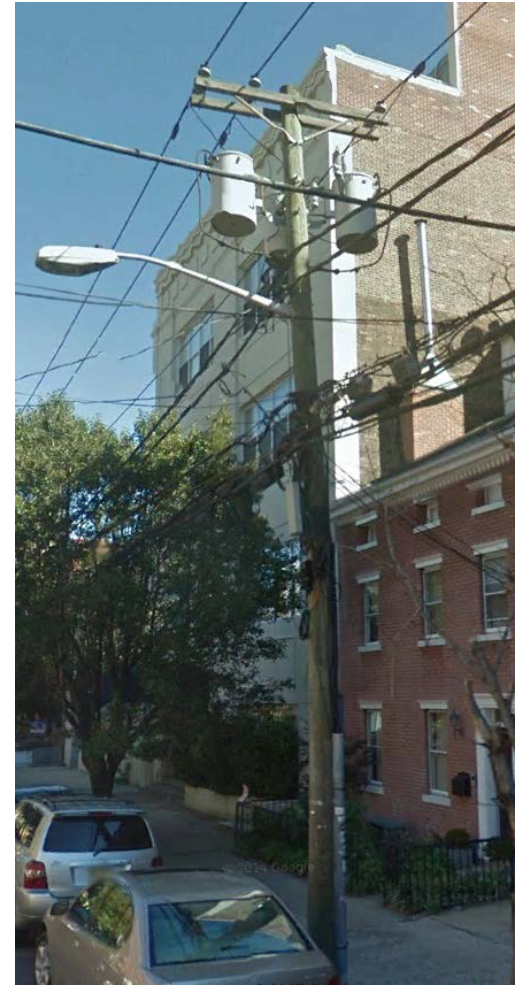
Macro sites are traditional cell sites or towers that provide capacity and coverage to a broad area, up to several miles.



Small cells are just like the name implies – short range cell sites used to complement macro cell towers in a smaller geographic area ranging from a few hundred feet to upwards of 1,000 feet. These lower power installations enhance capacity and provide coverage in areas where there are gaps in reliable wireless service.

Distributed Antenna Systems (DAS) are a group of antennas in outdoor or indoor locations that connect to a base station. DAS systems are typically used in and around large venues including stadiums and shopping centers.

# Poles Verizon Wireless Can't Use



**Equipment configurations vary depending on utility pole owner.**

**Verizon Telephone, ACE and PSE&G allow the radio equipment box to be mounted on the pole.**

**JCP&L requires radio equipment to be placed on the ground 8-15 feet from the pole.**

**Installation on Existing JCP&L Pole**



**Installation on New Verizon Telephone pole or Existing Verizon Telephone/PSE&G/ACE pole**



# Replacement Lights

Replacement light fixtures are custom designed to match existing infrastructure and blend in with the streetscape.

Verizon will work with municipalities on siting and to come up with a mutually agreeable design.



# What Verizon Wireless is Requesting from Communities in New Jersey

A provision of the New Jersey Public Utility Act, N.J.S.A. 48:3-18 permits any company (not necessarily public utilities) to use poles that have been lawfully erected in the public right-of-way.

Where the second company is not itself a franchised utility, which is the case with Verizon Wireless, the consent of the municipality is required under N.J.S.A. 48:3-19.

This is only the first level of permission sought by Verizon Wireless. After consent from the governing body is obtained, Verizon Wireless will then seek site specific permission from the appropriate building departments.

**Thank you.**