ctia™

The State of Wireless

2018

Introduction

Welcome to CTIA's 2018 State of Wireless report, a comprehensive look at the key facts and figures that tell the story of America's wireless industry.

It's a remarkable story—one of American ingenuity, innovation, and investment combining to create a world-leading wireless ecosystem that powers the U.S. economy.

It's also a story of human connections: the phone calls, the text messages, and the video chats. Wherever you are, wireless keeps you connected to the important people in your life.

Wireless continues to improve every day. Mobile speeds are faster than ever. Coverage continues to expand, even in challenging-to-serve rural areas. Mobile devices pack more power and capabilities. All the while, fierce competition drives prices down.

This year, our story is also one of change. Thanks to our industry's investment in technology—and the people that power it—we'll see the first 5G networks by the end of 2018. America's wireless industry moves fast. It's a momentous development.

With 4G, the wireless industry connected everyone. As we look to next-generation 5G networks, we're connecting everything.

You can see that in the growing number of cell sites and data-only devices this year, as well as in the number of consumers and businesses looking to wireless to transform our communities and our economy.

But as the transition to 5G begins, other countries are doing everything they can to seize our global leadership—and the associated economic benefits.

While America's wireless industry is leading the way on 5G efforts, policymakers must act during this critical inflection point to reform local zoning rules, unlock more spectrum, and create conditions that will speed nationwide deployment.

America's Wireless Industry

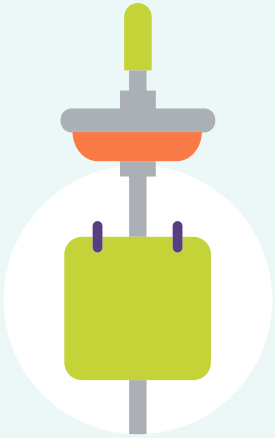
A Story of Remarkable Growth and Transformation

Since 1985, CTIA has tracked the evolution of the U.S. wireless industry with our wireless industry survey. During this time, we've seen remarkable growth and significant changes as we moved from analog voice to high-speed mobile connectivity.

This year is no exception as the wireless industry continues to grow and set new records for network traffic, wireless connections, and network infrastructure deployment.

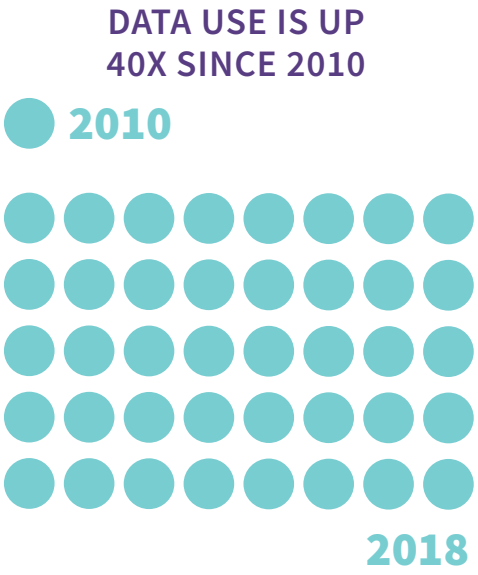
Indeed, this year's report shows the industry on the cusp of another transformation. The mobile and fixed 5G services launching in 2018 will build upon the 4G efforts and network densification that the U.S. wireless industry has undertaken in the past few years—setting the foundation for our 5G future.

Let's dive into the numbers.

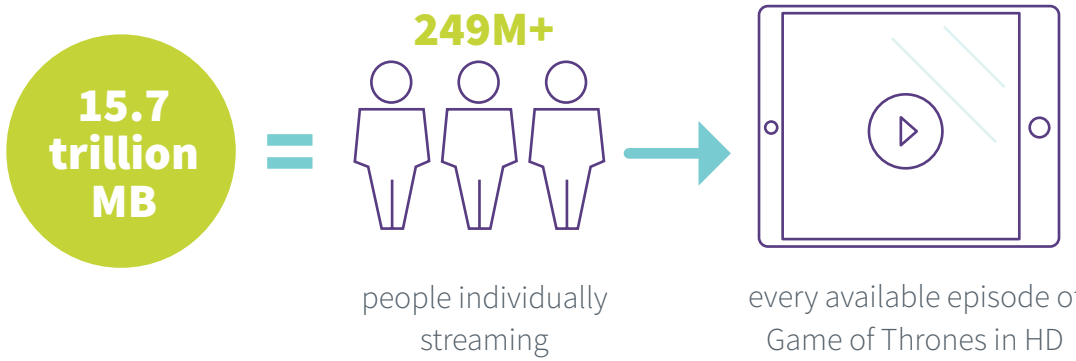


Wireless data use in the U.S. continues to soar.

Year over year, data use has trended up as Americans embrace the power of wireless connectivity. In just the last year, we saw an additional **2 trillion MB cross our networks.**



Consumers set another record year for wireless data use in 2017 as demand for everything wireless continues to grow. We saw **over 15 trillion MB** carried over U.S. wireless networks last year, which is another annual record.



SMARTPHONE ECOSYSTEM

400M+

mobile devices, that's about

1.2 devices
for every person in the country

of those devices,

273M

are data-intensive smartphones

that's equal to **82%** of the U.S. population

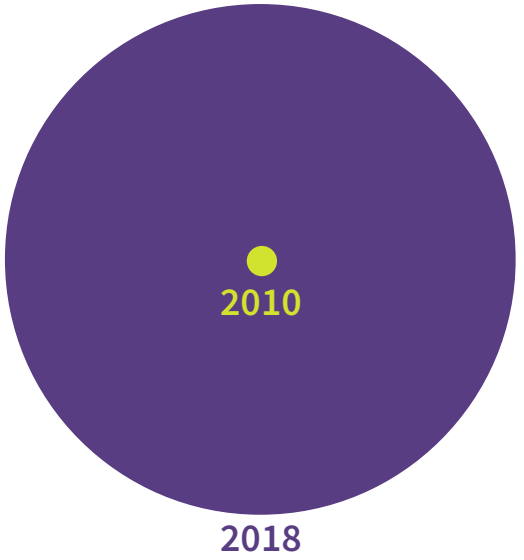
Up 56%
over the last ten years

Driving this growth is a decades-long and continuing increase in the number of mobile devices. With over 400 million mobile devices, there are more wireless devices than Americans—in fact, about 1.2 devices for every person in the country.

More than 68% of these devices are data-intensive smartphones. On average last year, a smartphone generated more than 5 GB of data every month. This represents a 2,844% increase since 2010 as networks have become faster, phones have become more sophisticated, and new services and apps have launched.

5GB

of data generated by a smartphone each month



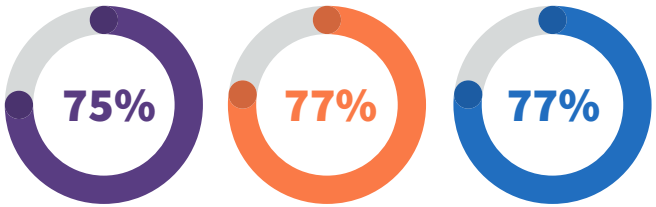
+2,844%
more data since 2010

Smartphone adoption is up across all demographics, well on its way to becoming ubiquitous and reflecting our mobile-first lives.

Millennials lead smartphone adoption. In the U.S., smartphones are owned by:[1]

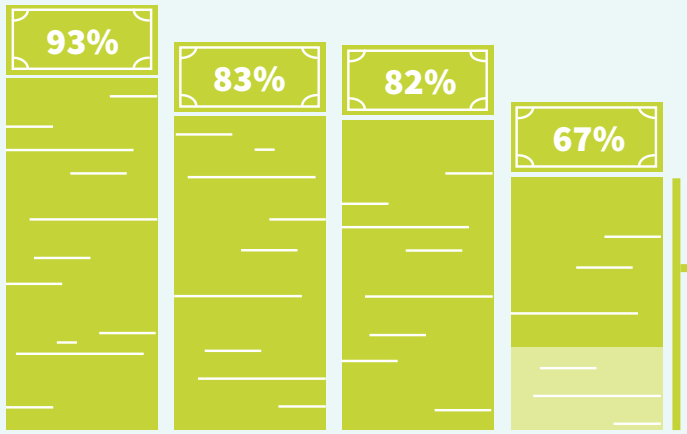
of 18–29 year olds | of 30–49 year olds | of 50–64 year olds

With respect to race, smartphone ownership cuts across the board, including:[1]



of African-Americans | of Hispanics | of whites

Across income levels, a significant majority of Americans now have smartphones:[2]

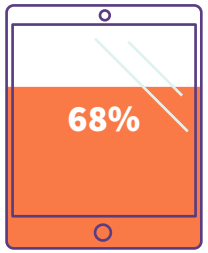


ANNUAL EARNINGS

Since 2011, the percentage of adults making under $30,000 per year who own a smartphone has tripled, growing from 22% to 67%.[3]

We're using wireless more—and relying on mobile connectivity in more ways.

We first used mobile phones to make calls on the go, then came text messaging for quick messages, photos, and videos. Today, Americans are using their wireless devices for even more.[4]



68% of Americans are doing more with their mobile service now than they were five years ago, including:

- Mobile banking
- Health apps
- Browsing the web
- Shopping
- Finding entertainment
- Connecting with their car and home
- And more

American businesses rely on wireless more than ever, viewing this connectivity as a strategic resource for their companies and employees.

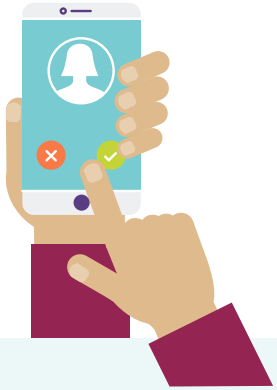
of executives view wireless technology as important to their business today[5]

Even as consumers and businesses adopt new applications and view wireless in new ways, text/SMS/MMS and voice calls continue to be of great importance to how we communicate.

The equivalent of 56,000 messages every second of an entire year

Consumers exchanged
1.77 trillion messages
(combined SMS and MMS) in 2017.

Consumers also spent
2.2 trillion minutes
talking on their mobile devices through traditional voice services.

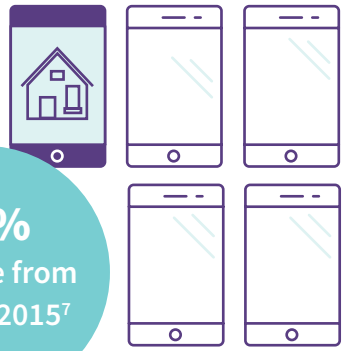


More people are cutting the cord and going wireless-only, making mobile their sole telephone connection. Over half of U.S. households rely only on mobile for their voice connection.

52.5%

of American households have only a mobile voice connection[6]

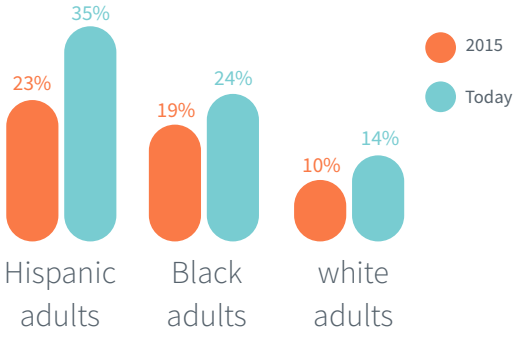
Americans are also increasingly relying entirely on mobile wireless at home. **One in five now rely only on their smartphone for home Internet access.**



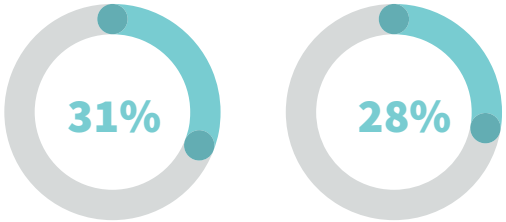
54%
increase from 13% in 2015[7]

This trend is particularly true among Hispanics, African-Americans, young adults, and low-income individuals.

Own smartphones but don't have a wired home broadband connection[8]



Do not have a wired home broadband connection but do have a smartphone[9]

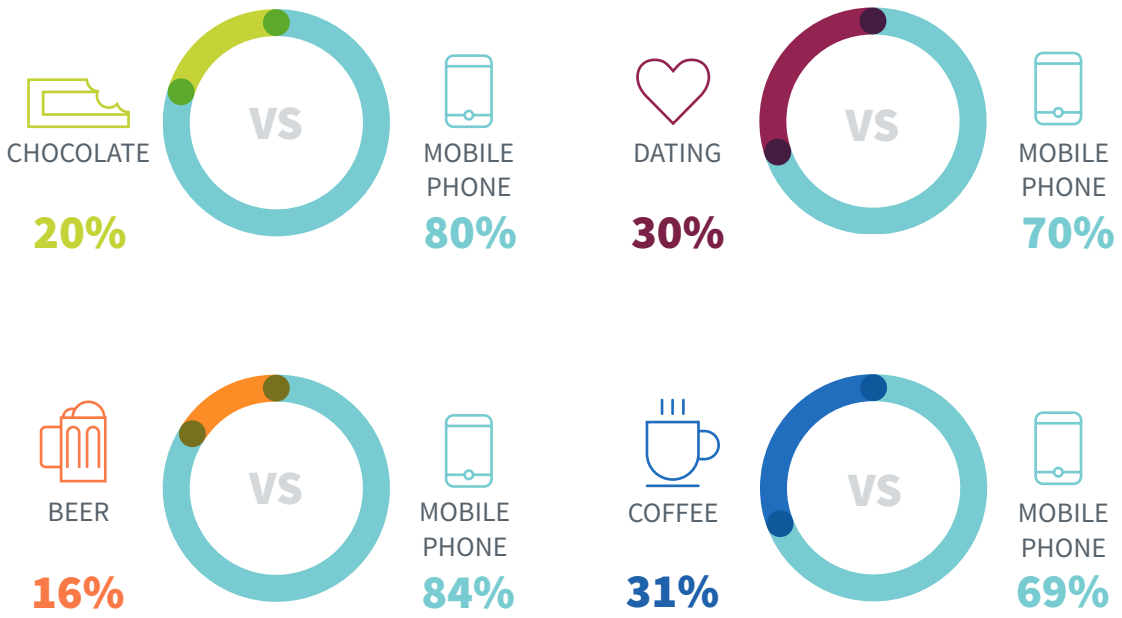


of adults making under $30k per year

of adults aged 18–29

Just how important has mobile become to us? More and more Americans are saying they would choose their mobile phone over other popular products or activities.[10]

GIVEN THE CHOICE, AMERICANS WOULD CHOOSE:



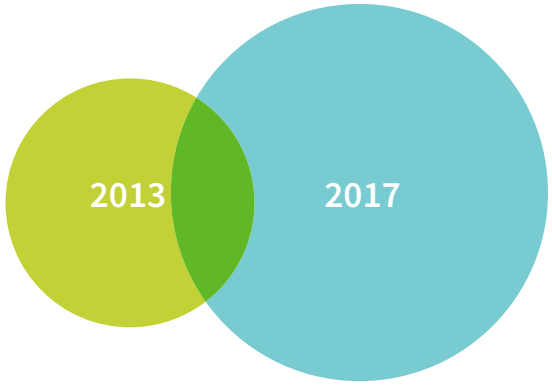
Not just a phone anymore—wireless connectivity is evolving.

This is the year that 5G networks will begin to be deployed. And for the first time, we're capturing signs of a shift from the 4G era to the 5G era.

While we continue to see growth in our traditional industry metrics, we're starting to see—for the first time—indicators that show us moving from an industry that connects *everyone* to an industry that connects *everything*. One of these indicators is the strong growth in the number of data-only devices.

The number of non-phone connected devices reached 126.4 million last year. In fact, 90% of new net-adds in 1Q18 came from areas like connected cars and the IoT.[11]

TOTAL REPORTED DATA-ONLY DEVICES



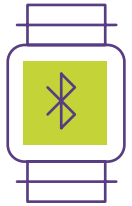
+147%
in the last five years

+19.5%
from 2016-2017 alone

These data-only devices are installed in connected cars, homes, and public and private infrastructure, including both business and consumer products.

Health and fitness monitors

Cellular-connected IoT devices



Smartwatches

And other connected devices

This future is just beginning. A fully enabled and deployed Internet of Things promises to improve nearly everything, from grocery shopping to transportation systems—all through the power of wireless connectivity.

> *"The industrial Internet of Things … is one of the most important national interests we have … There's going to be 50 billion inter-connected devices [and this] will lead to increased economic growth, job creation, and greater human safety."*
>
> — Michael Fitzpatrick,
> Head of Regulatory Advocacy, GE

Industry Investment and Innovation Driving Wireless Today and Tomorrow

This story of growth is made possible due to the industry's remarkable investment in infrastructure, technology, and people.

WIRELESS CAPITAL EXPENDITURES

More than **$226 billion invested** since 4G networks were launched in 2010

$25.6B
in 2017 alone

These expenditures are made to keep up with consumer demand and invest in tomorrow's networks.

In addition to capital expenditures, the wireless industry has also spent billions of dollars on spectrum licenses. Licensed spectrum is a key resource for the industry to provide secure, reliable coverage across the U.S.

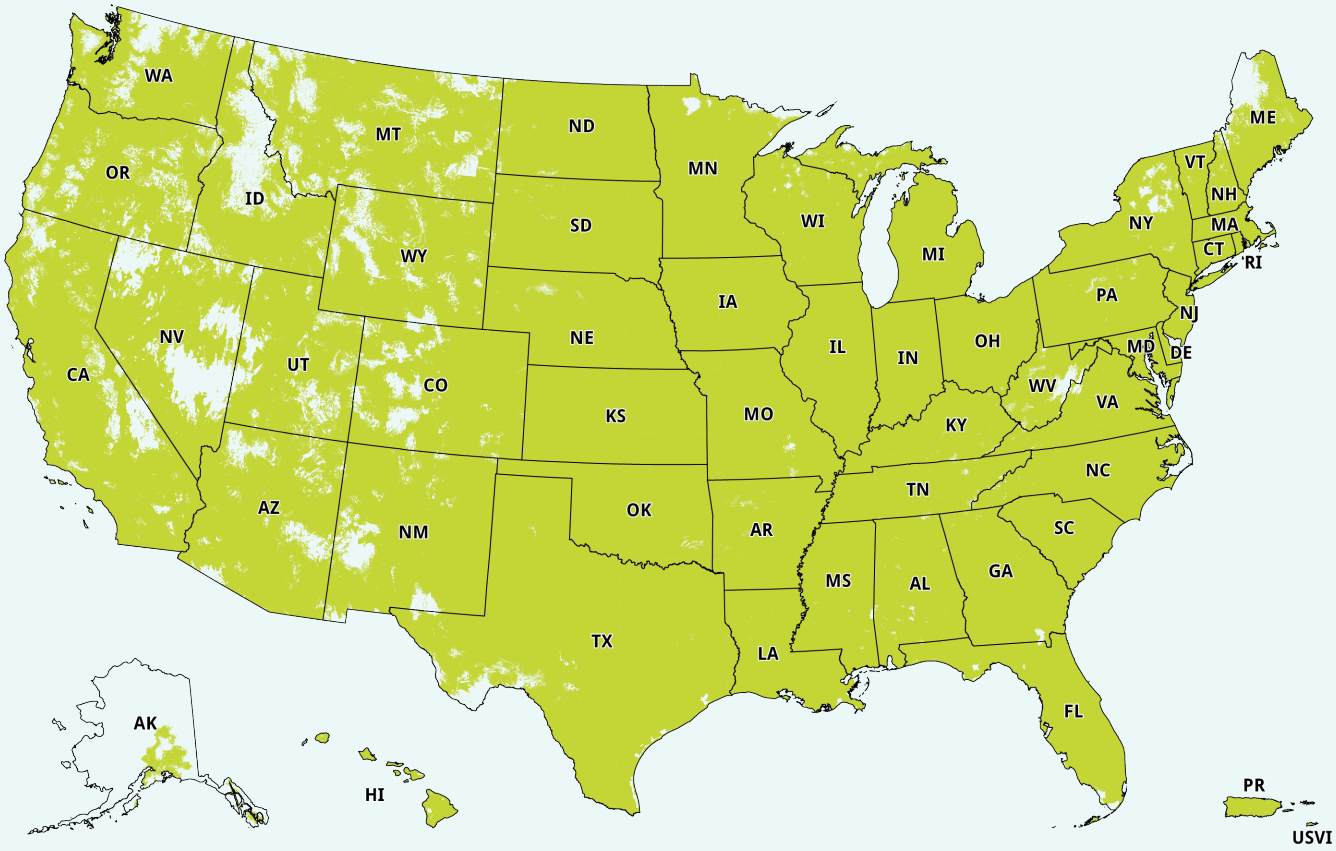
Since 1994, FCC spectrum auctions have raised over $114 billion in revenue for the government.[12]

The results of these capital and spectrum investments are clear: **continuous improvements in coverage and better mobile experiences.**

Wireless coverage continues to expand.

The first 4G networks were rolled out in the U.S. in 2010. Today—just seven years later—**these high-speed mobile networks cover 99.7% of all Americans**. And 98% of all Americans have a choice of three or more mobile service providers, according to the FCC.[13]

4G LTE COVERAGE IN 2017



Over the past five years, more than 1.5 million additional rural Americans have been covered by mobile broadband.

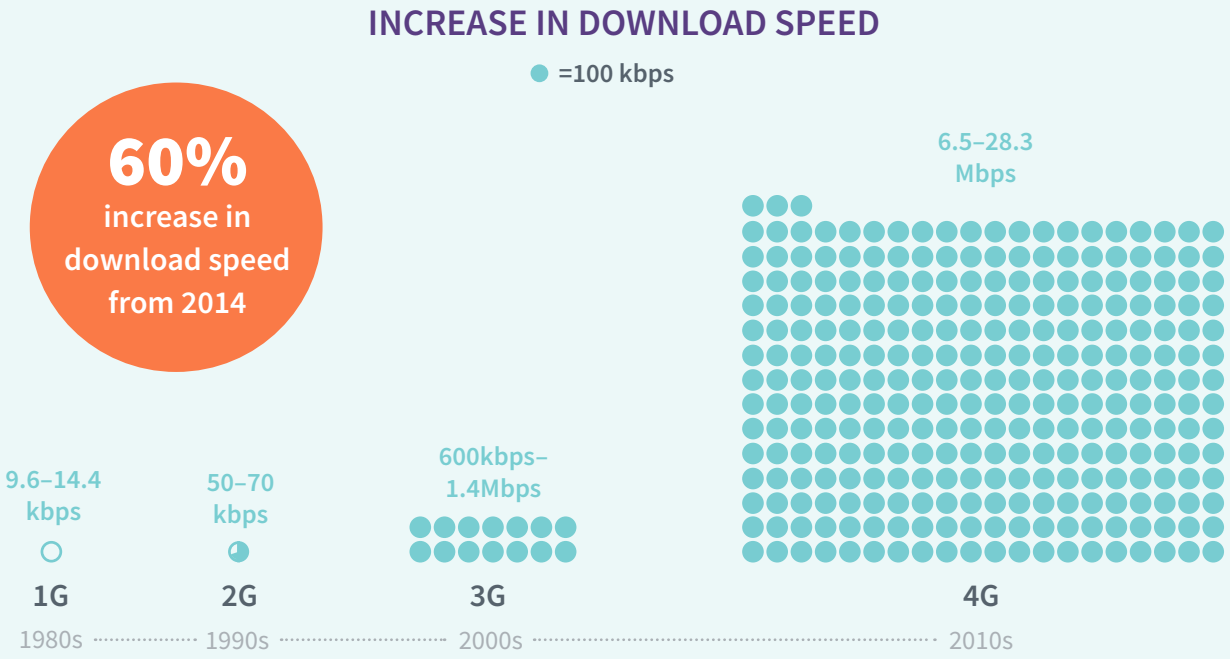
This coverage supports American businesses, students, healthcare providers, and others across the country, providing the connectivity for whatever their wireless needs may be.

> *"Wireless has been a tremendous help to our farming operation, because it's keeping me connected anywhere on the farm … 4G LTE has impacted the business because the transmission speeds, the data speeds are much faster. We're able to incorporate that into technology and our equipment to make better decisions."*
>
> — Shane Wells
> Owner, Mockingbird Hill Farms

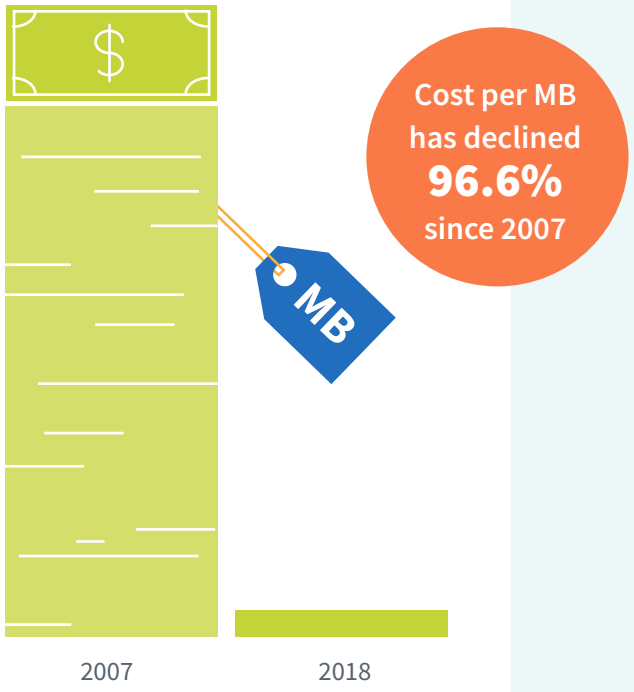
Tireless innovation yields better products and services.

Today, we can pick from hundreds of handsets, multiple operating systems, millions of apps and services, and nearly 700 different smartphone plans.

Our wireless speeds keep getting faster. **Today's 4G mobile data speeds are more than 38 times 3G speeds a decade ago**, and today's average download speed—22.69 Mbps—is a 60% increase from 2014. Next-generation 5G networks will be even faster.



As wireless use continues to grow, we keep delivering more value. In fact, last year, the average price for a set of core consumer goods fell for the first time since January 2010, all thanks to declining price of wireless service.[14]



From energy and transportation to public safety and health care, wireless connectivity is enabling dynamic new services and applications that improve—and save—lives.

> *In 2018, we have remote examinations and devices that can wireless connect patient with their providers … giving patients timely and convenient access to health services. This improves chronic disease management, reduces the burdening costs of transportation and … decreases hospital readmissions.*

—Dr. Rheuban, Medical Director,
UVA Center for Telehealth

Wireless Powers the U.S. Economy

Wireless plays a pivotal role in driving our economy today. The wireless industry contributes

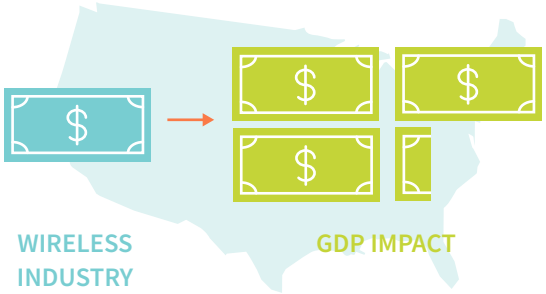
$475B

to the U.S. economy annually, **2.6%** of 2016 U.S. GDP.

That makes the U.S. wireless industry the **24th largest** economy in the world[15]

From our direct impact to our indirect contributions, wireless is an economic accelerator.

Every dollar of the wireless industry's direct GDP contribution generates $3.20 of total GDP impact across the broader economy.



The wireless industry's contribution to the U.S. economy trumps others'.

3x

3x that of the agriculture, forestry, fishing, and hunting industries

4x

Almost 4x the motion picture and sound recording industries

4.5x

Almost 4.5x the air transportation industry

An entire ecosystem of jobs is built on the foundation of wireless networks. From tower techs and network architects to customer service representatives and accountants, wireless providers employ people in all corners of the country to provide world-class service.

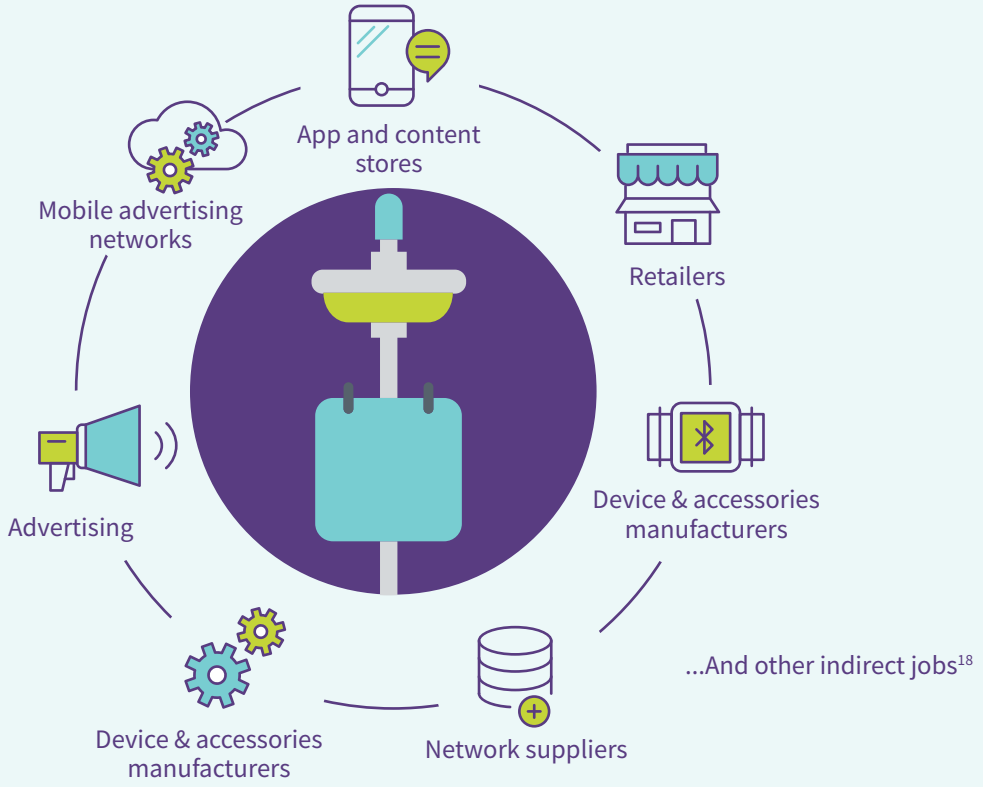
In 2017, wireless providers alone directly employed 207,324 people across the country.

These wireless jobs are good jobs with good salaries.

Wireless employee wages are 50% higher than the average wage.[16]

THE WIRELESS INDUSTRY IS A JOBS MULTIPLIER.

Every wireless job creates an additional 7.7 jobs throughout the broader economy[17], ultimately supporting 4.7 million U.S. jobs across ecosystem sectors.



Unleashing the Power of Next-Generation 5G Networks

Wireless is always growing, innovating, and driving the economy. Now with 5G, new cycles of innovation and investment are poised to further transform the mobile ecosystem, our way of life, and our economy.

5G BENEFITS

$275B
in investment

3M
new jobs

$500B
in economic growth[19]

Building out the wireless networks of tomorrow

The wireless industry is deploying more cell sites in more places to further extend coverage and prepare for the next generation of wireless, 5G.

A record 323,448 cell sites were in operation at the end of 2017.

+52%
in the last ten years

This number is poised to increase dramatically as the wireless industry installs more small cells—small-scale antennas and powering equipment that can be deployed on street lights, utility poles, or the sides of buildings—to densify 4G networks and provide the bedrock for 5G networks.

The number of small cells deployed is predicted to rapidly increase over the next few years from about 13,000 small cells in 2017 to 86,000 this year—a 550% increase—and over 800,000 by 2026.

This increase underscores the importance of every level of government modernizing its wireless infrastructure rules.

+550%
increase in 2018

Preparing for 5G

America's wireless providers and equipment vendors have conducted dozens of 5G trials across the country. Thanks to those trials and industry investment in the technology and people that will enable 5G, the U.S. will begin to see this next generation as early as this year.

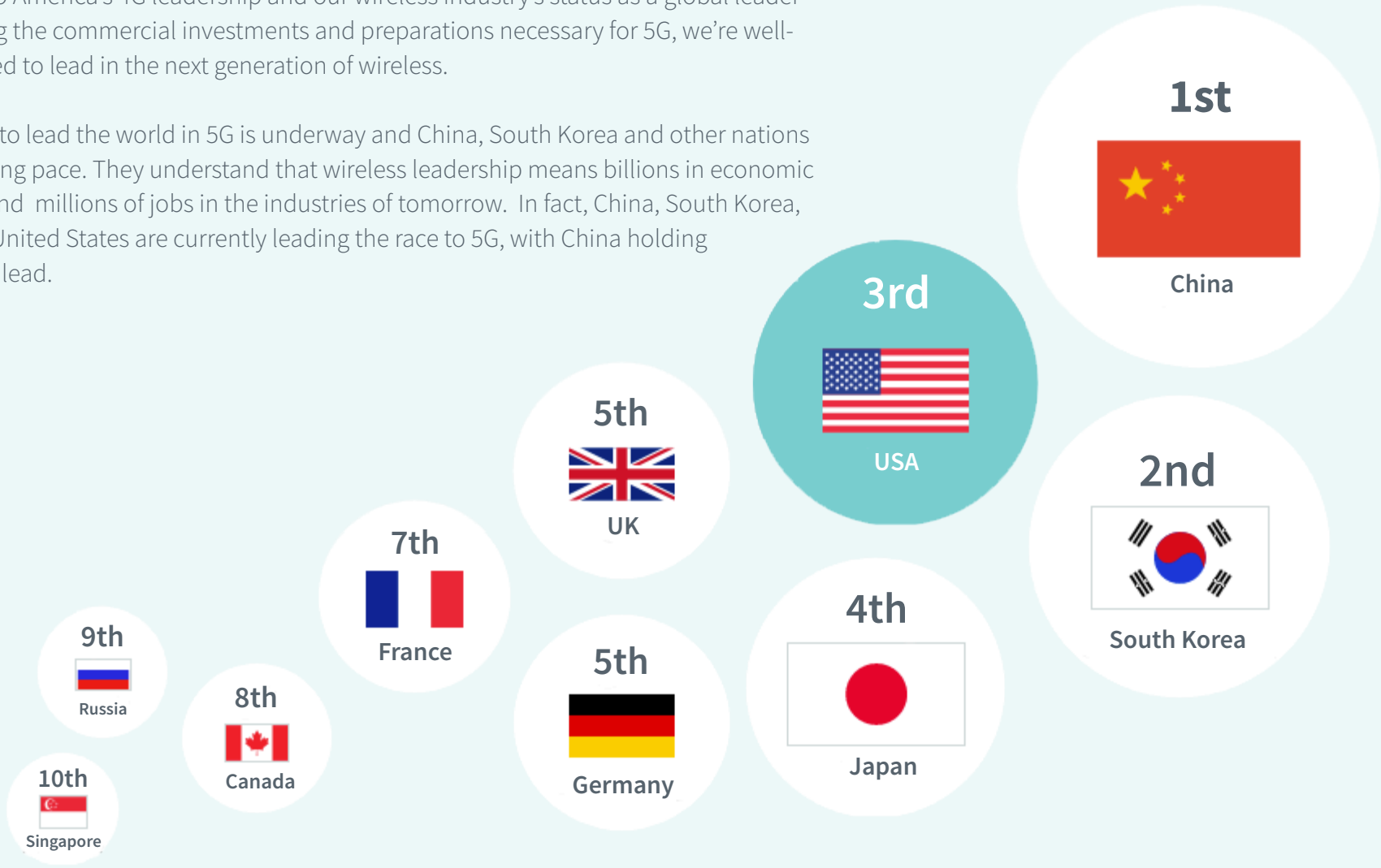
Driven by intense competition, all national wireless providers have revealed 5G deployment plans with new announcements happening all the time. Communities across the country will soon see the beginning of 5G networks.

5G will be deployed in at least **30 markets** by early 2019

Winning the Race to 5G

Thanks to America's 4G leadership and our wireless industry's status as a global leader in making the commercial investments and preparations necessary for 5G, we're well-positioned to lead in the next generation of wireless.

The race to lead the world in 5G is underway and China, South Korea and other nations are keeping pace. They understand that wireless leadership means billions in economic growth and millions of jobs in the industries of tomorrow. In fact, China, South Korea, and the United States are currently leading the race to 5G, with China holding a narrow lead.



There are real and significant advantages to maintaining global wireless leadership. America's 4G leadership resulted in economic and job growth that would have otherwise gone to other countries.

Just as winning the race to 4G required smart government policies, winning the race to 5G will require swift action on pending legislation and regulatory reforms, including setting a clear schedule of future spectrum auctions and modernizing infrastructure siting rules.

We are confident with the significant industry investment ongoing and the important pending reforms before policymakers, the U.S. is positioned to lead the world again in 5G.

4G LEADERSHIP-DRIVEN ECONOMIC BENEFITS[20]

$125B

in revenue to American companies

$100B

GDP increase

84%

increase in wireless-related jobs

Sources

[1] http://www.pewinternet.org/fact-sheet/mobile/

[2] http://www.pewinternet.org/fact-sheet/mobile/

[3] http://www.pewinternet.org/2011/07/11/overview-of-smartphone-adoption/

[4] Morning Consult survey: nationwide poll of 2,035 registered voters between Dec 19 and Dec 21, 2017

[5] CTIA 2017 Harris Poll 5G Executive Survey. The study was conducted August 3-21, 2017, online by Harris Poll on behalf of CTIA among 507 executives in the U.S. working in the healthcare, transportation, energy, and manufacturing industries.

[6] https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201712.pdf

[7] http://www.pewinternet.org/fact-sheet/mobile/

[8] http://www.pewinternet.org/fact-sheet/mobile/

[9] http://www.pewinternet.org/fact-sheet/mobile/

[10] Morning Consult survey: nationwide poll of 1,991 registered voters between Jan 30 and Feb 1, 2018

[11] https://www.fiercewireless.com/iot/90-industry-s-net-adds-now-coming-from-connected-cars-iot-chetan-sharma

[12] https://apps.fcc.gov/edocs_public/attachmatch/DOC-349145A1.pdf (p.48)

[13] https://us-fcc.app.box.com/s/uoh8tfrnzwhehw88lk5ojd3o7yldchj0

[14] https://www.ctia.org/news/getting-more-for-less-how-wireless-competition-and-unlimited-data-help- america-s-economy

[15] https://www.ctia.org/news/how-the-wireless-industry-powers-the-u-s-economy

[16] https://www.bls.gov/data/#employment

[17] https://www.ctia.org/news/how-the-wireless-industry-powers-the-u-s-economy

[18] https://www.ctia.org/news/how-the-wireless-industry-powers-the-u-s-economy

[19] https://www.ctia.org/docs/default-source/default-document-library/how-5g-can-help-municipalities-become-vibrant-smart-cities-accenture.pdf

[20] https://api.ctia.org/wp-content/uploads/2018/04/Race-to-5G-Report.pdf (page 4)

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