Summary of CTIA's Annual Wireless Industry Survey

CTIA's annual wireless industry survey continues to document the industry's ongoing commitment and contributions to the American economy.

2020 and 2021 were years like no other as Americans navigated the challenges of the COVID-19 pandemic. The wireless industry was there every step of the way, keeping customers connected, helping students learn remotely, and providing for American communities.

Even with such unexpected events, the industry remained focused on investing in the power of wireless and the widespread rollout of 5G service. As 5G continues to spread throughout the country, enabling new use cases and establishing the broad platform for the 5G Economy, CTIA's annual survey of wireless service providers demonstrates:

Remarkable and Sustained Wireless Investment.

In 2021, wireless providers invested ~$35 billion, the fourth straight year of increasing capital expenditures to power America's world-leading wireless networks. Over the past five years, wireless providers have invested nearly $147 billion, and over the life of the wireless industry, total capital investment is over $635 billion. This investment is in addition to the $233 billion in payments to the government for the spectrum needed to power wireless networks.

America's Demand for Wireless Data Continues to Grow.

In 2021, mobile wireless data traffic topped 53 trillion megabytes, a 289 percent increase since 2016. Over the past decade, America's wireless users have driven a 138x increase in mobile data traffic with an ever-growing appetite for mobile internet use, apps, and video streaming—alongside a rise in the number of smartphones and IoT devices.

Wireless Providers Are Building the Infrastructure for Our Country's Future.

Over the past five years, operational cell sites have increased over 26 percent—59 percent of the cell sites built in the last decade were built since the implementation of historic federal siting reforms. Now numbering over 418,000, these sites provide the physical platform for the U.S. 5G Economy.

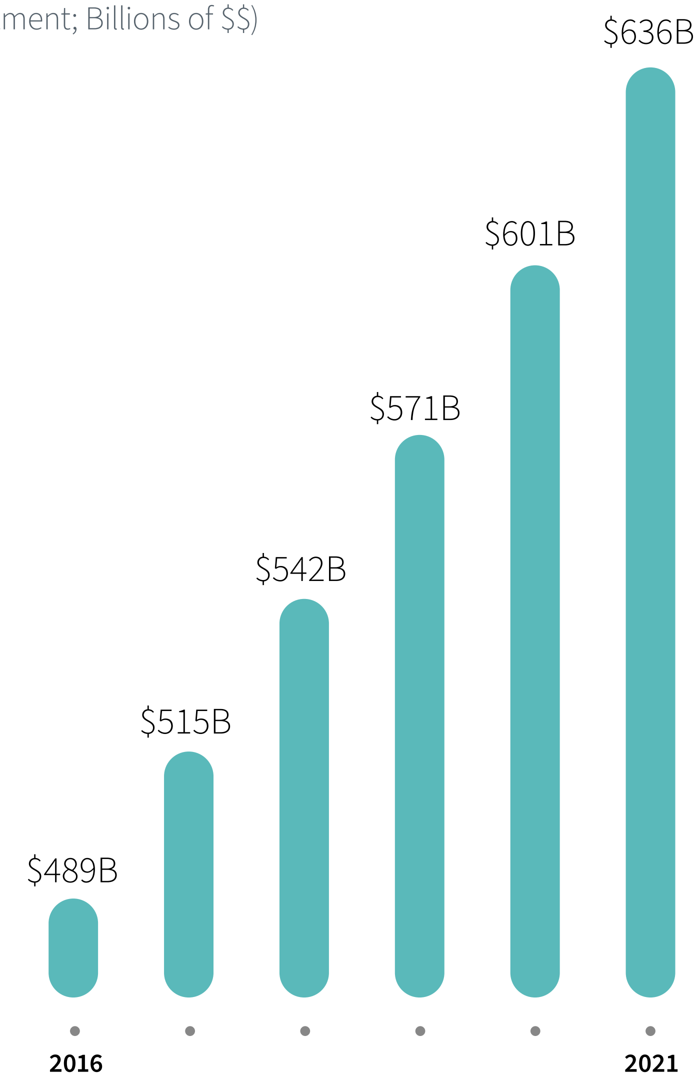
Significant Growth in 5G and Internet of Things Devices.

Active 5G devices on carriers' networks grew 513 percent year-over-year, totaling more than 85 million at year-end 2021. Data-only devices—think smartwatches, hotspots, and medical sensors, for instance—now represent 42 percent of all estimated devices. Totaling almost 208M, these data-only devices have grown 4x since 2013.

The following graphs, charts, and information on the survey methodology further explain the results and survey history.

Remarkable & Sustained Wirelesss Investment

(Cumulative investment; Billions of $$)



2021 is the fourth straight year of increasing capital expenditures. Over the past 5 years, wireless providers invested nearly **$147 billion**, and over life of the industry almost **$636 billion**.

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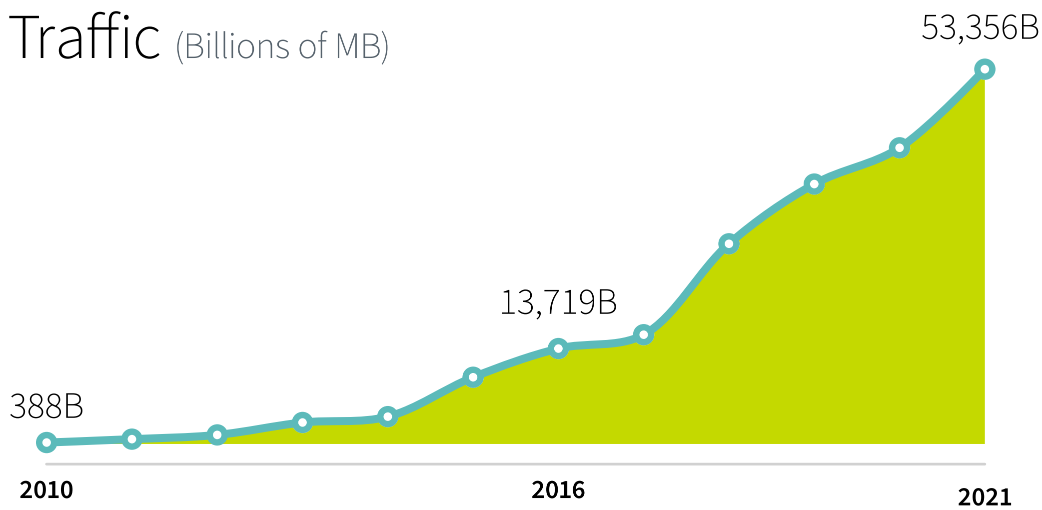
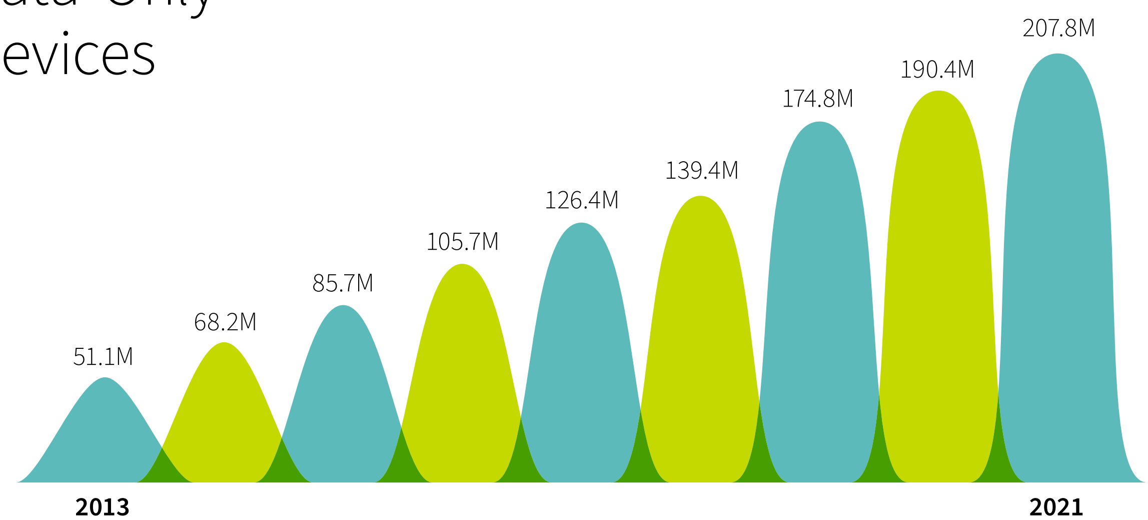
Reported Wireless Data Traffic (Billions of MB)



Annual wireless data traffic grew **138x** since 2010,
a **289%** increase from 2016

Data-Only Devices



Data-only devices have grown **306%** since 2013.

Background on CTIA's Wireless Industry Survey

CTIA's wireless industry survey develops industry-wide information drawn from operational member and non-member wireless service providers. It has been conducted since January 1985, originally as a cellular-only survey instrument, and now including the community of CMRS licensees (e.g., PCS, ESMR, AWS, BRS and 700 MHz license holders). No break-out of results specific to spectrum bands or licenses is performed. From January 1985 through December 2012, it was conducted as a semi-annual survey, and it is now conducted on an annual basis.

The information determined based on the survey includes: number of cell sites, total service revenues, the average revenue per unit (ARPU), and various measures of usage (e.g., minutes and megabytes). The ARPU figure is not equal to the average monthly bill, which may reflect provision of service to multiple devices on a single account.

CTIA's survey develops information on the number of reported wireless service subscribers or connections for the responding systems, and an estimated total connections figure (taking into account non-responding systems). Because CTIA's survey is a voluntary survey, it cannot compel responses from wireless carriers. However, the survey has an excellent response rate. For the December 31, 2021, installment of the survey, CTIA aggregated data from companies serving more than 98 percent of all estimated wireless subscriber connections (excluding some machine-to-machine and other units not treated as subscriber connections for reporting purposes by some carriers).

Because not all systems do respond, CTIA develops an estimate of total wireless connections. The estimate is developed by determining the identity and character of non-respondents and their markets (e.g., RSA/MSA or equivalent-market designation, age of system, market population), and using surrogate penetration and growth rates applicable to similar, known systems to derive probable subscribership. These numbers are then summed with the reported subscriber connection numbers to reach the total estimated figures. No carrier-specific or market-specific information is maintained as a result of the survey. All such information is aggregated by an independent accounting firm to a nationwide level. The underlying source material for the survey is then destroyed per confidentiality agreements.

The following tables and charts reflect selected top-of-the-line data. Complete results of CTIA's survey are available for purchase in the comprehensive report, **CTIA's Wireless Industry Indices: 1985 – 2021**, including data on revenues, subscriber usage, investment, and other operational indicators and ratios.

The report is available for a member price of $850 and a non-member price of $1,075. Subsequent copies are available to members at $475 each and to non-members at $535 each. Two year subscriptions are available at a member price of $1,445 and non-member price of $1,825.

To order this report contact research@ctia.org or order online at store.ctia.org

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CTIA annualized wireless industry survey results – 2001 to 2021

Date	Estimated Total Subscriber Connections	Annual Services Revenues ($000s)	Cumulative CapEx ($000s)	Cell Sites	Monthly Average Revenue Per Unit
2001	128,374,512	$65,316,235	$105,030,101	127,540	$49.79
2002	140,766,842	$76,508,186	$126,922,347	139,338	$51.00
2003	158,721,981	$87,624,093	$145,866,914	162,986	$51.55
2004	182,140,362	$102,121,210	$173,793,507	175,725	$52.54
2005	207,896,198	$113,538,220	$199,025,327	183,689	$50.65
2006	233,040,781	$125,456,825	$223,158,248	195,613	$49.07
2007	255,395,599	$138,869,304	$244,591,206	213,299	$49.26
2008	270,333,881	$148,084,170	$264,760,517	242,130	$48.87
2009	285,646,191	$152,551,854	$285,121,591	247,081	$47.97
2010	296,285,629	$159,929,649	$310,014,851	253,086	$47.53
2011	315,963,848	$169,767,314	$335,331,967	283,385	$46.11
2012	326,475,248	$185,013,935	$365,426,326	301,779	$48.99
2013	335,652,171	$189,192,812	$398,567,671	304,360	$48.79
2014	355,445,472	$187,848,447	$430,642,374	298,055	$46.64
2015	377,921,241	$191,949,025	$462,605,007	307,626	$44.65
2016	395,881,497	$188,524,256	$488,996,535	308,334	$41.50
2017	400,205,829	$179,091,135	$514,625,256	323,448	$38.66
2018	421,793,010	$182,779,484	$542,033,353	349,344	$37.85
2019	442,456,704	$187,361,982	$571,125,121	395,562	$36.86
2020	468,898,212	$189,912,441	$601,018,145	417,215	$35.31
2021	498,910,316	$204,214,004	$635,759,036	418,887	$35.74

Cumulative Capital Investment Reached ~**$636 Billion** at Year-end 2021 ctia™