

US State of the Mobile Union 2H 2021

Carrier performance at national, state, and metro levels, plus a look at 5G in the US.



Data usage continues to explode and is showing no signs of slowing down. From gaming on the go to Zoom meetings and everything in between, the importance of fast and reliable mobile connectivity has never been greater. The good news is that all three major carriers are performing well, and 5G keeps expanding and improving.

Read on to see how AT&T, T-Mobile, and Verizon performed during our second-half 2021 testing across the entirety of the United States, each of the 50 states, and 125 of the country's most populated metropolitan markets (as defined by US Census Bureau's Census Urbanized Areas or CUAs). We've also included a high-level look at 5G performance, and our 2H 2021 5G summary report is coming soon.



Key takeaways

AT&T impresses in state and national testing:

In a shift from our previous report, AT&T won or shared the most United States RootScore Awards of any carrier for the first time. AT&T doubled its total of US RootScore Awards from three to six since 1H 2021, while edging past Verizon to take home the most State RootScore Awards of any carrier. AT&T also maintained its reputation for delivering good speeds, great reliability, and solid 5G results in major cities.

T-Mobile speeds up in major cities and beyond:

Not only was T-Mobile the only carrier to deliver a median download speed above 100 Mbps in our metro area testing, it hit that mark in nearly 50 cities while also delivering outstanding 5G availability and speed results. T-Mobile also showed improvement in our state and national testing, delivering easily the fastest median download speed across the entirety of our US testing.

Verizon delivers outstanding results across the board:

Verizon's performance was excellent in 2H 2021, earning four US RootScore Awards, posting great results in state testing, and taking home by far the most Metro RootScore Awards of any carrier. Verizon delivered fast speeds and superb reliability in major metros. Verizon also registered excellent 5G reliability, while showing improved 5G availability and speeds in many cities across the country.

New 5G report coming soon:

Stay tuned for our upcoming 2H 2021 5G summary report.

Performance across the United States

Providing strong service across the entirety of the US is a tall order. To earn our US RootScore Awards, a carrier needs to offer outstanding performance across all the different spaces where consumers use their smartphones, from cities and towns of all sizes, to roadways, rural areas, and all the places in between.



United States RootScore Award winners - 2H 2021

Performance category	AT&T	T-Mobile	Verizon
Overall experience	Shared Winner		Shared winner
Reliability	Winner		
Accessibility			Winner
Speed	Winner		
Data	Winner		
Call	Shared Winner		Shared winner
Text	Shared Winner		Shared winner

The RootScore Award winners table looks at which carrier(s) took the prize in each performance category, while the second chart below goes a step further, showing the complete rankings and RootScores in each category.

United States RootScores 2H 2021

Rank	Overall	Reliability	Accessibility	Speed	Data	Call	Text
1	95.5 95.4	96.0 95.7	95.7	97.4	97.4	93.4 93.5	96.8 96.5
2		95.7	93.4	94.6	96.4		
3	90.6	90.5	91.5	94.0	94.6	84.8	92.3

1H 2021 2H 2021

AT&T T-Mobile Verizon

United States - Key takeaways (alphabetized by carrier)

AT&T shines on the national stage, winning six out of seven US RootScore Awards:

AT&T increased its national award tally by three since 1H 2021. AT&T improved its rankings from second place to first in the categories of overall performance, reliability, and call performance since 1H 2021. In fact, AT&T’s first-place finishes for both overall and reliability performance in 2H 2021 marks the first time that Verizon didn’t win both awards outright. AT&T also held on to its awards for speed, data, and text performance. While AT&T’s aggregate median download speed in our US testing wasn’t as fast as that of the other carriers, AT&T recorded particularly strong 5th percentile speed results (a key measure of speed consistency), which helped the carrier earn its second consecutive US Speed RootScore Award.

T-Mobile delivers the fastest speed across the US and continues its upward trend outside of big cities:

T-Mobile has continued to improve its results outside of major metropolitan markets over the past year. As T-Mobile integrates more and more of the highly coveted mid-band spectrum it acquired from Sprint into its 5G network, the carrier’s speeds keep getting faster in general. In fact, T-Mobile’s US median download speed of 79.8 Mbps improved by a jaw-dropping 163% since 1H 2021 (30.3 Mbps) and was much faster than that of any other carrier. T-Mobile also improved its ranking in the network accessibility category (which looks at how quickly you can access the network) from third in 1H 2021 to second this time, while posting RootScores above 90 in six out of seven categories.

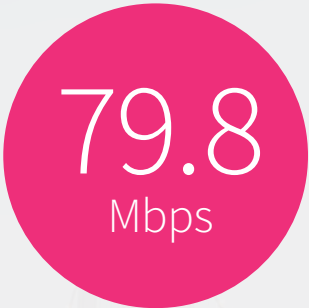
Verizon delivers great results at the national level, taking home four US RootScore Awards:

Verizon had another strong showing in our national testing, taking home the US Overall and Call RootScore Awards for the seventeenth straight test period, a period spanning more than eight years. Verizon also earned US RootScore Awards for accessibility and text performance, while delivering the second-fastest median download speed across the US at 40.8 Mbps, marking an improvement of nearly 20% since 1H 2021. While Verizon earned one fewer US RootScore Award than it did in 1H 2021, the carrier performed well in every category, finishing a close-second behind AT&T in the categories it didn’t win.

United States speeds (ordered alphabetically)



AT&T



T-Mobile



Verizon

Note: The speeds above show each carrier’s aggregate median download speed across the entirety of the US.



Mobile performance across the 50 states

Providing good service across an entire state isn't easy. Excelling in metropolitan markets or big cities doesn't necessarily mean that strong service will translate to success in other areas of a state. Our State RootScore studies balance performance from dense urban areas, smaller towns, rural spaces, and highways to paint a complete picture of the consumer mobile experience at the state level.



State RootScore Award tally - by category

	Overall	Reliability	Accessibility	Speed	Data	Call	Text	Total
AT&T	35	37	1	47	42	36	46	244
T-Mobile	0	0	8	9	2	1	6	26
Verizon	37	35	49	16	24	42	36	239

Note: Award tallies include both outright wins and ties.

Key takeaways (alphabetized by carrier)

AT&T posts sterling state-level results, taking home the most awards of any carrier: Similar to what we saw at the national level, AT&T showed excellent improvement in our state testing in 2H 2021. AT&T picked up an additional 27 State RootScore Awards since 1H 2021, allowing the carrier to narrowly surpass Verizon and lead the competition with 244 state-level awards out of 350 total chances. AT&T's award gains largely came in the key categories of overall performance, reliability, and call performance, across which AT&T earned 29 additional awards since 1H 2021. AT&T also impressed in the network speed category, winning or sharing the speed award in 47 states, a tally nearly three times higher than that of Verizon, its closest competitor in the category.

T-Mobile's mid-band 5G improvements having an effect at the state level: Building on the improvements T-Mobile showed in our last report (in which T-Mobile improved its state-level award total by five), the carrier stepped up further this time, earning 10 more State RootScore Awards than it did in 1H 2021. While T-Mobile's award tally was far behind those of AT&T and Verizon, the carrier has shown clear progress in both our national and state testing since 1H 2021. As T-Mobile continues to boost its usage of mid-band spectrum outside of major cities, we could see further improvements to come.

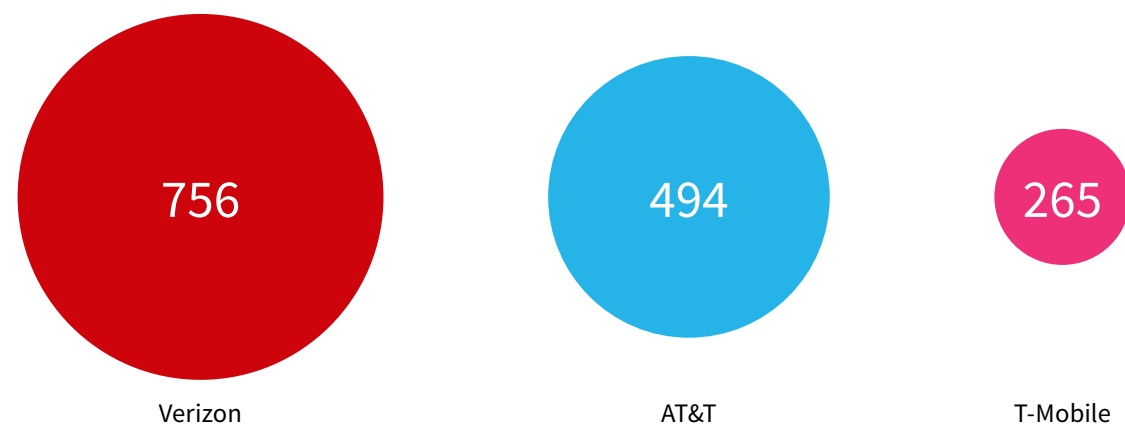
Verizon registers great results at the state level: Verizon took home 239 State RootScore Awards, a tally over 9 times higher than T-Mobile's 26 but 5 awards behind that of AT&T (244). Verizon fared especially well in the important categories of overall performance, network accessibility, and call performance, taking home the most awards in each category. Verizon also showed outstanding reliability results, with 35 awards in the category, far more than T-Mobile (0) but two behind that of AT&T (37). Verizon and AT&T are in a tight race in our testing across the 50 states, with both carriers remaining a tier above T-Mobile.

Metro area performance

Major metropolitan markets are much more than just city centers. They also include the suburbs, business districts, tourist areas, and the roadways that connect them. With 5G expanding and improving in the US, end users expect fast and reliable mobile performance 24/7, whether they live and work in a metropolitan market or are visiting on vacation.

This section of our report provides a carrier-by-carrier overview of performance across 125 of the most populated metro areas in the US, as well as a high-level look at 5G availability and speed results for each carrier.

Metro Area RootScore Award tally



Note: Award tallies include both outright wins and ties.

Metro performance in a nutshell:

AT&T continued its trend of delivering strong results in major metros, recording fast speeds and great reliability. While AT&T didn't show the level of improvement it did in state or national testing, AT&T earned the second-highest tally of Metro RootScore Awards and posted good 5G availability and reliability results.

T-Mobile's speeds were much, much faster than they were in 1H 2021. The carrier also increased its tally of Metro RootScore Awards since the first half of 2021. T-Mobile's 5G results were outstanding, providing users with a sterling combination of widespread 5G availability plus fast speeds.

Verizon remained the carrier to beat in metro area testing, winning or sharing by far the most Metro RootScore Awards of any network, while recording fast speeds and stellar reliability. Verizon's 5G speeds showed improvement, and its 5G data reliability was excellent.



AT&T earns the second-highest tally of awards, with good speeds and great text results.

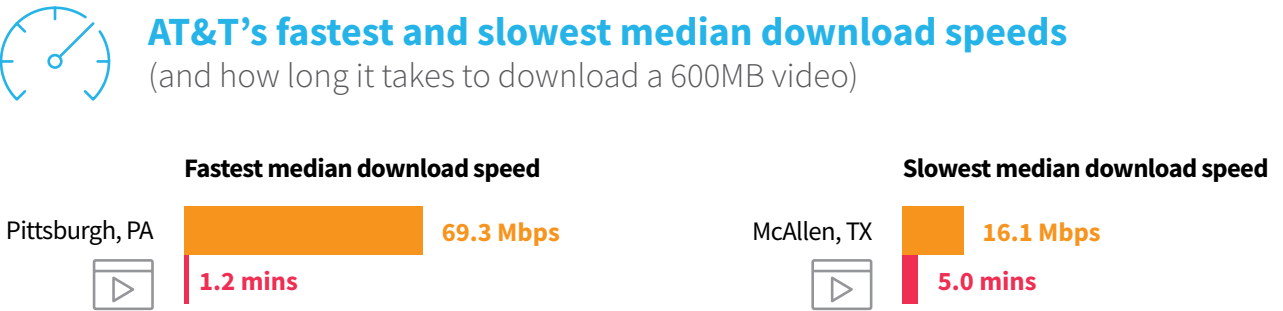
Good speeds similar to those from 1H 2021: AT&T delivered strong speeds that were generally consistent with its results from the first half of 2021. In fact, the carrier’s tally of 62 markets with median download speeds above 40 Mbps was identical to its total from 1H 2021. That said, AT&T registered speeds above 50 Mbps in seven fewer markets than it did in the first half of the year, while delivering speeds below 20 Mbps in three more cities. The bottom line, though, is that AT&T’s speeds were fast enough for nearly any consumer activity, and its tally of Speed RootScore Awards (77) was higher than that of T-Mobile (67) and narrowly trailed that of Verizon (81).

Impressive award total: AT&T took home the second-most RootScore Awards of any carrier in 2H 2021, with its total of 494 far higher than that of T-Mobile (265) but much lower than that of Verizon (756). While AT&T’s award total declined by 74 since 1H 2021, the carrier’s tally was still quite high and over 100 more than it was a year ago (383 in 2H 2020). AT&T fared particularly well in the categories of reliability, call, and text performance, winning at least 90 awards in each, including the most Text RootScore Awards of any carrier at 123.

Strong 5G availability and reliability: AT&T delivered a strong combination of 5G availability and reliability in 2H 2021. While AT&T’s 5G median download speeds weren’t as fast as those of T-Mobile or Verizon in many cities, they were still solid and should improve once the carrier implements the **C-Band spectrum** it picked up at auction for \$23B in 2021.

AT&T’s median download speed intervals (all network technologies)						
Median download speed intervals	0-10 Mbps	10-20 Mbps	20-30 Mbps	30-40 Mbps	40-50 Mbps	50+ Mbps
2H 2021	0	6	24	33	38	24
1H 2021	0	3	26	34	31	31

- Number of markets out of 125 in which AT&T delivered median download speeds at various intervals.
- Median download speeds from on the table above represent speeds recorded on all network technologies, including 5G, where available.



Speeds above show the markets in which AT&T recorded its fastest and slowest median download speeds (Mbps), and the times indicate how long it typically takes to download a 600MB video at each speed (times in minutes).

AT&T Metro Area RootScore Award tally

AT&T	Outright	Ties	2H 2021 total
Overall RootScore Award	9	40	49
Reliability RootScore Award	15	75	90
Accessibility RootScore Award	1	5	6
Speed RootScore Award	17	60	77
Data RootScore Award	18	33	51
Call RootScore Award	7	91	98
Text RootScore Award	1	122	123
Total awards	68	426	494

T-Mobile delivers amazing speeds in many cities, along with widespread 5G availability and great 5G speeds.

T-Mobile users seeing incredible speeds: The only carrier to deliver a median download speed above 100 Mbps, T-Mobile hit that mark in a whopping 47 markets, up from zero in 1H 2021. What’s more, T-Mobile surpassed 200 Mbps in 13 of those cities and even topped 300 Mbps in two. When looking at our intervals, T-Mobile’s 93 markets with median download speeds above 50 Mbps was more than those of AT&T (24) and Verizon (34) combined. T-Mobile also improved at the lower end, not recording any median download speeds below 20 Mbps, an improvement from 23 last time. Why the huge speed gains? T-Mobile has continued to integrate more **mid-band spectrum** into its 5G network, and as a result, its 5G and overall median download speeds across all network technologies have increased.

Far more network speed awards: T-Mobile’s RootScore Award tally increased by 30 since 1H 2021, the biggest improvement of any carrier. T-Mobile made excellent progress in the speed category, increasing its tally of Speed RootScore Awards from 28 in 1H 2021 to 67 this time, which narrowed the gap considerably with AT&T (77) and Verizon (81). T-Mobile also added 22 more Data RootScore Awards to its ledger in 2H 2021 and continued to perform well in the text category, taking home 98 Text RootScore Awards.

Stellar 5G availability and much faster 5G speeds: Using roughly twice as much mid-band spectrum as it did in 1H 2021 across major metros, T-Mobile’s 5G speeds took a huge leap forward since 1H 2021. T-Mobile’s 5G median download speeds improved in every market we tested. T-Mobile also continued its trend of offering widespread 5G availability, allowing the carrier to deliver an excellent combination of availability plus performance.

T-Mobile’s median download speed intervals (all network technologies)						
Median download speed intervals	0-10 Mbps	10-20 Mbps	20-30 Mbps	30-40 Mbps	40-50 Mbps	50+ Mbps
2H 2021	0	0	7	8	17	93
1H 2021	4	19	40	33	18	11

Number of markets out of 125 in which T-Mobile delivered median download speeds at various intervals. Median download speeds from on the table above represent speeds recorded on all network technologies, including 5G, where available.

T-Mobile’s fastest and slowest median download speeds (and how long it takes to download a 600MB video)



Speeds above show the markets in which T-Mobile recorded its fastest and slowest median download speeds (Mbps), and the times indicate how long it typically takes to download a 600MB video at each speed (times in minutes).

T-Mobile Metro Area RootScore Award tally

T-Mobile	Outright	Ties	2H 2021 total
Overall RootScore Award	1	9	10
Reliability RootScore Award	0	15	15
Accessibility RootScore Award	4	13	17
Speed RootScore Award	15	52	67
Data RootScore Award	13	24	37
Call RootScore Award	0	21	21
Text RootScore Award	0	98	98
Total awards	33	232	265

Verizon wins the most RootScore Awards, with faster speeds, excellent reliability, and impressive 5G results.

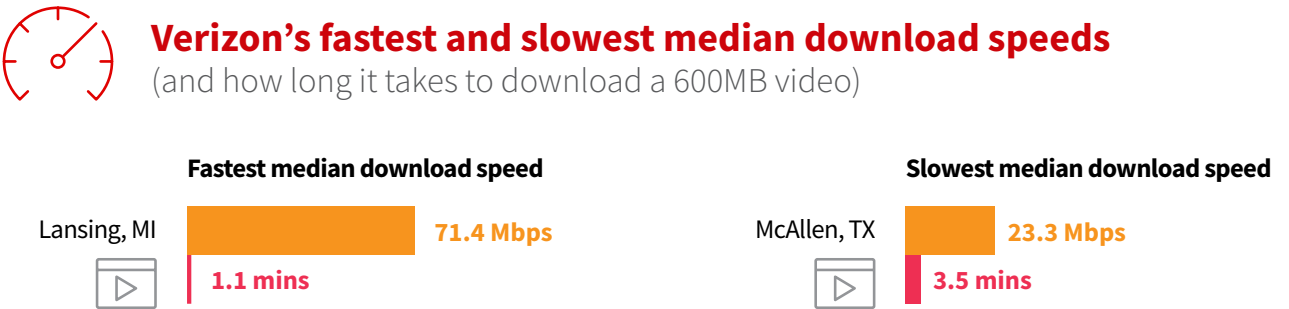
Impressive and improved speeds: Verizon’s already strong speeds showed improvement since 1H 2021. The carrier nearly tripled the number of cities in which it registered median download speeds above 50 Mbps, from 13 in 1H 2021 to 34 this time. Looking across multiple intervals together, Verizon delivered median download speeds above 40 Mbps in 45 more metros than it did in 1H 2021. And just as importantly, Verizon was one of two carriers that didn’t deliver a median download speed below 20 Mbps in a single market, an improvement from seven last time. The carrier’s fast speeds helped Verizon take home the most Speed RootScore Awards of any carrier at 81.

By far the most awards with remarkable reliability: Verizon earned 756 awards out of 875 total chances in 2H 2021, representing an incredible 86% of all possible metro awards and marking an increase from 738 in 1H 2021. Verizon users looking for stellar reliability are in luck, as the carrier’s 110 Reliability RootScore Awards was easily the most of any carrier. Verizon also shined in the key category of overall performance, taking home 114 Overall RootScore Awards, a whopping 65 more than that of any other carrier. In fact, Verizon earned the most awards in six out of seven categories, and in the seventh (text), Verizon’s tally of 122 awards trailed that of AT&T by only 1. Most of Verizon’s award gains came in the category of network accessibility, where the carrier increased its tally from 89 in 1H 2021 to 120 this time.

Excellent 5G reliability and faster 5G speeds: Verizon’s 5G expansion has been impressive. Having launched nationwide 5G service in October of 2020, the carrier is now offering 5G in 122 of the 125 cities we tested. Verizon delivered faster 5G median download speeds in most cities since 1H 2021, and the carrier’s 5G reliability results were superb. With Verizon investing a staggering \$45B at the **C-Band auction** in 2021—more than AT&T and T-Mobile combined—the carrier’s results should only continue to improve once that new mid-band spectrum is integrated into its network.

Verizon’s median download speed intervals (all network technologies)						
Median download speed intervals	0-10 Mbps	10-20 Mbps	20-30 Mbps	30-40 Mbps	40-50 Mbps	50+ Mbps
2H 2021	0	0	5	32	54	34
1H 2021	0	7	28	47	30	13

- Number of markets out of 16 in which Verizon delivered median download speeds at various intervals.
- Median download speeds from on the table above represent speeds recorded on all network technologies, including 5G, where available.



Appendix

New 5G report coming soon:
Stay tuned for our upcoming 2H 2021 5G summary report.

How we test

We believe that real-world results come from real-world testing. All RootMetrics testing is conducted from the consumer's point of view. In 2H 2021, we used Samsung Galaxy S21 Ultra 5G smartphones to measure 4G LTE and 5G performance for all three carriers. Tests were conducted during the day and night while walking and driving.

We utilize random sampling techniques to ensure our results offer a robust characterization of performance in the places consumers most often use their smartphones, and all testing is focused on the activities for which consumers typically use their smartphones, including data, call, and text usage.

To learn more about our testing, visit the [methodology page](#) of our website.

Testing facts & figures



The entire US



The 50 states



125 of the US's
biggest metros



3,536
indoor locations
tested



268,227
miles driven



3,018,773
total tests



Over 3,000
total places visited



For more information, visit