

47 CFR § 8.1 - Transparency.

CFR

§ 8.1 Transparency.

(a) Any person providing broadband internet access service shall publicly disclose accurate information regarding the network management practices, performance characteristics, and commercial terms of its broadband internet access services sufficient to enable consumers to make informed choices regarding the purchase and use of such services and entrepreneurs and other small businesses to develop, market, and maintain internet offerings. Such disclosure shall be made via a publicly available, easily accessible website or through transmittal to the Commission.

(b) Broadband internet access service is a mass-market retail service by wire or radio that provides the capability to transmit data to and receive data from all or substantially all internet endpoints, including any capabilities that are incidental to and enable the operation of the communications service, but excluding dial-up internet access service. This term also encompasses any service that the Commission finds to be providing a functional equivalent of the service described in the previous sentence or that is used to evade the protections set forth in this part.

(c) A network management practice is reasonable if it is appropriate and tailored to achieving a legitimate network management purpose, taking into account the particular network architecture and technology of the broadband internet access service.

[83 FR 7922, Feb. 22, 2018]

TECHDIRT

GREENHOUSE

TECH & COVID

FREE SPEECH

DEALS

JOBS

SUPPORT TECHDIRT

 **PODCAST** Techdirt - Making A Better Internet

SOUNDCLOUD

Politician Uses Bad Cyberharassment Law To Shut Down C...

MLB Mulls Over Opposing Trademark For New Overwatch ...

Follow Techdirt

Insider Shop - Show Your Support!

READ POSTS EARLY, JOIN THE INSIDER CHAT & MORE



Essential Reading

New To Techdirt?

Explore some core concepts:

[Advertising Is Content; Content Is Advertising](#)
[Saying You Can't Compete With Free Is Saying You Can't Compete Period](#)
[An Economic Explanation For Why DRM Cannot Open Up New Business Model Opportunities](#)
[read all »](#)

Trending Posts

[Former Patent Litigator Becomes Federal Judge And Begins Advertising For Patent Trolls To Come To His Court \(And They Have In Droves\)](#)
[Federal Court Says Trump's Law Enforcement Commission Violates Federal Law](#)
[The Social Dilemma Manipulates You With Misinformation As It Tries To Warn You Of Manipulation By Misinformation](#)

Techdirt Insider Chat

Jeffrey Nonken:
<https://www.euractiv.com/section/5g/news/macron-slams-anti-5g-proponents-as-amish-causing-uproar-in-france/>
 Macron compared to Trump and Napoleon in one article.

https://www.theregister.com/2020/09/16/mod_urbz
BentFranklin:
<https://onezero.medium.com/how-to-destroy-surveillance-capitalism-8135e6744d59>
Thad: Ex-Backpage execs say judge should step aside, citing her husband, Arizona's attorney general

<https://www.azcentral.com/story/news/local/arizona-breaking/2020/09/24/ex-backpage-execs-lacey-larkin-ask-judge-leave-case-husband-attorney-general-mark-brnovich/3519624001/>

Join the Insider Chat

Recent Stories

Monday

10:44 Federal Court Says Trump's Law Enforcement Commission Violates Federal Law (6)

10:39 Daily Deal: The Complete eLearning Bundle (0)

09:31 Former Patent Litigator Becomes Federal Judge

Court Rejects Cell Site RF Signal Map In Murder Trial Because It's Evidence Of Nothing

from the *anything-to-avoid-asking-for-a-warrant dept*Fri, Jul 21st 2017 1:34pm — [Tim Cushing](#)

The Maryland Court of Special Appeals has handed down a [ruling \[PDF\]](#) on quasi-cell site location info. The evidence offered by the state isn't being so much suppressed as it is being rejected. The information wasn't obtained illegally and no rights were violated. Rather, the court finds the evidence to be questionable, as in "evidence of what, exactly?" [via [EvidenceProf Blog](#)]

Failures

The defendant in the case is charged with murder. Bashunn Phillips filed a motion to exclude the evidence, which was granted by the lower court. The state appealed. But there's nothing in it for the state.

The "evidence" -- which is going to carry around scare quotes for the remainder of this post -- doesn't tie Phillips to anything. What was submitted isn't even the equivalent of coarse cell site location info. What the state submitted is something that can easily be obtained without a warrant... because it doesn't actually target any person at all.

Phillips filed a motion in limine on August 7, 2015, seeking to exclude the RF signal propagation map and related testimony. Phillips argued that the method used to create the map was not generally accepted as reliable within the relevant scientific community under Maryland's Frye-Reed test for admissibility of evidence based on novel scientific methodology. Phillips acknowledged that cell phone tower "ping" evidence is admissible, but drew a distinction between the method used to create the RF signal propagation map and the collection of historical cell phone "ping" evidence.

This is an interesting form of evidence -- something that amounts to [cell tower hearsay](#). It's not like it's much trouble to obtain historical cell site data. This can be done without a warrant in Maryland, despite the [recent ruling](#) that requires warrants for Stingray deployment. Historical cell site location data is still a third-party record as far as the federal courts are concerned, so good faith, if nothing else, would have salvaged the warrantless harvesting of this data.

For whatever reason, local law enforcement chose to have the FBI perform a "drive test" of cell towers in the area of the criminal activity, *ten months* after it happened. Perhaps law enforcement wanted to believe this data would indicate *something* and allowed itself to be persuaded by [pitches like this one](#), from a company that offers "cell site forensics" to law enforcement agencies.

Cell Site Analysis (CSA) the science of reconstructing the physical movements of a mobile telephone or telecommunication device. The evidence produced from such advanced investigations can be especially powerful in attributing contact between individuals, proximity to a scene of crime, patterns of movement of suspects, and testing the strength of alibi evidence.

These assertions are undermined further down the page when the company explains the limits of drive tests:

How accurate is Cell Site Analysis? This is a common question and there is no short answer. A number of factors come into play, including the type of signalling technology used (GSM/UMTS/CDMA), the local topology (man made or natural obstructions), the height of the antennae, type of CDRs available, physical location of other masts, angling of the transceivers, and degree of network activity (other subscribers). In some instances Cell Site Analysis can be accurate to a few metres, or sometimes a few streets (approximately a postcode).

In other words, most likely not all that accurate. Pinning down a historical cell signal based on a 10-month

This site, like most other sites on the web, uses cookies. For more information, see our [privacy policy](#). GOT IT

service providers info on possible dead zones. That doesn't stop Afentis Forensics from wrapping up this paragraph in an overconfident manner.

However, the technique remains an extremely powerful tool to test an alibi, to show that a number of people were together at a certain time, or to highlight the fact that a suspect was at a crime scene.

The defense in this case pointed out drive tests are indicative of nothing:

Phillips maintained that drive tests are routinely performed by cell phone companies to improve coverage and minimize "dropped calls," but that they are not generally accepted in criminal investigations. Testifying for the defense, William Folson, accepted as an expert witness "in the field of cellular technology and historical cell site analysis" explained that he "consider[s] [drive tests] a waste of time" because "[t]hey add no value to the historical analysis of a cell phone." He further testified that the manner in which Special Agent Fennern had performed the drive test was not accepted as reliable in the relevant scientific community. Mr. Folson explained that the RF signal range in December 2013 when the murder occurred would be different than the range in October 2014 when the drive test was conducted because the strength of RF signals fluctuate. Because of this, according to Mr. Folson, a drive test is not representative of the strength of the RF signals on any other date. He also pointed out that drive tests were not peer reviewed, accepted by the scientific community, or used in criminal investigations.

It's almost impossible to find a drive test submitted as evidence in a criminal investigation. Granted, a search for this terminology is bound to miss a few cases, especially those behind the US government's PACER paywall, but the lack of hits suggests this "evidence" is very rarely submitted in criminal trials. [What can be found suggests the method used by the FBI](#) agent in this case is completely wrong. Ten months after the fact gives you nothing but garbage.

[T]he coverage area of a cell tower should never be part of an analyst's mapping or court presentations unless that information comes directly from the wireless telephone company in the form of a radio propagation map or in some rare cases, in the form of drive testing that occurred contemporaneous to the date and time of the incident.

Apparently, this "evidence" is a bit more popular in Australia. [A paper by a legal aid group](#) discusses several problems with using drive tests/RF signal propagation maps as evidence.

Topography, weather, usage load, broadcast wattage, and overlap of cell coverage entail that to go to point A and make test calls now with the result that some or all of those test calls go through a specified sector of a particular base station does not 'prove' that at some other earlier time calls from point A went through that same specified sector. At that other time they may have gone through another sector. When a user places a call, the cell phone connects to the cell site with the strongest signal. Indoor or outdoor use of the phone and cell phone orientation to the user's head can alter the strength of the signal. These are important considerations when attempting to recreate an alleged past event.

In general it is often easier to be more definitive about the converse proposition, namely that from the Cell ID information it is unlikely that the call was made (or received) outside a specified area. Access from the Telcos to propagation prediction modelling (ie for both 'dominant' and 'possible' coverage of relevant sectors) is helpful but insufficient to be certain about phone location.

In this context of qualified uncertainty, it is highly misleading to infer positive location with the phrase "the Cell ID identified with a call is consistent with the call being made in that location."

In the Maryland case, the state offered up two witnesses to rebut the "this data doesn't prove anything" defense argument.

Providing a different opinion and testifying for the State, Special Agent Fennern was accepted as an "expert in the field of historical cell site analysis, cellular technology, and [] radio frequency drive testing for cell phone mapping." Agent Fennern opined that factors such as weather only have a "minimal" impact on radio frequency strength. He also testified that, relying on information provided by cell phone companies, the RF

This site, like most other sites on the web, [uses cookies](#). For more information, see our [privacy policy](#). GOT IT

Privacy Law Is A Poorly-Enforced Mess (4)

Sunday

12:00 Funniest/Most Insightful Comments Of The Week At Techdirt (24)

Saturday

12:10 This Week In Techdirt History: September 27th - October 3rd (1)

Friday

19:39 Hugo Boss Opposes Artist's 'Be Boss, Be Kind' Trademark For Merch (19)

15:39 Content Moderation Case Study: Sensitive Mental Health Information Is Also A Content Moderation Challenge (2020) (7)

13:38 Why Are Senate Democrats Helping Move Forward Trump's Strategy Of Attacking The Internet? (43)

12:06 Prosecutor Says It's OK That Deputies Faked Evidence Reports Because They Didn't Know It Was A Crime (21)

[More](#)

The State also offered the testimony of T-Mobile employee Stephen Willingham, accepted as an expert in radio frequency engineering. He testified that cell phone companies use drive tests for "competitive analysis reasons." He explained that when a customer complains about a missed call, a cell phone company will use a drive test to attempt to recreate that dropped call to identify a gap in service. Mr. Willingham testified that, over time, radio frequency "[f]ootprints remain consistent as long as nothing major has changed[,]" referring to the physical layout of the cell site, such as antennas and equipment. He stated that the maximum variation he had seen for a footprint was a quarter mile.

Even if all the variables stay the same, the only thing that can truthfully be said is they're possibly accurate within a quarter mile. If that's the case, it's impossible to claim someone was at the scene of a crime using nothing more than an RF propagation map. And, if the arguments made by the defendant are any indication, the state never bothered obtaining or submitting historical cell site location info (the "ping" evidence).

The appeals court agrees with the lower court's opinion: the state can't show anyone has accepted drive tests as a reliable source of evidence in criminal cases.

After determining that the digital forensic science field is the relevant scientific community, the court found that the State's experts lacked familiarity with that field and were unable to produce studies or peer-reviewed articles in that field supporting the reliability or general acceptance of drive tests for forensic purposes. The court ultimately concluded that the State did not establish that drive tests as used by the FBI are generally accepted in the digital forensic science community. The court then mused that, even if the drive test were considered generally accepted and reliable, the State's experts were not qualified to testify because they were not members of the digital forensic science community and failed to satisfy the requirement of Maryland Rule 5-702.

This case is exceptionally weird, considering local law enforcement had help from the FBI. Unless the defendant's provider was extremely proactive in scrapping old location data and/or was unresponsive to subpoenas for call records, the state should have had something better than a drive test to place the defendant at the scene. But this is the only evidence the defendant sought to exclude, which suggests other cell records were never introduced. If so, this is a case where law enforcement had several options, but for some reason chose to use the worst one.

To print the document, click the "Original Document" link to open the original PDF. At this time it is not possible to print the document with annotations.



This site, like most other sites on the web, uses cookies. For more information, see our [privacy policy](#). GOT IT

day to put quality content out there for our community.

Techdirt is one of the few remaining truly independent media outlets. We do not have a giant corporation behind us, and we rely heavily on our community to support us, in an age when advertisers are increasingly uninterested in sponsoring small, independent sites — especially a site like ours that is unwilling to pull punches in its reporting and analysis.

While other websites have resorted to paywalls, registration requirements, and increasingly annoying/intrusive advertising, we have always kept Techdirt open and available to anyone. But in order to continue doing so, **we need your support**. We offer a variety of ways for our readers to support us, from direct donations to special subscriptions and cool merchandise — and every little bit helps. Thank you.

—The Techdirt Team

Filed Under: [cell site](#), [evidence](#), [location](#), [maryland](#), [rf](#)

21 Comments | [Leave a Comment](#)



If you liked this post, you may also be interested in...

- [Sheriff Indicted For Evidence Tampering After Footage Of Deputies Killing An Unarmed Black Man Was Destroyed By Reality Show Producers](#)
- [If We're So Worried About TikTok, Why Aren't We Just As Worried About AdTech And Location Data Sales?](#)
- [Court Tosses Surreptitious Video Recordings Holding Together Sketchy 'Human Trafficking' Investigation](#)
- [Researcher Buys Axon Cameras On eBay, Finds They're Still Filled With Recordings](#)
- [Police Memo Says Officers Raiding A Journalist's Home Were Instructed To Turn Off Their Body Cameras](#)

Reader Comments

View by: [Time](#) | [Thread](#)

Subscribe: [RSS](#)



Anonymous Coward, 21 Jul 2017 @ 1:51pm

If so, this is a case where law enforcement had several options, but for some reason chose to use the worst one.

Maybe it was the only one that could be used as evidence against Bashunn Phillips, with the others placing him somewhere else.

[\[reply to this \]](#) | [\[link to this \]](#) | [\[view in chronology \]](#)



Anonymous Coward, 21 Jul 2017 @ 2:00pm

Or it was a case of fruit of the poison tree

They know he is guilty due to evidence that they can't share to its illegal/NSA origin. They created faked data via the map to try to dance around the lack of actual evidence that they can use in court. It has worked

This site, like most other sites on the web, uses cookies. For more information, see our [privacy policy](#). GOT IT

**MOBILITY FUND PHASE II
COVERAGE MAPS INVESTIGATION
STAFF REPORT**

TABLE OF CONTENTS

Heading	Paragraph #
I. INTRODUCTION.....	1
II. BACKGROUND.....	11
III. COMPARATIVE ANALYSIS OF THE MF-II 4G LTE COVERAGE DATA	37
IV. UPLINK CHANNEL INQUIRIES	44
V. MOBILE SPEED TESTING AND ANALYSIS OF SPEED TEST DATA	52
A. Test Methodology	55
B. Drive Test Results.....	59
C. Stationary Test Results	70
VI. CONCLUSIONS.....	73
APPENDIX A – FORM 477 FILERS THAT SUBMITTED MF-II 4G LTE COVERAGE DATA	
APPENDIX B – ADDITIONAL FINDINGS FROM THE MF-II CHALLENGER DATA	
APPENDIX C – RESOURCES	

I. INTRODUCTION

1. Bridging the digital divide is the Federal Communications Commission’s top priority, and accurate broadband deployment data are critical to this mission. As part of the Commission’s ongoing effort to reform universal service funding of mobile wireless services and focus subsidies on unserved areas rather than on areas that already have service, the Commission unanimously adopted a new data collection of 4G Long-Term Evolution (LTE) mobile broadband coverage maps and a challenge process to determine areas eligible for support in the Mobility Fund Phase II (MF-II) auction. The largest mobile providers supported both this data collection and the challenge process. After mobile providers submitted coverage maps to the Commission and during the challenge process, some parties raised concerns regarding the accuracy of the maps submitted by providers. Based on these parties’ complaints and its own review of the record, staff became concerned that maps submitted by Verizon, U.S. Cellular, and T-Mobile overstated their coverage and thus were not accurate reflections of actual coverage.

2. Mobile providers are responsible for submitting accurate coverage maps in accordance with the Commission’s rules and orders. In response to these concerns and based upon a preliminary staff review of the challenger data, on December 7, 2018, the Commission launched an investigation into whether one or more major mobile providers violated the requirements of the one-time collection of coverage data. The investigation was led by the Rural Broadband Auctions Task Force in coordination with the Office of Economics and Analytics, Enforcement Bureau, Wireless Telecommunications Bureau, Wireline Competition Bureau, and the Office of Engineering and Technology. Commission staff initially requested information directly from several providers in order to understand providers’ mapping processes, and later issued subpoenas to Verizon and U.S. Cellular.

3. The Commission dispatched Enforcement Bureau field agents to conduct speed tests of the Verizon, U.S. Cellular, and T-Mobile networks. Commission field agents measured on-the-ground network performance in 12 states across six drive test routes,¹ conducting a total of 24,649 tests and driving nearly 10,000 miles in the course of this testing. Field agents also conducted 5,916 stationary speed tests at 42 distinct locations in nine states. Commission staff analyzed the speed test data from both the staff tests and MF-II challengers' speed tests and compared these test data with the maps submitted for the MF-II data collection as well as with maps providers had previously submitted to the Commission in other proceedings. This report documents the steps and processes undertaken by staff to investigate the coverage maps, analyzes speed tests taken by staff and submitted by challengers, and explains why discrepancies may exist between the submitted maps and actual coverage.

4. Through the investigation, staff discovered that the MF-II coverage maps submitted by Verizon, U.S. Cellular, and T-Mobile likely overstated each provider's actual coverage and did not reflect on-the-ground performance in many instances. Only 62.3% of staff drive tests achieved at least the minimum download speed predicted by the coverage maps—with U.S. Cellular achieving that speed in only 45.0% of such tests, T-Mobile in 63.2% of tests, and Verizon in 64.3% of tests. Similarly, staff stationary tests showed that each provider achieved sufficient download speeds meeting the minimum cell edge probability in fewer than half of all test locations (20 of 42 locations). In addition, staff was unable to obtain any 4G LTE signal for 38% of drive tests on U.S. Cellular's network, 21.3% of drive tests on T-Mobile's network, and 16.2% of drive tests on Verizon's network, despite each provider reporting coverage in the relevant area.

5. The Commission and the public must be able to rely on the deployment data that providers submit to the Commission. Inaccurate data jeopardize the ability of the Commission to focus our limited universal service funds on the unserved areas that need the most support. Accordingly, and considering the findings in this report, the Rural Broadband Auctions Task Force makes the following recommendations:

6. *First*, the Commission should terminate the MF-II Challenge Process. The MF-II coverage maps submitted by several providers are not a sufficiently reliable or accurate basis upon which to complete the challenge process as it was designed. The MF-II Challenge Process was designed to resolve coverage disputes regarding generally reliable maps; it was not designed to correct generally overstated coverage maps.

7. *Second*, the Commission should release an Enforcement Advisory on broadband deployment data submissions, including a detailing of the penalties associated with filings that violate federal law, both for the continuing FCC Form 477 filings and the new Digital Opportunity Data Collection. Overstating mobile broadband coverage misleads the public and can misallocate our limited universal service funds, and thus it must be met with meaningful consequences.

8. *Third*, the Commission should analyze and verify the technical mapping data submitted in the most recent Form 477 filings of Verizon, U.S. Cellular, and T-Mobile to determine whether they meet the Form 477 requirements. Staff recommends that the Commission assemble a team with the requisite expertise and resources to audit the accuracy of mobile broadband coverage maps submitted to the Commission. The Commission should further consider seeking appropriations from Congress to carry out drive testing, as appropriate. While Form 477 currently affords providers significant discretion in

¹ Although staff focused its testing on these six drive test routes in particular states, some tests were taken in neighboring states along several test routes. Specifically, a portion of tests were taken in Arizona on the New Mexico test route; in Kansas, New Mexico, and Texas on the Oklahoma test route; in Wyoming and North Dakota on the Montana test route; and in Massachusetts and New Hampshire on the Vermont test route. Tests on the Alabama and Arizona drive test routes were taken entirely within those states.

determining the extent of their mobile broadband coverage, this discretion does not encompass reporting inaccurate mobile coverage across extended areas in which consumers cannot receive any wireless signal whatsoever.

9. *Fourth*, the Commission should adopt policies, procedures, and standards in the Digital Opportunity Data Collection rulemaking and elsewhere that allow for submission, verification, and timely publication of mobile broadband coverage data. Mobile broadband coverage data specifications should include, among other parameters, minimum reference signal received power (RSRP) and/or minimum downlink and uplink speeds, standard cell loading factors and cell edge coverage probabilities, maximum terrain and clutter bin sizes, and standard fading statistics. Providers should be required to submit actual on-the-ground evidence of network performance (e.g., speed test measurement samplings, including targeted drive test and stationary test data) that validate the propagation model used to generate the coverage maps. The Commission should consider requiring that providers assume the minimum values for any additional parameters that would be necessary to accurately determine the area where a handset should achieve download and upload speeds no less than the minimum throughput requirement for any modeling that includes such a requirement.

10. Because detailed information on propagation model parameters and deployed infrastructure is necessary to fully verify the engineering assumptions inherent in mobile coverage data, the Commission should collect specific information used in the models, including the locations and specific characteristics of certain cell sites used for mobile wireless service, the modeling software used, the entire link budget, the sources of terrain and clutter data, and clutter values. The Commission should require engineering certifications of mobile broadband deployment data submissions. And the Commission should convene a workshop of stakeholders on best practices for the generation and submission of accurate mobile broadband deployment data including speed testing methodologies.

II. BACKGROUND

11. The Commission relies upon coverage maps submitted by providers in accordance with data collection rules and specifications adopted through notice and comment rulemakings. For almost two decades, the Commission has relied on FCC Form 477 to collect data on mobile services. In 2000, when the Commission first established the form, the Commission focused on subscription data at a broad level, envisioning that the data collected would help it better assess the availability of broadband services, such as high-speed Internet access service, and the development of competition for telephone service.² A decade later, the Commission recognized that such a high-level data collection, focused on subscriptions, was insufficient. Accordingly, in conjunction with reforms to reorient the Universal Service Fund toward supporting broadband deployment,³ the Commission revised Form 477 to collect data on deployments at a granular level: census blocks for fixed services and the boundaries of coverage areas for mobile services.⁴

12. The Commission adopted a framework for an MF-II auction to focus our limited universal service funds to the areas most in need of support.⁵ The Commission defined the eligible areas

² *Local Competition and Broadband Reporting*, Report and Order, 15 FCC Rcd 7717, 7718, 7719, 7752-53, paras. 1, 3, 69-72 (2000).

³ *Connect America Fund et al.*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, 17682 (2011) (*USF/ICC Transformation Order*).

⁴ *Modernizing the FCC Form 477 Data Program*, Report and Order, 28 FCC Rcd 9887 (2013).

⁵ *Connect America Fund; Universal Service Reform – Mobility Fund*, Report and Order and Further Notice of Proposed Rulemaking, 32 FCC Rcd 2152, 2157-88, paras. 16-83 (2017) (*MF-II Report & Order*).

VI. CONCLUSIONS

73. Accurate broadband data is essential to bridging the digital divide, and bridging the digital divide is the Commission's top priority. Mobile providers are legally responsible for submitting accurate and reliable coverage maps to the Commission. It is incumbent upon mobile providers to accurately model their networks, to test and retest these models, and to improve continually the accuracy of their projections so that their submissions can be confidently relied upon by the Commission, USAC, and the public.¹²³

74. Our analysis and speed tests suggest that the submitted MF-II coverage maps did not match actual coverage in many instances. Accordingly, the Commission has sought comment in another proceeding on how it can improve the reliability of the data submitted by mobile service providers.¹²⁴ This staff report documents the extensive efforts of staff to investigate the coverage maps submitted by providers for the MF-II data collection and, in doing so, to provide insights into potential ways the Commission can improve the accuracy of mobile coverage going forward.

75. Specifically, staff recommends that the Commission terminate the MF-II challenge process. Despite the extensive efforts of staff and challengers that contributed to the challenge process, the submitted coverage maps are not a sufficiently accurate basis upon which to continue a process meant to address coverage disputes at the margins. The challenge process was not designed to correct generally overstated coverage maps.

76. Staff recommends that the Commission issue an Enforcement Advisory on broadband data accuracy in the Form 477 filing, and, separately, for future Digital Opportunity Data Collection filings. Broadband data accuracy should be made a top priority going forward and providers should be put on notice of the penalties that could arise from coverage filings that violate federal law.

77. Staff recommends that the Commission assemble a team with the requisite expertise, resources, and capacity to audit, verify, and investigate the accuracy of mobile broadband coverage maps submitted to the Commission. The Commission should further consider seeking appropriations from Congress to carry out any necessary drive testing. This team should specifically analyze the most recent Form 477 filings of Verizon, U.S. Cellular, and T-Mobile to determine if they complied with the Form 477 requirements. The Form 477 rules prohibit providers from reporting coverage where they provide none.

78. Additionally, staff recommends that the Commission adopt several changes in its mobile data collections. For MF-II, the Commission adopted the most granular and standardized mobile coverage collection it had ever undertaken. The staff analysis in this report, and the staff and challenger speed tests upon which the analysis relies, are an unprecedented examination into how accurately the coverage maps submitted by mobile providers to the Commission reflect on-the-ground, consumer experiences. This analysis indicates that the coverage data submitted by several providers did not accurately reflect actual on-the-ground coverage in many cases, and thus indicates that our mobile data coverage collections should become more standardized, more detailed, and include actual speed test data. Providers should submit more than just projections of coverage; providers should be required to submit actual speed test data sampling that verifies the accuracy of their propagation models. The Commission should adopt policies, procedures, and standards that allow for submission, verification, and disclosure of

¹²³ The Commission requires truthful and accurate statements in its proceedings. *See, e.g.*, 47 CFR § 1.17(a)(1).

¹²⁴ *See, e.g., Establishing the Digital Opportunity Data Collection; Modernizing the FCC Form 477 Data Program*, Report and Order and Second Further Notice of Proposed Rulemaking, 34 FCC Rcd 7505, 7549-52, paras. 112-20 (2019) (proposing to require mobile service providers to submit "infrastructure information sufficient to allow for verification of the accuracy of providers' broadband data" upon request).

mobile coverage data and also convene a workshop of stakeholders on best practices for the generation and submission of accurate mobile broadband data.

79. Staff is unable to determine the specific reasons for every difference between providers' model-predicted and on-the-ground coverage. Our speed testing, data analyses, and inquiries, however, suggest that some of these differences may be the result of some providers' models: (1) using a cell edge RSRP value that was too low, (2) not adequately accounting for network infrastructure constraints, including backhaul type and capacity, or (3) not adequately modeling certain on-the-ground factors—such as the local clutter, terrain, and propagation characteristics by spectrum band for the areas claimed to be covered.

80. For proceedings in which the Commission collects mobile broadband deployment data, staff recommends that the Commission standardize the propagation map parameters and assumptions that providers use to generate their coverage data. The propagation map parameters adopted in the *MF-II Challenge Process Order*, as well as the coverage and other data required by that Order, should serve as the starting point, but key elements could be further standardized to determine more accurately where consumers can expect to obtain a mobile broadband connection.¹²⁵ Based on what we have learned from this process, in the future the Commission should be able to obtain more accurate mobile coverage data by specifying additional technical parameters. Specifically, the Commission should adopt mobile broadband coverage data specifications that include, among other things, minimum throughput and/or signal strength (as appropriate), standard cell loading factors and cell edge probabilities, maximum terrain and clutter bin sizes, and standard fading statistics. For any modeling with minimum throughput parameters, the Commission should require that providers assume the minimum values for whatever additional propagation model parameters would be necessary in order to accurately determine the area where a handset is demonstrated to achieve performance with download and upload speeds no less than the requirement meeting the cell edge probability. The Commission should allow for refinements of propagation models based on experience in any given area but should not allow elimination of elements such as clutter and fading that play a major role in the likelihood of connectivity. Additionally, all data submissions should require an engineering certification.¹²⁶

81. The Commission should collect additional, more detailed data from mobile providers on the inputs and assumptions that underlie their propagation models, including the locations and specific characteristics of certain cell sites used for mobile wireless service, the modeling software that is being used, the entire link budget and values, and terrain data source.¹²⁷ To ensure the integrity and reliability of submitted maps, the Commission should also require that all filers submit sufficient actual speed test data sampling that verifies the accuracy of the propagation model used to generate the coverage maps. Actual speed test data is critical to validating the models used to generate the maps.

82. Although a challenge process may seem capable of correcting inaccurate coverage maps, we caution that, as with coverage projections based on propagation models, there are inherent limits to

¹²⁵ Standardization should be implemented as appropriate for the purposes of the coverage data collection, taking into account relevant variations, for example in terrain.

¹²⁶ We understand that mobile providers closely monitor the performance of their networks including data that can provide insight as to whether service is actually available in an area. We note that the tests conducted for this project found there was no connectivity at all in many areas. We expect that providers should be aware of this from monitoring their networks or their own field tests.

¹²⁷ The Commission should adopt procedures for providers that use modeling programs that rely upon proprietary information, e.g., clutter loss values, that would allow for such providers to disclose information necessary to validate their model assumptions. The Commission should consider requiring submission of traffic models to validate the relevant assumptions.

how accurately individual speed tests reflect network performance because performance on mobile broadband networks is inherently variable. Managing a granular challenge process is highly time- and resource intensive and may not significantly improve the accuracy of the underlying maps. Accordingly, staff does not recommend adoption of granular mobile challenge processes as a means of improving the accuracy of mobile coverage maps. This recommendation is separate and aside from creating processes for stakeholders to provide the Commission with evidence that challenges the mapping and modeling assumptions of mobile providers, thus enabling the Commission to respond to evidence of generalized problems with submitted coverage maps, and thus increasing the legitimacy of a final assessment of coverage. While adoption of these staff recommendations should lead to improvements in the Commission's data collection processes, enforcement of data collection rules, and the accuracy of submitted data, mobile providers are ultimately responsible for the accuracy of the coverage data they file.



H. Rept. 116-349 - MAPPING ACCURACY PROMOTES SERVICES ACT

116th Congress (2019-2020)

Report Type: House Report
Accompanies: [H.R.4227](#)
Committees: [House Energy and Commerce Committee](#)

Report text available as: TXT | [PDF](#) (PDF provides a complete and accurate display of this text.) ?

116th Congress }

HOUSE OF REPRESENTATIVES

{ Report

1st Session }

{ 116-349

MAPPING ACCURACY PROMOTES SERVICES ACT

December 16, 2019.--Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. Pallone, from the Committee on Energy and Commerce, submitted the following

R E P O R T

[To accompany H.R. 4227]

The Committee on Energy and Commerce, to whom was referred the bill (H.R. 4227) to prohibit the submission to the Federal Communications Commission of broadband internet access service coverage information or data for the purposes of compiling an inaccurate broadband coverage map, having considered the same, report favorably thereon without amendment and recommend that the bill do pass.

CONTENTS

	Page
I. Purpose and Summary.....	1
II. Background and Need for Legislation.....	2
III. Committee Hearings.....	2
IV. Committee Consideration.....	3
V. Committee Votes.....	3
VI. Oversight Findings.....	3
VII. New Budget Authority, Entitlement Authority, and Tax Expenditures	3
VIII. Federal Mandates Statement.....	3

IX. Statement of General Performance Goals and Objectives.....4

 X. Duplication of Federal Programs.....4

XI. Committee Cost Estimate.....4

XII. Earmarks, Limited Tax Benefits, and Limited Tariff Benefits.....4

XIII. Advisory Committee Statement.....4

XIV. Applicability to Legislative Branch.....4

 XV. Section-by-Section Analysis of the Legislation.....4

XVI. Changes in Existing Law Made by the Bill, as Reported.....5

I. PURPOSE AND SUMMARY

H.R. 4227, the Mapping Accuracy Promotes Services Act'' or ``MAPS Act'', was introduced on September 6, 2019, by Reps. McEachin (D-VA), Long (R-MO), Loeb sack (D-IA), and Latta (R-OH), and referred to the Committee on Energy and Commerce. To ensure that the Federal Communications Commission (FCC or Commission) and the public have access to accurate and granular information regarding the availability of broadband, the MAPS Act specifies that it is unlawful for a person to willfully, knowingly, or recklessly submit inaccurate information about the availability or quality of service of broadband.

II. BACKGROUND AND NEED FOR LEGISLATION

The FCC began collecting subscription and connection data for broadband and telephone service using Form 477 in 2000.\1\ Since then, these data have become the primary source for many FCC actions, including its publication of statutorily mandated reports to Congress regarding competition among certain service providers, and the availability of advanced communications capability.\2\ The FCC has also used these data to update its universal service policies, including by excluding certain areas from receiving support.\3\

\1\See Federal Communications Commission, Establishing the Digital Opportunity Data Collection, Modernizing the FCC Form 477 Data Program, Report and Order and Second Notice of Proposed Rulemaking, WC Docket No. 19-195 and WC Docket No. 11-10, at para.5 (rel. Aug. 6, 2019) (hereinafter ``FCC Broadband Mapping Order'').

\2\Id.

\3\Id. at para.8.

In recent years, the FCC's efforts at mapping the availability of broadband internet access service have been widely criticized. A key part of the failures of the Commission's mapping process relates to inaccurately submitted data. In December of 2018, the FCC opened an investigation into whether one or more major carriers violated the Mobility Fund Phase II reverse auction's mapping rules by submitting inaccurate mapping data,\4\ and in May of 2019, one company erroneously claimed to be serving millions more people than it was in fact serving.\5\

\4\Federal Communications Commission, FCC Launches Investigation into Potential Violations of Mobility Fund Phase II Mapping Rules, Press Release (Dec. 7, 2018).

\5\Federal Communications Commission, Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, Statement of Commissioner Geoffrey Starks, GN Docket No. 18-238, at 327 (rel. May 29, 2019).

III. COMMITTEE HEARINGS

For the purposes of section 103(i) of H. Res. 6 of the 116th Congress, the following hearing was used to develop or consider H.R. 4227:

The Subcommittee on Communications and Technology held a legislative hearing on September 11, 2019, entitled ``Legislating to Connect America: Improving the Nation's Broadband Maps.'' The Subcommittee received testimony from the following witnesses:

James M. Assey, Executive Vice President,
NCTA--The Internet & Television Association;
Shirley Bloomfield, Chief Executive Officer,
NTCA--The Rural Broadband Association;
Dana J. Floberg, Policy Manager, Free Press
& Free Press Action;
Jonathan Spalter, President and CEO, US
Telecom Association;
Grant Spellmeyer, Vice President, Federal
Affairs & Public Policy, U.S. Cellular; and
James W. Stegeman, President/CEO, CostQuest
Associates.

IV. COMMITTEE CONSIDERATION

H.R. 4227, the ``Mapping Accuracy Promotes Services Act'' or ``MAPS Act'', was introduced on September 6, 2019, by Reps. McEachin (D-VA), Long (R-MO), Loeb sack (D-IA), and Latta (R-OH), and referred to the Committee on Energy and Commerce. The bill was subsequently referred to the Subcommittee on Communications and Technology on September 7, 2019. Following a legislative hearing, on November 14, 2019, the Subcommittee met in open markup session, pursuant to notice, for consideration of H.R. 4227. No amendments were offered during Subcommittee consideration. Subsequently, the Subcommittee on Communications and Technology agreed to a motion by Mr. Doyle, Chairman of the subcommittee, to forward H.R. 4227 favorably to the full Committee, without amendment, by voice vote.

On November 20, 2019, the full Committee on Energy and Commerce met in open markup session, pursuant to notice, to consider H.R. 4227. During consideration of the bill, no amendments were offered. Subsequently, the full Committee agreed to a motion by Mr. Pallone, Chairman of the committee, to order H.R. 4227 reported favorably to the House, without amendment, by a voice vote, a quorum being present.

V. COMMITTEE VOTES

Clause 3(b) of rule XIII of the Rules of the House of Representatives requires the Committee to list each record vote on the motion to report legislation and amendments thereto. The Committee advises that there were no record votes taken on H.R. 4227, including the motion on final passage by Mr. Pallone on the bill.

VI. OVERSIGHT FINDINGS

Pursuant to clause 3(c)(1) of rule XIII and clause 2(b)(1) of rule X of the Rules of the House of Representatives, the oversight findings and recommendations of the committee are reflected in the descriptive portion of the report.

VII. NEW BUDGET AUTHORITY, ENTITLEMENT AUTHORITY, AND TAX EXPENDITURES

Pursuant to 3(c)(2) of rule XIII of the Rules of the House of Representatives, the Committee adopts as its own the

estimate of new budget authority, entitlement authority, or tax expenditures or revenues contained in the cost estimate prepared by the Director of the Congressional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974.

The Committee has requested but not received from the Director of the Congressional Budget Office a statement as to whether this bill contains any new budget authority, spending authority, credit authority, or an increase or decrease in revenues or tax expenditures.

VIII. FEDERAL MANDATES STATEMENT

The Committee adopts as its own the estimate of Federal mandates prepared by the Director of the Congressional Budget Office pursuant to section 423 of the Unfunded Mandates Reform Act.

IX. STATEMENT OF GENERAL PERFORMANCE GOALS AND OBJECTIVES

Pursuant to clause 3(c)(4) of rule XIII, the general performance goal or objective of this legislation is to make it unlawful for any person to submit inaccurate broadband availability or quality of service data willfully, knowingly, or recklessly.

X. DUPLICATION OF FEDERAL PROGRAMS

Pursuant to clause 3(c)(5) of rule XIII, no provision of H.R. 4227 is known to be duplicative of another Federal program, including any program that was included in a report to Congress pursuant to section 21 of Public Law 111-139 or the most recent Catalog of Federal Domestic Assistance.

XI. COMMITTEE COST ESTIMATE

Pursuant to clause 3(d)(1) of rule XIII, the Committee adopts as its own the cost estimate prepared by the Director of the Congressional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974.

XII. EARMARKS, LIMITED TAX BENEFITS, AND LIMITED TARIFF BENEFITS

Pursuant to clause 9(e), 9(f), and 9(g) of rule XXI, the Committee finds that H.R. 4227 contains no earmarks, limited tax benefits, or limited tariff benefits.

XIII. ADVISORY COMMITTEE STATEMENT

The legislation does not create any new Federal advisory committee within the meaning of section 5(b) of the Federal Advisory Committee Act.

XIV. APPLICABILITY TO LEGISLATIVE BRANCH

The Committee finds that the legislation does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act.

XV. SECTION-BY-SECTION ANALYSIS OF THE LEGISLATION

Section 1. Short title

Section 1 designates that the short title may be cited as

the ``Mapping Accuracy Promotes Services Act'' or ``MAPS Act''.

Sec. 2. Definitions

Section 2 provides definitions for the terms ``broadband internet access service'', ``Commission'', ``provider'', and ``quality of service''.

Sec. 3. Enforcement

Section 3 specifies that it is unlawful for a person to willfully, knowingly, or recklessly submit inaccurate information about the availability or quality of service of broadband. The Committee recognizes that information and data submitted by providers may contain minor mistakes. Therefore, the standard set forth in this provision, including the word ``recklessly'', is not intended to apply to providers who submit information that contains unintentional errors, minor mistakes, small omissions, and small overstatements. Instead, the focus is on materially inaccurate information that will have a significant impact on the Commission's collection and use of the information and data under this Act.

XVI. CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

There are no changes to existing law made by the bill H.R. 4227.

[all]

116TH CONGRESS
1ST SESSION

H. R. 4227

To prohibit the submission to the Federal Communications Commission of broadband internet access service coverage information or data for the purposes of compiling an inaccurate broadband coverage map.

IN THE HOUSE OF REPRESENTATIVES

SEPTEMBER 6, 2019

Mr. MCEACHIN (for himself, Mr. LONG, Mr. LOEBSACK, and Mr. LATTA) introduced the following bill; which was referred to the Committee on Energy and Commerce

A BILL

To prohibit the submission to the Federal Communications Commission of broadband internet access service coverage information or data for the purposes of compiling an inaccurate broadband coverage map.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Mapping Accuracy
5 Promotes Services Act” or the “MAPS Act”.

6 **SEC. 2. DEFINITIONS.**

7 In this Act:

1 (1) BROADBAND INTERNET ACCESS SERVICE.—

2 The term “broadband internet access service” has
3 the meaning given the term in section 8.1(b) of title
4 47, Code of Federal Regulations, or any successor
5 regulation.

6 (2) COMMISSION.—The term “Commission”
7 means the Federal Communications Commission.

8 (3) PROVIDER.—The term “provider” means a
9 provider of fixed or mobile broadband internet access
10 service.

11 (4) QUALITY OF SERVICE.—The term “quality
12 of service” means information regarding offered
13 download and upload speeds and latency of a pro-
14 vider’s broadband internet access service as deter-
15 mined by and to the extent otherwise collected by
16 the Commission.

17 **SEC. 3. ENFORCEMENT.**

18 (a) IN GENERAL.—It shall be unlawful for a person
19 to willfully, knowingly, or recklessly submit broadband
20 internet access service coverage information or data to the
21 Commission for the purposes of compiling a broadband
22 coverage map that is inaccurate with respect to the avail-
23 ability or quality of service of broadband internet access
24 service.

1 (b) PENALTY.—Any person who violates subsection
2 (a) shall be subject to an appropriate penalty, as deter-
3 mined by the Commission, under—

4 (1) the Communications Act of 1934 (47
5 U.S.C. 151 et seq.), including section 501 of that
6 Act (47 U.S.C. 501); and

7 (2) the rules of the Commission.

8 (c) EFFECTIVE DATE.—

9 (1) IN GENERAL.—Except as provided in para-
10 graph (2), subsection (a) shall apply with respect to
11 broadband internet access service coverage informa-
12 tion or data that is submitted to the Commission on
13 or after the date of the enactment of this Act.

14 (2) QUALITY OF SERVICE INFORMATION OR
15 DATA.—To the extent broadband internet access
16 service coverage information or data relates to qual-
17 ity of service, subsection (a) shall apply with respect
18 to information or data that is submitted on or after
19 the date that is 180 days after the date of the enact-
20 ment of this Act.

○



[WHAT WE DO](#) ▾ [WHO WE SERVE](#) ▾ [ASK US ANYTHING](#) ▾ [ABOUT US](#) ▾ [CONTACT US](#)

We Assessed the Accuracy of Wireless Coverage Maps per Carrier, and the Results Disappoint

It's been a dozen years since Verizon's catchphrase "Can you hear me now?" became a commonplace precept for any mobile phone user having problems with a cellular connection. Since then, there has been a tremendous amount of industry activity regarding partnerships, mergers, acquisitions and dissolutions amongst wireless service providers. Today, there are now three major players in the U.S.; sometimes known as the "Big Three" Verizon, AT&T, and T-Mobile (who acquired Sprint) are the survivors who have staked claims to national airwaves and their respective licensed markets of POPs.

Since competition for subscribers remains at the forefront of Big 3 marketing strategies, and "anytime, anywhere" fast and reliable coverage is a benefit to many people, the major carriers publish

- (877) 428-6937
- Newsletter
- Ask Sita Experts

Search ... 

CATEGORIES

- Wireless Lease Negotiations & Valuation
 - Lease Rates and Lease Valuation
 - Lease Buyouts
 - Small Cell and DAS Management

network coverage maps on their websites, in an effort to persuade customers to churn their way. In the last two years, it's become a matter of growing concern for some politicians who have taken the issue of accurate network coverage on as a rallying cry. Sen. Charles Schumer, D-NY, asked the FCC to investigate whether network providers are fairly and accurately advertising wireless coverage in their online coverage map tools.

CALL FOR BETTER COVERAGE MAPS

Sign up to receive in-depth wireless analysis, news, trends, and reports.

- ☐ Landowners
- ☐ Tower Owners
- ☐ Industry Experts
- ☐ Investors

**Please select only one out the following four groups so we can send you content specifically tailored to your interest.*

Subscribe

The FCC has been calling for better coverage maps (at the bequest of Congress) and has initiated a surprisingly aggressive attack on carrier coverage maps. However, the carriers are fighting back, saying that [having to produce reliable coverage](#)

- Tenant Collocation and Subleasing
- Cell Tower Maps and Locations
- Cell Tower Valuation and Brokerage
- Equipment Modifications & Lease Renegotiations
- New Wireless Telecom Leases
- Lease Extensions and Expirations
- Lease Terminations
- Best Practices for Landowners, Government Entities & Venue Owners
 - Counties, Municipalities and Public Entities
 - Schools
 - Business and Venue

maps would be overly expensive due to the cost of drive testing. They allege that it would cost tens of millions per year to test just part of their coverage maps. (Ignoring the obvious possibilities that there are companies that already do nationwide drive testing who could drive the entire country for all wireless carriers simultaneously- thereby reducing the cost per carrier).

According to a study conducted by RootMetrics, Hudson Valley, NY ranks 125th out of 125 metropolitan areas for good coverage and capacity on the BIG 4 wireless networks. Now, it is important to acknowledge that many factors are contributing to strong wireless coverage and network capacity in a metropolitan area, some of which are completely outside of the WSP's purview. For example, one factor is the willingness of local municipalities to allow wireless infrastructure, such as new tower builds. Under the Telecommunications Act of 1996, local municipalities could no longer prohibit the provision of wireless service. However, they sure can make it difficult. And in Hudson Valley, NY, zoning regulations do exactly that. Thus, it may not be AT&T, Sprint, T-Mobile or Verizon's fault that coverage is poor in the Hudson Valley area. It isn't for a lack of trying, as they get turned down in zoning hearings for new towers and wireless infrastructure on a regular basis. However, that doesn't excuse them from inaccurately depicting strong coverage on their website coverage maps for that area.

Owners

- o Churches
- o Private

Landowners

- o Cell Tower Builds & Wireless Technology

- o 5G
- o Backhaul and Fiber Optics
- o Wireless Devices
- o Cell Towers and Safety
- o Cell Tower and Cell Site Development
- o Spectrum and Policy
- o LTE Deployment
- o Subscribers and Data Demand
- o Wi-Fi & Wireless Devices
- o HetNet in the News

- o Wireless Infrastructure Industry Players

Here at Steel in the Air, Inc., we review coverage maps for each of the wireless carriers on a daily basis, while acting as a cell tower lease expert that advises landowners of the fair-market value of leases. Part of our assessments involve a location metric, which enables us to determine the relative value of a particular location for each of the Big Three carriers, in consideration of their current operational infrastructure. Each year, my staff and I review thousands of locations and visit each wireless provider's coverage map website for each newly proposed cell site location. Coverage maps are generated by either the marketing department or the radio frequency department, and are intended to fulfill specific purposes. In my opinion, both AT&T and Verizon have antiquated website coverage mapping tools that simply show equal coverage across large areas. While both AT&T and Verizon do have better coverage empirically (RootMetrics ranks them #1 and #2 across the United States), their coverage maps are simple marketing tools intended to convince viewers that coverage and capacity exists ubiquitously across a large area. T-Mobile recently (Aug-2020) reduced the quality of their coverage map in our opinion. Sprint (now part of T-Mobile) previously had more realistic coverage maps that show actual gradients in quality of coverage and more closely represent realistic conditions.

To illustrate, please see the image pair below. On the left is an image of Verizon's coverage map

- Cell Tower Companies in the News
- Wireless Carriers in the News
- Lease Buyout Companies in the News
- Lease Optimization Companies
- Wireless Industry Market Dynamics
- Steel in the Air News
- Uncategorized

ARCHIVES

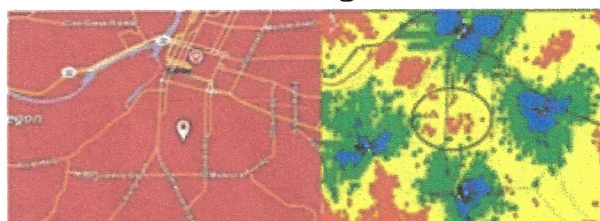
Select Month ▼

TAGS

5G
American Tower
AT&T at&t map
Black Dot C-RAN
capex CCI

depicting coverage strength in a given area. On the right is a coverage map that Verizon's radio frequency department generated to support their efforts to get a new tower approved at the circled in the middle of the map. In order to get zoning approval to build a new tower, Verizon must demonstrate that its coverage is currently sub-par at that location. The blue areas represent strong coverage while the yellow areas represent weak to none. Again, the red map is what Verizon has published on its website illustrating the exact same area; and

here it shows red



(strong coverage) across the entire area. Is Verizon's online coverage map wrong or is the map to the right understated simply to fool the zoning board into agreeing to a new tower build? In reality, both are correct. Verizon, just like other wireless carriers shows coverage on their website to market how strong it is but understates it when required to prove the need for a new tower. In other words, Verizon (and other wireless carriers) can generate coverage maps to show whatever they want to show.

We previously gave T-Mobile credit for attempting to provide more actionable information with their coverage maps. In early 2015, T-Mobile's coverage map was updated. The result was similar to AT&T and Verizon's coverage map tools whereby most areas of the country were shown with excellent

cell site lease
cell towers
Cincinnati Bell
Clearwire
Comcast
Crown Castle
DAS Densify
Earnings Calls
Extenet FCC
Lease Extensions
and Expirations
Lease
Renegotiation
LTE-U macrocells
Md7 Mobilitie
MVNO
Net Neutrality
network coverage
Network
Optimization
Orlando overhaul
pole top SBA
SBA
Communications
small cell
Small Cell Policy
Small Cells Sprint
sprint map
T-Mobile
t-mobile map
Tower company
Verizon
verizon map

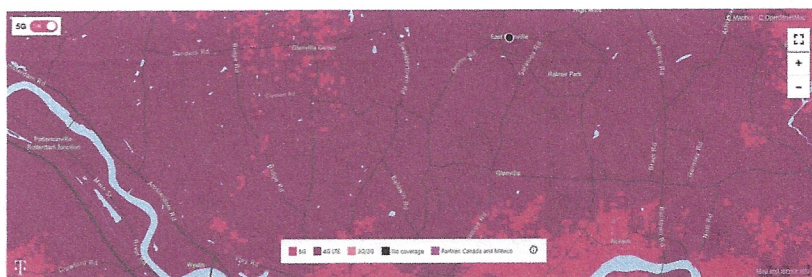


Wireless Capital
Partners

coverage. However, at some point in November of 2015, T-Mobile revised what their coverage maps showed to present more realistic results. To the right is a pair of images that illustrate coverage over the same area as shown on T-Mobile's website on two different dates. The first, taken from June 18th of 2015, shows nearly complete strong coverage over the entire area. The second taken from November 15th of 2015 shows a different picture with pockets of strong coverage and some areas of weaker coverage. The latter map is much more representative of what T-Mobile's coverage actually is, not what the marketing department wants to show it as. It appears that T-Mobile rightfully determined that they were overstating actual coverage and revised their map to more accurately show real coverage.

However, in August 2020, T-Mobile revised its coverage map yet again. The map now shows 5G availability but without any indication of the type of 5G that is available or the quality/speed of that 5G. T-Mobile is now running 5G on three sets of spectrum: mmWave (fastest), 2.5GHz from Sprint (fast), and 600MHz (slower).

Although the maps now shown 5G availability, their 4G (dark maroon) maps may have been deprecated as the maps appear to show more universally available coverage in the same areas as before. This could be because they now have the Sprint sites and spectrum, but I tend to doubt it as it is unlikely that these areas have had Sprint sites converted to T-Mobile equipment yet. We suspect that T-Mobile made the decision to follow AT&T and Verizon's lead and just show solid 4G coverage everywhere. Below is a August 24, 2020 coverage map showing the same area as in the T-Mobile coverage areas above. T-Mobile no longer shows "Excellent, Good or Average" coverage levels on their 4G map.



Coverage Map Accuracy

So you might ask "how would you rate the accuracy of the coverage maps by the Big 3 wireless carriers in terms of accuracy of actual coverage?" Here are our independent ratings of the quality of the coverage maps. It might be helpful to the reader to know that we maintain one of the best, if not the best, database of cell tower location data and lease rate data in the country. When we review the coverage maps, we also have the benefit of knowing where the towers are in the

same area and, in many cases, which wireless carriers are located on which towers. We also know when there are no towers in an area where the wireless carrier may be stating (or exaggerating) that they have coverage. Below are our coverage map ratings based upon accuracy (the probability that the stated coverage accurately shows the actual coverage); ease of use (how easy is it to find the coverage map and use it); underlying map detail (how complete is the underlying road and map features; Ability to Select Device (does the website allow you to choose the device to see whether it has better/worse coverage); and Verified Coverage (does the map show you actual use that has been submitted by the phones using the network.)

	Accuracy	Ease of Use	Underlying Map	Ability to Select Device	5G Coverage
T-Mobile	6	7	Moderate	No	Simple
Sprint (now T-Mobile)	8	6	Detailed	Yes	Simple
Verizon	6	8	Simple	No	Separate Detailed Maps per City

AT&T	5	7	Simple	No	Simple
------	---	---	--------	----	--------

it is important to note that good coverage doesn't always mean good performance, nor does it mean a fast data connection. Furthermore, the maps typically show what coverage is like outdoors, not indoors. Thus, even with accurate maps, your cellular and data performance may suffer when you go indoors. Lastly, in terms of total actual coverage across the US, Verizon and AT&T simply have more complete and extensive coverage although T-Mobile is quickly catching up with their 600MHz expansion over the last 2 years. So if you travel a significant amount, especially in smaller towns or rural areas, go with Verizon for reliable coverage. However, if you pretty much work in one place and live in another, the accuracy of site-specific coverage maps is more important.

It is also important that while the maps may show strong vs. weak coverage, none of the maps show the amount of capacity that the network has at a given location. Accordingly, while there may be excellent coverage at a location, if there are too many people using the network simultaneously (think AT&T's network in NYC after the first iPhone came out) the data speeds will drop and connectivity will become more problematic. In other words, at this point in time, none of the maps accurately show network capacity, although areas with 5G coverage will be more likely to handle greater capacity. However, that doesn't necessarily mean faster speeds. ([See this](#)

comparison by Open Signal– T-Mobile easily has the widest 5G coverage area- but Verizon's average speed across their network is still higher even with the lowest 5G availability.)

So what can the average wireless consumer take from this?

1. Wireless carrier coverage maps should only be used as a starting place. Do not decide which carrier to subscribe to based solely on coverage maps.
2. Test your phone in your office and home before committing to a long-term agreement. Each of the WSPs allows a specific amount of time to return the phone after the date of purchase and cancel the service (usually 30 days). Ask your carrier about this prior to committing.
3. Consumer Reports, RootMetrics, and PC Magazine have conducted independent studies on each of the Big 4 using empirical data to determine the quality and speed of service. Ranked results often show carrier performance by city and/ or geographical location.
4. There are multiple sources that purport to provide crowd-gathered wireless coverage maps. These include www.opensignal.com and www.sensorly.com. While these maps can be helpful in confirming strong coverage, the lack of strong coverage could simply mean that the website didn't receive adequate data to determine strong coverage. Thus, false negatives may apply.

5. Do not rely upon 5G coverage maps as an indication of how fast your 5G service will be at a specific location. Other than Verizon's 5G maps (which are hard to find and access) which show only mmWave 5G (the fastest type), the other carriers are blending 5G on their maps to include all types of 5G including low band (slowest 5G), mid-band (moderate 5G), and mmWave (fastest 5G).

Feel free to let us know if you have any comments or comments!

8





[verizon map](#) [at&t map](#) [sprint map](#) [t-mobile map](#)
[network coverage](#)

[« Previous Post](#)

Towers and Tenant
Collocation Rent
Trends: 2016-Beyond

[Next Post »](#)

Key Takeaways from
Crown Castle (CCI)
2015 4th Quarter
Earnings Call

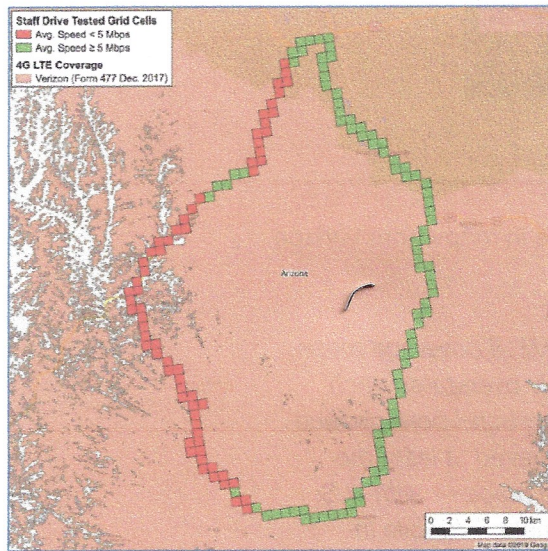
 January 25, 2016  Ken Schmidt  Wireless
Carriers in the News, Wireless Infrastructure Industry Players,
Cell Tower Maps and Locations, Subscribers and Data
Demand  19 comments

19 COMMENTS

December 10, 2019 in [Protecting Public Airwaves](#)

New FCC Report Shows that Wireless Carriers Exaggerate Coverage

SHARE



FCC staff determined that Verizon-submitted coverage maps were inaccurate over 35% of the time. Source: FCC

On December 4, the FCC made a [major announcement](#) that the Commission would repurpose \$9 billion to fund 5G deployment in rural America. So where exactly would the money go? Buried in the press release were the findings of a [year-long investigation](#) into the accuracy of cell phone network coverage maps.

Mapping is important for both fixed and mobile service providers because these companies cannot receive federal subsidies for areas that are already

served by another competitor. By overstating coverage incumbent providers can prevent competitors from receiving public subsidies to compete. [In an earlier post](#), we wrote about how fixed broadband maps were wildly inaccurate.

For years, wireless customers have complained about coverage. Maps from the largest wireless companies would show strong coverage, but in reality, users would have no signal. As a result of continuous complaints from consumers, companies and Congress, the FCC unanimously adopted a new data collection method for 4G LTE coverage maps. It also established a process to allow the public to submit its own data when coverage did not deliver as promised.

Last December, the FCC became suspicious that maps submitted by Verizon, U.S. Cellular and T-Mobile were possibly inaccurate. Challenger speed tests showed that up to 23% of areas that carriers claimed had 5 Mbps wireless coverage performed well below that.

As a result of this suspicion, the FCC Enforcement Bureau conducted extensive testing of 24,649 on-the-ground network performance tests in 12 states and 5,916 stationary speed tests at 42 distinct locations in nine states.

Table 3. Staff Drive Test Results by Provider

Provider Name	Test Count Zero Mbps	Test Count > 0 & < 5 Mbps	Test Count ≥ 5 Mbps	Test Count Total	Percentage ≥ 5 Mbps
Verizon	2,717	3,094	10,487	16,298	64.3%
U.S. Cellular	654	587	1,015	2,256	45.0%
T-Mobile	1,258	986	3,851	6,095	63.2%
Total	4,629	4,667	15,353	24,649	62.3%

Source: FCC

The key finding of the report shows serious inaccuracies in maps from Verizon, U.S. Cellular and T-Mobile.

“Through the investigation, staff discovered that the MF-II coverage maps submitted by Verizon, U.S. Cellular, and T-Mobile likely overstated each provider’s actual coverage and did not reflect on-the-ground performance in many instances. Only 62.3% of staff drive tests achieved at least the minimum download speed predicted by the coverage maps — with U.S. Cellular achieving that speed in only 45.0% of such tests, T-Mobile in 63.2% of tests, and Verizon in 64.3% of tests. Similarly, staff stationary tests showed that each provider achieved sufficient download speeds meeting the minimum cell edge probability in fewer than half of all test locations (20 of 42 locations). In addition, staff was unable to obtain any 4G LTE signal for 38% of drive tests on U.S. Cellular’s network, 21.3% of drive tests on T-Mobile’s network, and 16.2% of drive tests on Verizon’s network, despite each provider reporting coverage in the relevant area.”

You read that correctly. Over 35% of areas tested by each carrier did not deliver a minimum of 5 Mbps mobile service – the kind necessary to stream a video online. Worse than that, there was *no signal* for 16% to 38% of areas tested.

One would think such blatant misrepresentation would result in stiff penalties from regulators, but according to [ArsTechnica](#), the FCC “intends to issue an enforcement advisory to the broader industry, reminding carriers of the penalties associated with filings that violate federal law.” The major defense of the carriers is that they were simply following the FCC rules – the same rules they had warned the FCC were not adequate.

States and other groups that submitted challenge maps are upset with the FCC’s decision not to impose penalties for the inaccurate information submitted by carriers. In [one interview](#), Cari Bennet of the Rural Wireless Association said that local testing of these maps has cost challengers “millions of dollars that smaller carriers could have spent upgrading their broadband networks.” For example, it was revealed that South Dakota had spent nearly \$71,000 to audit coverage maps but will not be reimbursed for those expenses. In a hearing last Thursday, House Communications Subcommittee members from both sides of the aisle criticized the FCC for its rollout of the program and the findings of the report.

At Voqal we believe telecommunications policy should contribute to greater social equity for all Americans. Before the next \$9 billion goes out the door, the FCC should make every effort to modify its mapping process and hold carriers accountable for this blatant misrepresentation in order to ensure future maps better reflect areas where greater connectivity is needed.

Recent Posts

[Success of Rural Tribal Window
Demonstrates Need for Rural Education
Window](#)

[Applications are Open for the 2021 Voqal
Fellowship](#)

[Voqal DEI Spotlight: White Fragility, Two
Sides of a Coin](#)

[How Increasing Broadband Competition
Can Address the Adoption Gap](#)

[Saying Thanks and Farewell to Voqal
Board Member Pancha Valdez](#)

Subscribe

Receive blog notifications or the monthly Equity Newsletter