March 16, 2015

Marlene H. Dortch,
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268; *Policies Regarding Mobile Spectrum Holdings*, GN Docket No. 12-269

Dear Ms. Dortch:

Mobile Future respectfully submits the attached report, "The Truth About Spectrum Deployment in Rural America," by Diane Smith, CEO and founder of American Rural and Mobile Future advisor. The paper examines the state of rural wireless network deployment and competition with an eye toward how federal spectrum policies, including rules governing the incentive auction, can—and cannot— advance our innovation economy.

The report debunks the assumption that access to low-band spectrum is a primary contributing factor for the lack of buildout in rural areas. It also explains that setting auction rules that limit participation by carriers that have built infrastructure in and serve rural areas will not lead others to invest in rural America. A close examination of the facts and ongoing economics surrounding rural broadband deployment shows that while some carriers have consistently invested in mobile infrastructure in rural areas, Sprint and T-Mobile, who already have significant spectrum holdings (average of 84 MHz for Sprint and 32 MHz for T-Mobile) in the five rural states examined, have simply chosen not to make similar investments or to deploy any voice or data service in more than 75% of the counties in those states.

In fact, maps showing the four nationwide wireless carriers' spectrum holdings in the five most rural states in the contiguous U.S. (Montana, Wyoming, North Dakota, South Dakota and New Mexico) reveal:

- All four nationwide carriers hold spectrum in every county in these states.
- In counties where Sprint and T-Mobile provide no coverage on their networks, the companies hold on average of more than 84 MHz and more than 32 MHz of spectrum, respectively.

- Similarly, of the 231 counties in these five states, Sprint and T-Mobile each provide no voice or data service of their own at all in 177 of the counties.

The real barrier to rural deployment is the lack of potential revenue per square mile, compounded by some carriers' lack of willingness to build. But, allowing some carriers to obtain spectrum at a discount with no rural service obligations has no material impact on these fundamental economics.

The report outlines several more constructive and precise policy approaches including:

- Resisting calls to penalize wireless companies that already serve rural America through rules that limit their auction participation;
- Streamlining infrastructure siting requirements;
- Targeting universal service funds to unserved areas; and
- Thoughtful application of data roaming rules to encourage rural deployment.

The paper concludes that spectrum set asides are not the solution to expanding rural broadband deployment. Instead, we urge the Commission to ensure all providers have the same opportunity to build out their networks, acquire spectrum and compete for customers.

Pursuant to section 1.1206 of the Commission's rules, this letter is being filed electronically with the Commission.

Sincerely,

___/s/ Diane Smith___

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The Truth About Spectrum Deployment in Rural America

by Diane Smith

March 2015

Executive Summary

A key aim of federal policy is to increase economic opportunities and overall standards of living in rural America. Toward these ends, it is essential that rural America has access to the technology and infrastructure it needs to remain a vibrant and active participant in our nation's global mobile leadership. This report examines the state of rural wireless network deployment and competition with an eye toward how federal spectrum policies can—and cannot— advance this essential fabric of our innovation economy.

Despite challenging economics, 94 percent of rural customers are covered by two or more providers of 3G and/or 4G technologies.[1] Nearly 40 percent of rural customers are covered by at least four wireless providers.[2] Congress, the Administration and the Federal Communications Commission (FCC) all support ongoing infrastructure expansion—from making it a cornerstone of the FCC's National Broadband Plan to funding deployment in unserved areas.

Some argue that a perceived disparity in access to low-band spectrum below 1 GHz between AT&T and Verizon Wireless on one hand and Sprint and T-Mobile on the other is the primary reason additional providers are not deploying their own networks in rural areas. This has led to calls for spectrum set-asides in next year's planned broadcast incentive auction. But will such a 'solution' address the problem? A close examination of the facts and ongoing economics around rural broadband deployment clearly indicate the answer is no.

Among the key points:

- Mapping the four nationwide wireless carriers' spectrum holdings in the five most rural states in the contiguous U.S. (MT, WY, ND, SD and NM) is revealing:
    - All four carriers hold spectrum in every county in these states.
    - In counties where Sprint and T-Mobile provide no coverage[3] on their networks, the companies hold on average **more than 84 MHz** and **more than 32 MHz** of spectrum, respectively.

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[1] *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services*, Seventeenth Report, 29 FCC Rcd 15311 at ¶ 55 (WTB rel. Dec. 18, 2014) ("*17th Wireless Competition Report*").

[2] *Id.*

[3] *See* coverage maps below.

- Similarly, of the 231 counties in these five states, Sprint and T-Mobile each provide **no voice or data service of their own at all in 177 of them**.[4]
- By contrast, AT&T and Verizon have committed to investing in infrastructure to cover 300 million POPs with LTE over their own networks.[5]

- The real barrier to rural deployment is the lack of potential revenue per square mile.
  - The revenue potential for a wireless carrier in a major urban center is $248,000 per square mile of service.[6] By contrast, in the least densely populated areas, the potential revenue per square mile drops as low as $262 per square mile.[7]
  - Allowing some carriers to obtain spectrum at a discount with no rural service obligations has no material impact on these fundamental economics.
- More constructive and precise policy approaches include:
  - Resisting calls to penalize wireless companies that already serve rural America through rules that limit their auction participation;
  - Streamlining infrastructure siting requirements;
  - Targeting universal service funds to unserved areas; and
  - Thoughtful application of data roaming rules to encourage rural deployment.

The premise that Sprint and T-Mobile will use additional low-band spectrum to enter rural markets and compete with established providers is simply not supported by the facts. The broad commitment to world-class wireless infrastructure throughout our nation is admirable. This makes it all the more important we get the policy right to help us achieve this vital and shared objective.

[4] Appendix A contains additional charts detailing the coverage levels of each carrier throughout the 231 counties in Montana, Wyoming, North Dakota, South Dakota, and New Mexico.
[5] *See* AT&T, News, "About our Network," *available at* http://about.att.com/news/wireless-network.html (last visited Mar. 4, 2015); Verizon Wireless, News Center, "The Verizon Wireless 4G LTE Network," *available at* http://www.verizonwireless.com/news/LTE/Overview.html (last visited Mar. 4, 2015).
[6] *Id.*
[7] *Id.*

Introduction

Almost 20 percent of the entire population of the United States lives in rural counties and "[v]irtually every state contains rural areas, reflecting the country's diversity of communities."[8] Increasingly, rural Americans are entrepreneurs, technologists, innovators, and exporters who make an extraordinary contribution to the U.S. economy.[9] And, much of this diversification and growth is enabled by high-quality mobile communications and data services.

Tech visionary Steve Case recently predicted that, "Over the next decade, innovation and investment will accelerate in 'flyover country,'"[10] explaining that "*increased mobilit*y enables 'Rise of the Rest' start-ups to more easily attract talent…for lifestyle reasons, and by tapping into expertise all across the world by leveraging networks."[11] A lower cost of living, attractive quality of life and rising comfort levels working across geographic boundaries thanks to modern technologies give rural America its own set of unique attributes—indeed potential advantages—in contributing to our nation's global mobile leadership.

These rural innovators are modern-day pioneers, and the entire nation has a stake in the success of their boundary-pushing journey. This paper takes a critical look at who is providing mobile infrastructure to rural Americans today.[12] A clear-eyed examination of the economic and competitive landscape of rural wireless service is an essential first step to ensuring sound federal spectrum policies that encourage the build-out of robust mobile communications networks that seed the future of rural and small town America for decades to come.

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[8] Council of Economic Advisors, White House, *Strengthening the Rural Economy – The Current State of Rural America* (Apr. 27, 2010) ("Strengthening the Rural Economy"), *available at* http://www.whitehouse.gov/administration/eop/cea/factsheets-reports/strengthening-the-rural-economy/the-current-state-of-rural-america.

[9] *Id.*

[10] Steve Case, *Why innovation and start-ups are thriving in 'flyover country*,' Wash. Post, Sept. 22, 2014, *available at* http://www.washingtonpost.com/blogs/innovations/wp/2014/09/22/why-innovation-and-start-ups-are-thriving-in-flyover-country/.

[11] *Id.*

[12] Spectrum totals reported in this paper are based upon data downloaded from the FCC's Spectrum Dashboard on August 5, 2014. *See infra* note 35. Carrier coverage totals reported in this paper were calculated by Mosaik Solutions® using proprietary data, All Rights Reserved. Mosaik Solutions®, formerly known as American Roamer, is an independent consultant and industry leader in the collection and analysis of telecommunications coverage data. http://www.mosaik.com/. Carrier coverage totals were calculated as of August 2014.

Deployment of Wireless Infrastructure in Rural America Must Continue

The availability of advanced, high-quality mobile services is a lynchpin to increasing economic opportunities and overall standards of living in rural America. Moreover, given that 97 percent of our nation's landmass is rural, even Americans who live in urban and suburban areas rely on rural mobile telecommunications infrastructure as they travel beyond urban cores.

Rural deployment is deeply embedded in the fabric of federal communications law and policy. In the Omnibus Budget Reconciliation Act of 1993, which gave the FCC explicit authority to use competitive bidding to award wireless spectrum licenses, Congress directed the Commission to use a system of competitive bidding to promote, among other things, "the development and rapid deployment of new technologies, products, and services for the benefit of the public, including those residing in rural areas."[13] Similarly, the Communications Act contains certain universal service principles, making clear that consumers "in all regions of the Nation…should have access to telecommunications and information services…that are reasonably comparable to those services provided in urban areas."[14]

More recently, the FCC's National Broadband Plan enunciated the goals of ensuring that, "Every American should have affordable access to robust broadband service." Toward that end, the FCC is developing support mechanisms dedicated to the deployment of mobile broadband networks.[15] And, the American Recovery and Reinvestment Act provided the Department of Commerce's National Telecommunications and Information Administration and the U.S. Department of Agriculture's Rural Utilities Service with $7.2 billion to expand access to U.S. broadband services, particularly in rural areas.[16]

FCC statistics show that 98.5 percent of the population in rural areas are covered by at least one wireless provider offering 3G and 4G services (*i.e.* EVDO, EVDO Rev A, WCDMA/HSPA, HSPA+, LTE, and mobile WiMAX),[17] while 94 percent of rural customers are

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[13] 47 U.S.C. § 309(j)(3)(A).
[14] *Id.* § 254(b)(3).
[15] *Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663 (2011), *affirmed sub nom. In re FCC 11-161,* 753 F.3d 1015 (10th Cir. 2014); Order on Reconsideration, 26 FCC Rcd 17633 (2011); Second Order on Reconsideration, 27 FCC Rcd 4648 (2012); Third Order on Reconsideration, 27 FCC Rcd 5622 (2012).
[16] Pub. L. No. 111-5, 123 Stat. 115 (2009).
[17] *17th Wireless Competition Report*, 29 FCC Rcd 15311 at ¶ 55.

covered by two or more providers of such technologies. At the same time, nearly 40 percent of rural customers are covered by at least four wireless providers.[18] By contrast, in non-rural America, almost 100 percent of consumers are covered by two or more 3G/4G providers and more than 98 percent of consumers can choose from among three or more providers.[19] Additionally, as of January 2014, more than 400,000 people in rural areas still had no mobile wireless voice coverage and more than 800,000 lacked access to mobile broadband.[20]

What Policy Steps Should Be Taken To Promote Wireless Deployment in Rural Areas?

How do we increase the mobile infrastructure deployed in underserved areas of rural America? FCC Chairman Tom Wheeler recently supplied part of the answer – competition will lead to greater communications infrastructure deployment in rural America, including wireless.[21] Today, the nation's top two wireless providers cover approximately 95 percent of rural customers. Some policy advocates argue that a perceived disparity in access to low-band spectrum below 1 GHz between AT&T and Verizon on one hand and Sprint and T-Mobile on the other is the primary disincentive for additional providers to deploy spectrum in rural areas. Their argument is that low-band spectrum can travel greater distances than spectrum above 1 GHz, which results in larger cell-sites and thus lower deployment costs in rural areas.[22] Essentially, low-band spectrum allows for more cost-effective coverage over large geographic areas and inside buildings.[23] Because AT&T and Verizon have significant low-band spectrum holdings, the assumption seems to be that providing additional low-band spectrum to Sprint and T-Mobile

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[18] *Id.*
[19] *Id.*at Appendix III, Table III.A.ix.
[20] *Id.* at Appendix III, Tables III.A.vi, III.A.viii.
[21] Thomas E. Wheeler, Chairman, Federal Communications Commission, Prepared Remarks at 1776 Headquarters, Washington, D.C.: *The Facts and Future of Broadband Competition*, at 3 (Sept. 4, 2014) ("The simple lesson of history is that competition drives deployment and network innovation. That was true yesterday and it will be true tomorrow. Our challenge is to keep that competition alive and growing."), *available at* https://apps.fcc.gov/edocs_public/attachmatch/DOC-329161A1.pdf.
[22] Indeed, this idea is reflected in a blog post by Chairman Wheeler from last Spring. *See* Thomas E. Wheeler, Chairman, Federal Communications Commission, *Ensuring a Fair and Competitive Incentive Auction*, FCC Blog (Apr. 25, 2014, 12:32 PM), http://www.fcc.gov/blog/ensuring-fair-and-competitive-incentive-auction.
[23] *See Policies Regarding Mobile Spectrum Holdings*, 29 FCC Rcd 6133, 6149-50 (2014) ("*Mobile Spectrum Holdings*").

will motivate them to expand their infrastructure investment, and thus coverage, in sparsely populated rural areas.[24]

With this in mind, the FCC has focused on the forward auction component of the upcoming 600 MHz Broadcast Incentive Auction as "the last opportunity in the foreseeable future for providers to acquire licenses for below-1-GHz spectrum at auction."[25] In the Commission's view, "[g]iven the importance of multiple providers, including rural and regional providers, having access to below-1-GHz spectrum for deployment and competition…it is appropriate to adopt a market-based spectrum reserve for entities that do not currently hold a significant amount of below-1-GHz spectrum."[26] Several of the Commissioners expressly justify this spectrum set-aside as necessary to promote wireless spectrum deployment in rural areas.[27] While these arguments and the Commission's proposed approach may have the best of intentions, the facts on the ground tell a vastly different story. A previous Mobile Future white paper documents in detail that the Commission's practice of allowing all wireless companies the opportunity to participate fully in spectrum auctions does not prevent smaller operators from acquiring the spectrum they need to compete.[28] Indeed, in all nine auctions offering spectrum for terrestrial mobile broadband services conducted from 2003 to 2013, non-nationwide operators

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[24] *See Mobile Spectrum Holdings*, 29 FCC Rcd at 6196 ("Two nationwide providers, AT&T and Verizon Wireless, hold approximately 73 percent of all suitable and available below-1-GHz spectrum."); T-Mobile USA, Inc., *Mobile Spectrum Holdings*, WT Docket No. 12-269, Petition for Reconsideration, at 4-5 (filed Aug. 11, 2014); Sprint Corp., *Mobile Spectrum Holdings*, WT Docket No. 12-269, et al., Petition for Reconsideration, at 7-8 (filed Aug. 11, 2014).

[25] *Mobile Spectrum Holdings*, 29 FCC Rcd at 6196.

[26] *Id.*

[27] Statement of Chairman Thomas E. Wheeler, 29 FCC Rcd at 6264 ("Here is the bottom line: for the first time ever we have established a viable spectrum reserve for competitors in every market nationwide. Most importantly [sic], this reserve will make sure that consumers are more likely to benefit directly from increased competition in all parts of the country – rural, suburban and urban areas included."); Statement of Commissioner Mignon L. Clyburn, *id.* at 6265 ("I also strongly support the rule that would reserve up to 30 megahertz of spectrum, for the 600 MHz auction. . . . Below-1 GHz spectrum is particularly valuable for *deploying* wireless services in a more cost effective manner. Currently, there is substantial consolidation of below-1 GHz spectrum in the hands of just a few, nationwide carriers. The upcoming 600 MHz auction could allow these same carriers to increase this advantage over their competitors. And there is unlikely to be another auction, in the near future, that would permit their competitors to acquire below-1 GHz spectrum. That is why I am also glad that, in setting the unreserved/ reserved amounts in the forward auction, we are doing so with a local market approach.").

[28] *See* Mobile Future, *FCC Spectrum Auctions and Secondary Market Policies: An Assessment of the Distribution of Spectrum Resources Under the Spectrum Screen*, at iv (Nov. 2013), http://mobilefuture.org/wp-content/uploads/2013/11/Paper-Distribution-of-Spectrum-Resources.pdf.

and small businesses have won nearly half (46%) of the aggregate MHz/POPs.[29] And, in the most recent AWS-3 spectrum auctions, entities controlled by one company alone—DISH Network—successfully secured 44% of all spectrum licenses offered for auction.

Guaranteeing Sprint and T-Mobile Additional Low-Band Spectrum Is Not the Solution

The fact that wireless operators of all sizes can and do successfully obtain the spectrum they need calls into question the assumption that Sprint, T-Mobile and smaller operators require special access to below-1-GHz spectrum in order to build-out in rural areas. In point of fact, neither the unique propagation characteristics of low-band spectrum nor the need to promote wireless spectrum deployment in rural areas warrant the FCC providing special access to this spectrum for some providers, but not others. Access to low-band spectrum is simply not the primary barrier to wireless deployment in rural areas.

Under the Commission's overall spectrum auction regime, wireless providers make strategic business decisions about what kind of spectrum they will acquire and in what geographic regions they will invest and build-out their infrastructure. As demonstrated below, AT&T and Verizon have both acquired low-band spectrum and committed to investing in infrastructure to cover 300 million POPs with LTE over their own networks.[30] Moreover, Verizon has committed to extending its 4G LTE coverage beyond the footprint of its nationwide network. With its LTE in Rural America Program, the company is leasing 700 MHz spectrum to rural carriers that serve areas not currently covered by the Verizon network. By combining the rural carriers' tower and backhaul assets with Verizon's core LTE equipment and spectrum, these rural carriers can more rapidly build out and operate their own 4G networks.[31] Sprint and T-Mobile, by contrast, have passed on opportunities to acquire low-band spectrum in favor of amassing spectrum holdings in other bands. A Sprint representative recently stated, "[W]e believe that our spectrum position allows us to take a more aggressive stance in offering more

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[29] *Id.*
[30] *See* AT&T, News, "About our Network," *available at* http://about.att.com/news/wireless-network.html (last visited Mar. 4, 2015); Verizon Wireless, News Center, "The Verizon Wireless 4G LTE Network," *available at* http://www.verizonwireless.com/news/LTE/Overview.html (last visited Mar. 4, 2015).
[31] About Verizon Wireless, *available at* http://www.verizonwireless.com/aboutus/technology/network.html (last visited Mar. 4, 2015).

data."[32] And T-Mobile boasted, "[O]ur cost of capacity is predicated on the spectrum that we have per customer, which is the superior position to that of AT&T and Verizon."[33] Sprint and T-Mobile, unlike AT&T and Verizon, have made the strategic business choice not to invest in rural America even though they hold vast spectrum resources in those areas.

The following four maps, depicting each of the four nationwide wireless carriers' spectrum holdings in the five most rural states in the contiguous U.S., show that Sprint and T-Mobile hold plenty of spectrum in rural America.[34] In fact, each carrier holds spectrum in every county in these states - Montana, Wyoming, North Dakota, South Dakota and New Mexico.[35]

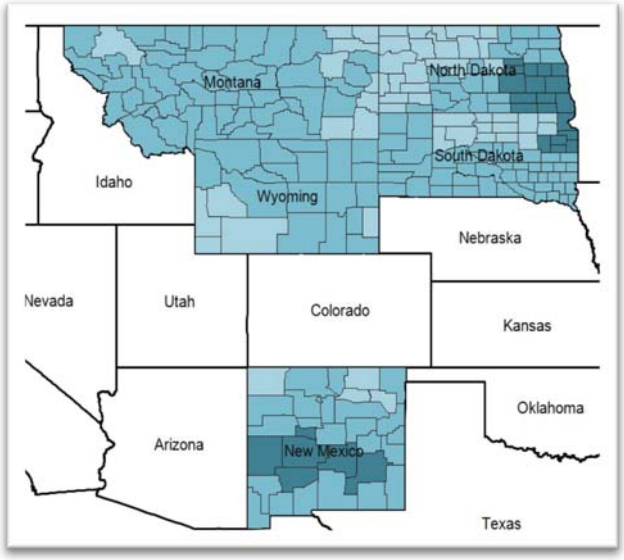
[32] Phil Goldstein, *Sprint exec: Our spectrum position supports shared plans with large data buckets*, FierceWireless (Aug. 20, 2014), *available at* http://www.fiercewireless.com/story/sprint-exec-our-spectrum-position-supports-shared-plans-large-data-buckets/2014-08-20.

[33] T-Mobile US (TMUS) Q4 2014 Results – Earnings Call Transcript, Seeking Alpha (Feb. 19, 2015), http://seekingalpha.com/article/2932366-t-mobile-us-tmus-q4-2014-results-earnings-call-transcript?page=4&p=qanda&l=last.

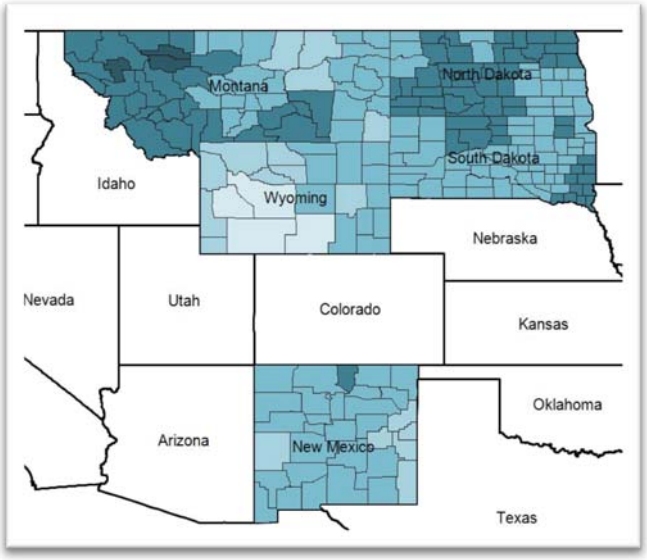
[34] Spectrum totals reported in this paper are based upon data downloaded from the FCC's Spectrum Dashboard on August 5, 2014. http://reboot.fcc.gov/reform/systems/spectrum-dashboard. License and lease holdings were tabulated for each carrier by county (in each of the five most rural states), and include spectrum in the following FCC radio services: AWS-1, Broadband Radio Service, Cellular, Educational Broadband, Lower 700 MHz, PCS Broadband (including G-Block), Upper 700 MHz and Wireless Communications Service. Sprint was credited with holding 14 MHz of Specialized Mobile Radio (SMR) spectrum in each county consistent with Sprint's representations in the Sprint-Nextel transaction. *See Applications of Nextel Commc'ns, Inc. and Sprint Corp. for Consent to Transfer Control of Licenses and Authorizations*, Public Interest Statement, Attachment J (Feb. 8, 2005) (Sprint and Nextel represented that the combined company, post-rebanding, would hold 14 MHz of 800 MHz SMR spectrum nationwide), *available at* https://wireless2.fcc.gov/UlsEntry/attachments/attachmentView.jsp?applType=search&attachmentKey=17993625&affn=01799362583643920584969 89. This approach is also consistent with the Commission's recent decision to include 14 MHz of SMR spectrum in the screen it uses to assess the competitive impact of proposed transactions. *See Mobile Spectrum Holdings*, 29 FCC Rcd at 6190 (finding that 14 MHz of 800 MHz SMR spectrum is available for the provision of mobile telephony/mobile broadband services).

[35] Carrier coverage totals reported in this paper were calculated by Mosaik Solutions® using proprietary data, All Rights Reserved. Mosaik Solutions®, formerly known as American Roamer, is an independent consultant and industry leader in the collection and analysis of telecommunications coverage data. http://www.mosaik.com/.

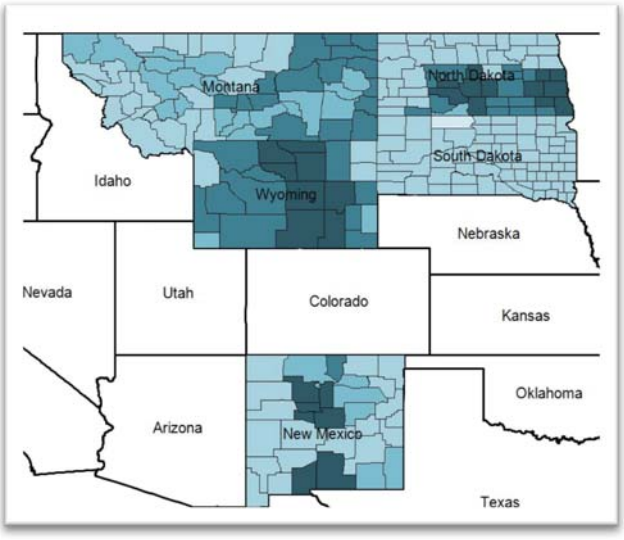
Nationwide Carrier Spectrum Holdings
in Five Most Rural States in Contiguous U.S.



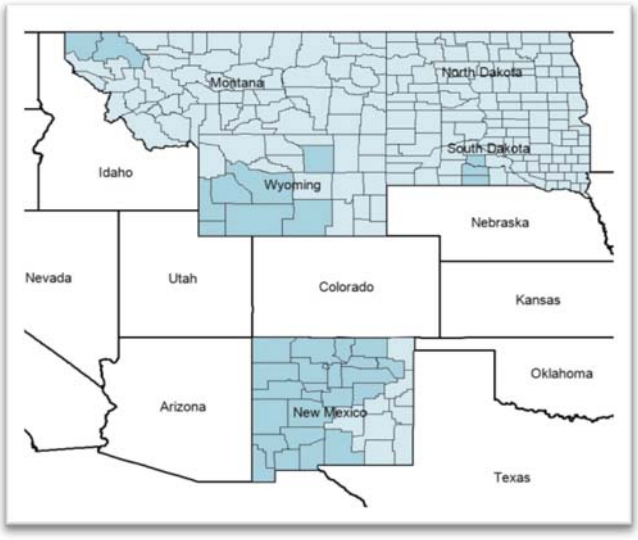
Verizon



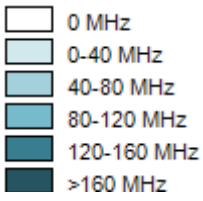
AT&T



Sprint



T-Mobile

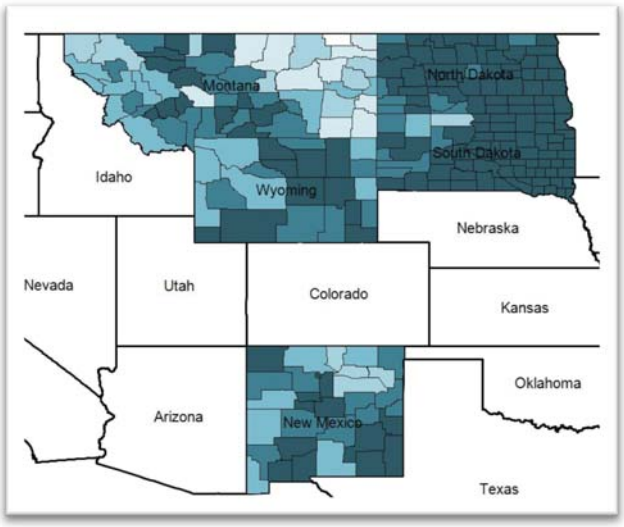


Data Source: FCC Spectrum Dashboard

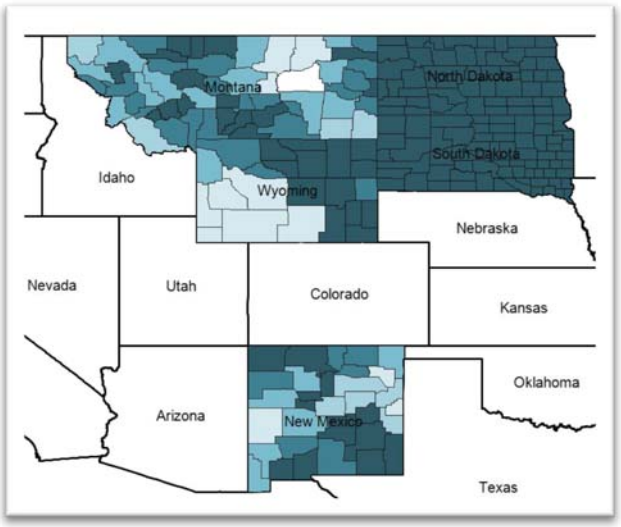
Notably, in the counties where Sprint provides no coverage[36] with its network, the company holds an average of **more than 84 MHz** of spectrum. T-Mobile also holds an average of **more than 32 MHz** of spectrum in each of the counties where it provides no coverage.

The next four maps show the voice coverage each of the four largest wireless carriers provides with their own networks in the five most rural states in the contiguous U.S.

Nationwide Carrier Voice Coverage on Own Networks in Five Most Rural States in Contiguous U.S.

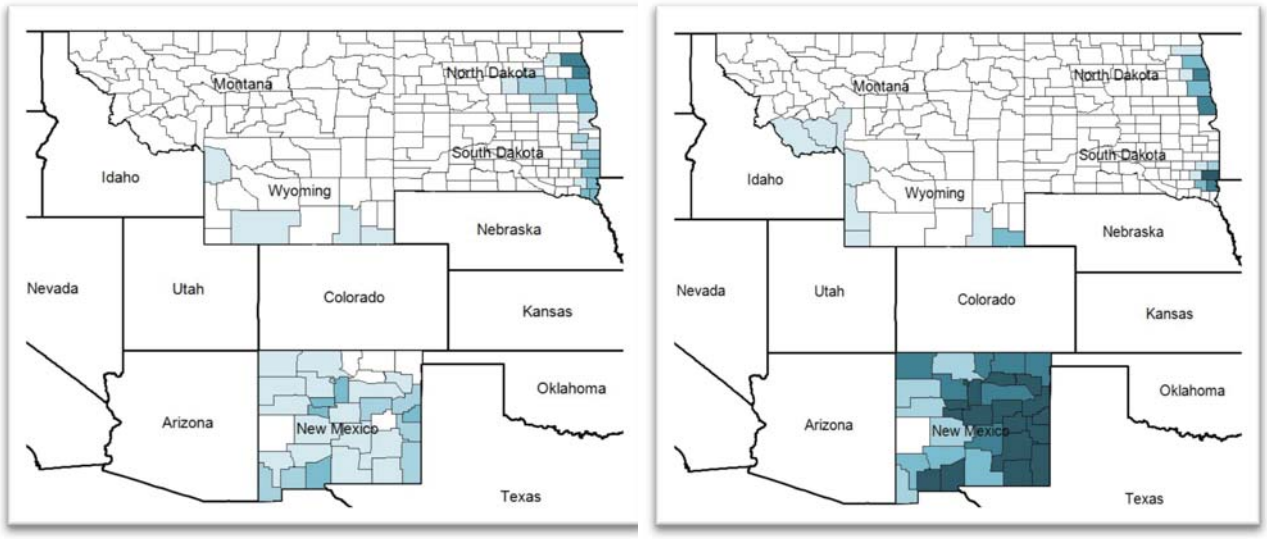


Verizon

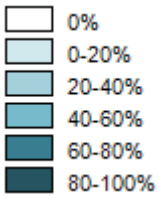


AT&T

[36] *See* coverage maps below.



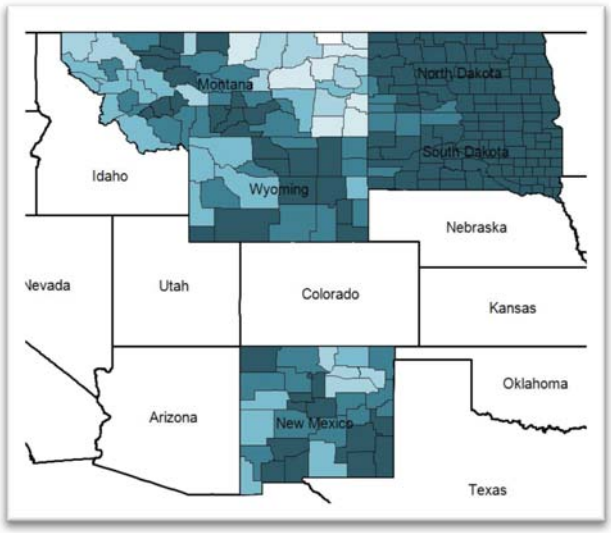
Sprint T-Mobile



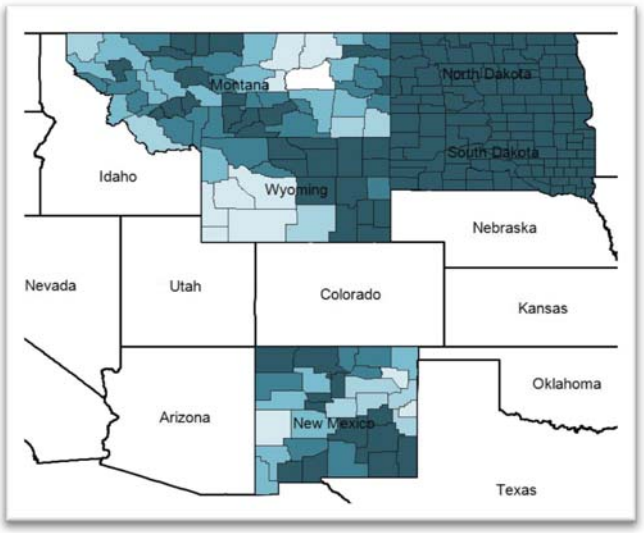
Data Source: Mosaik Solutions, LLC©

Similarly, the following maps demonstrate the data coverage the four largest wireless carriers provide with their own networks in the five most rural states.

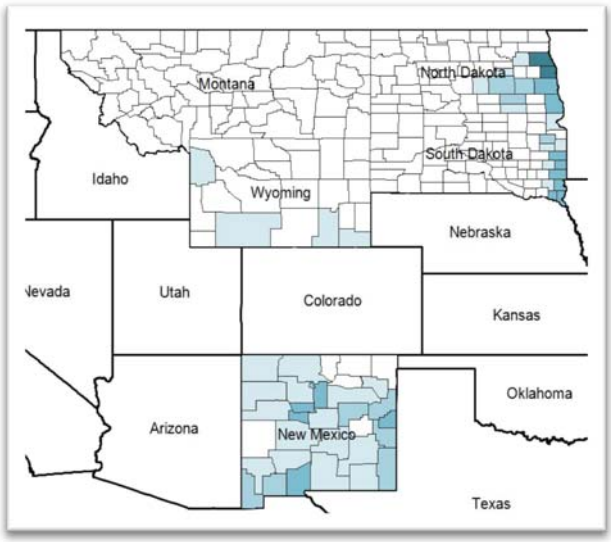
Nationwide Carrier Data Coverage on Own Networks
in Five Most Rural States in Contiguous U.S.



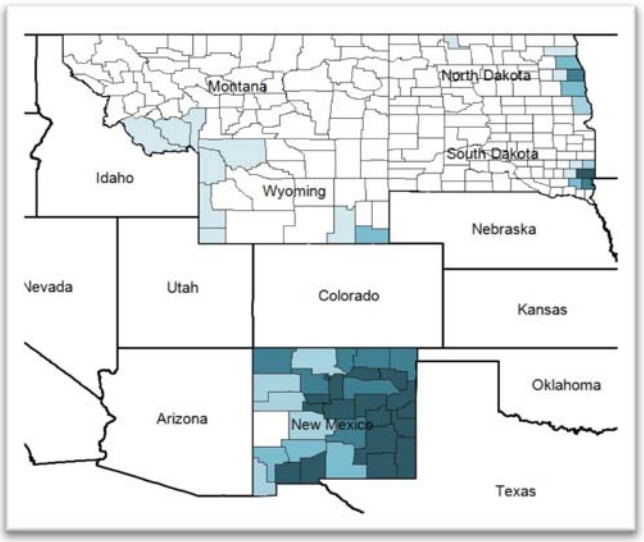
Verizon



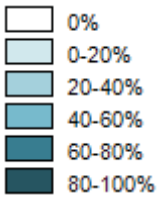
AT&T



Sprint



T-Mobile



Data Source: Mosaik Solutions, LLC©

The data make clear that Sprint and T-Mobile are not serving rural American consumers with their networks. Of the 231 counties in these five most rural states, Sprint and T-Mobile each provide **no voice or data service at all in more than 175 of them**.[37] They clearly do not lack for spectrum resources. Nevertheless, Sprint, T-Mobile and others continue to argue that they need special treatment in the upcoming spectrum auctions to obtain more spectrum in order to provide coverage to rural America.[38] As discussed below, giving them preferred access to below-1-GHz spectrum is not likely to result in substantial investment in rural wireless networks.

Conclusion: If Access To Low-Band Spectrum Is Not The Problem or Solution, What Is?

The evidence is clear: Sprint and T-Mobile do not use their networks to serve rural America because they have chosen not to deploy their spectrum, not because they lack spectrum. Why haven't Sprint and T-Mobile used their existing spectrum holdings to increase the service offerings available in rural America? And, if they haven't used spectrum already in their possession, why should policymakers believe that hobbling the participation of AT&T and Verizon, carriers that do provide these services, would actually increase mobile infrastructure deployment in these rural markets? Most important, what policy tools should be used to facilitate rural broadband deployment?

As demonstrated by Dr. Anna-Maria Kovacs, a Visiting Senior Policy Scholar at Georgetown University's Center for Business and Public Policy, the real disincentive to wireless spectrum deployment in rural areas is the lack of potential revenue per square mile.[39] "While low-frequency spectrum may lower the costs of serving rural areas, a critical determinant of what

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[37] Appendix A contains additional charts detailing the coverage levels of each carrier throughout the 231 counties in Montana, Wyoming, North Dakota, South Dakota, and New Mexico.

[38] Sprint Corporation, *Comment Sought on Competitive Bidding Procedures for Broadcast Incentive Auction 1000, Including Auctions 1001 and 1002*, AU Docket No. 14-252, Comments, at 40-48 (Feb. 20, 2015); T-Mobile USA, Inc., *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Policies Regarding Mobile Spectrum Holdings*, GN Docket No.12-268, WT Docket No. 12-269, Ex Parte Notification (Jan. 23, 2015); *Mobile Spectrum Holdings*, 29 FCC Rcd at 6196-97.

[39] Anna-Maria Kovacs, Georgetown University McDonough School of Business, *Regulation in Financial Translation: Will the Incentive Auction Increase Mobile-Broadband Competition in Rural America?*, at 1 (May 1, 2014), *available at* http://www.gcbpp.org/files/EPV/Kovacs_Spectrum_Auctions_Rural_5.1.2014.pdf?utm_source=Anna-Maria+EPV&utm_campaign=EVP+5%2F1&utm_medium=email.

companies do with their spectrum holdings hinges on revenue."[40] Indeed, according to Dr. Kovacs, the fact that wireless coverage is as ubiquitous as it is in rural areas is remarkable "in view of the nearly thousand-fold disparity in revenue per square mile between the most urban and most rural areas."[41] Dr. Kovacs recently found that the revenue potential for a wireless carrier in a major urban center is $248,000 per square mile of service.[42] By contrast, in the least densely populated areas of the U.S., the potential revenue per square mile drops as low as $262 per square mile.[43] Thus, as Dr. Kovacs put it, "no matter how cheap the spectrum, no matter how good its propagation characteristics, the lack of revenue potential in the [rural] market…remains a deterrent to investment."[44]

Interventionist policies that seek to drive additional low-band spectrum to providers like Sprint and T-Mobile, who have not deployed their existing spectrum in rural areas, will not alter the fundamental calculus on the revenue side. Thus, the premise that these carriers will use additional low-band spectrum to enter rural markets and compete with established providers is highly suspect. As Dr. Kovacs concludes, by driving additional low-band spectrum to Sprint and T-Mobile, the FCC will simply be subsidizing competition in already hotly competitive, high-density urban areas.[45] Federal policy should instead focus on ensuring *all* providers have a fair opportunity to participate in the upcoming incentive auction and secure additional low-band spectrum, including AT&T and Verizon who have already proven their willingness and ability to serve rural markets.

In light of the fundamental economic challenge of serving some rural markets, the federal Universal Service Mobility Fund also represents a strong, sensible policy approach to promoting wireless deployment in rural areas. This fund provides financial support for the expansion of mobile broadband networks in areas that might otherwise not be served. Mobility Fund Phase I provides immediate one-time support to accelerate the deployment of mobile broadband and voice service to unserved areas. A nationwide reverse auction held in September 2012 awarded

[40] *Id.* at 6.
[41] *Id.* at 2.
[42] *Id.*
[43] *Id.*
[44] *Id.* at 3.
[45] *Id.* at 6.

$300 million of Phase I funds to more than 30 service providers.[46] T-Mobile secured substantial support through this auction.[47] Tribal Mobility Fund Phase I provided approximately $50 million of support to five winning bidders to provide robust mobile broadband on tribal lands through a reverse auction conducted in February 2014.[48] Mobility Fund Phase II, when implemented, will provide ongoing support of up to $500 million each year to deploy and maintain mobile broadband and voice service in high-cost areas.[49] This support is available only to carriers willing to serve rural areas, and thus is a more effective means of expanding service in rural areas than simply allowing some carriers to obtain spectrum at a discount with no rural service obligations.

Thoughtful application of the Commission's data roaming rules affords the FCC another means by which to encourage continued enhancements to rural mobile infrastructure. The Commission should employ those rules to allow parties to enter into agreements on reasonable terms and conditions and at rates that encourage build-out and facilities-based competition in rural areas.[50] In some instances, small wireless carriers that serve very rural areas depend on roaming revenues to fund their operations. As the Cellular One Carriers recently noted, "Pressuring wholesale rates downward would unfairly disadvantage the carriers that do utilize their spectrum holdings, that do invest their time and capital, and that do bring much needed service to higher cost underserved areas. Conversely, facilitating the ability of a carrier with spectrum holdings in a market to instead obtain an artificially low roaming rate will create a disincentive for that carrier to invest any further to serve or better serve that market."[51]

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[46] *See* Universal Service Administrative Company, High Cost, Connect America Fund, Mobility Fund, ("USAC Mobility Fund") *available at* http://usac.org/hc/caf/mobility/default.aspx.

[47] *See* Federal Communications Commission, Public Notice, "Mobility Fund Phase I Auction Closes: Winning Bidders Announced for Auction 901," DA 12-1566, Attachment A (Oct. 3, 2012) https://apps.fcc.gov/edocs_public/attachmatch/DA-12-1566A2.pdf.

[48] *See Tribal Mobility Fund Phase I Auction Closes; Winning Bidders Announced for Auction 903*, Public Notice, 29 FCC Rcd 1974 (2014).

[49] USAC Mobility Fund, *available at* http://usac.org/hc/caf/mobility/default.aspx.

[50] *Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, WT Docket No. 05-265, Second Report and Order, 26 FCC Rcd 5411, at ¶¶ 34 (2011) ("Another potential cost is the possibility that requesting providers will substitute roaming for investment in coverage and accordingly under-invest in deploying new infrastructure. Again, however, our rule obligates the host provider only to offer data roaming on commercially reasonable terms and conditions.").

[51] *Petition for Expedited Declaratory Ruling filed by T-Mobile USA, Inc., Regarding Data Roaming Obligations*, WT Docket No. 05-265, Reply Comments of Cellular One Carriers, at 4 (filed Aug. 20, 2014).

The FCC also recently completed a rulemaking to facilitate nationwide wireless infrastructure deployment to support surging demand, expand broadband access, support innovation and wireless opportunity, and enhance public safety.[52] Specifically, the Commission updated and tailored the manner in which it evaluates the impact of proposed deployments on the environment and historic properties and adopted rules to clarify and implement statutory requirements related to State and local government review of infrastructure siting applications.[53] States and localities should likewise look to best practices to help ensure that their review of wireless infrastructure siting does not hamper deployment of the wireless infrastructure needed to serve rural areas. Taken together, these steps will further facilitate the delivery of more wireless capacity in more locations to consumers throughout the United States.[54]

But the policy challenge is not complete; rural leaders must continue to look at all tools at the local, state, and federal level to bring wireless broadband to their communities. Universal service funds at the state and federal level, thoughtful infrastructure policies, creative public-private partnerships, and other tools can all be utilized to enhance wireless deployment. The goal remains critical, but the spectrum set-aside proposal is unlikely to achieve it.

About American Rural and Mobile Future

Diane Smith is the CEO and Founder of American Rural. With over 88 million Americans living in rural or small towns, American Rural is devoted to increasing opportunities for thought leaders and policymakers at all levels to craft effective solutions for rural and small town America that reflect our innovative and entrepreneurial spirit for the good of the Nation. www.americanrural.org

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[52] *Acceleration of Broadband Deployment by Improving Wireless Facilities Siting Policies*, WT Dkt. Nos. 13-238 & 13-32, WC Dkt. No. 11-59, Report and Order, FCC 14-153, 2014 FCC LEXIS 3924 (rel. Oct. 21, 2014), *available at* https://apps.fcc.gov/edocs_public/attachmatch/FCC-14-153A1.pdf.
[53] *Id.*
[54] *Id.*

Mobile Future is an association of cutting-edge technology and communications companies, consumers and a diverse group of non-profit organizations, working to support an environment that encourages investment and innovation in the dynamic wireless sector. Our mission is to help inform and educate the public and key decision makers in business and government on the broad range of wireless innovations that are transforming our society and the nation's economy. http://www.mobilefuture.org

Appendix A: Coverage by Home Networks[55]

Voice Service

	Number of Counties Covered					
	0% Covered	0 – 20% Covered	20 – 40% Covered	40 – 60% Covered	60 – 80% Covered	>80% Covered
Verizon	1	10	13	23	45	139
AT&T	1	12	9	19	29	161
Sprint	177	28	11	13	2	0
T-Mobile	179	11	6	7	10	18

	Percentage of Counties Covered					
	0% Covered	0 – 20% Covered	20 – 40% Covered	40 – 60% Covered	60 – 80% Covered	>80% Covered
Verizon	0.43	4.33	5.63	9.96	19.48	60.17
AT&T	0.43	5.19	3.90	8.23	12.55	69.70
Sprint	76.62	12.12	4.76	5.63	0.87	0.00
T-Mobile	77.49	4.76	2.6	3.03	4.33	7.79

Data Service

	Number of Counties Covered					
	0% Covered	0 – 20% Covered	20 – 40% Covered	40 – 60% Covered	60 – 80% Covered	>80% Covered
Verizon	1	8	14	20	41	147
AT&T	1	11	10	19	29	161
Sprint	177	28	11	13	2	0
T-Mobile	177	13	7	7	9	18

	Percentage of Counties Covered					
	0% Covered	0 – 20% Covered	20 – 40% Covered	40 – 60% Covered	60 – 80% Covered	>80% Covered
Verizon	0.43	3.46	6.06	8.66	17.75	63.64
AT&T	0.43	4.76	4.33	8.23	12.55	69.70
Sprint	76.62	12.12	4.76	5.63	0.87	0.00
T-Mobile	76.62	5.63	3.03	3.03	3.90	7.79

[55] Carrier coverage totals reported in this paper were calculated by Mosaik Solutions® using proprietary data, All Rights Reserved. Mosaik Solutions®, formerly known as American Roamer, is an independent consultant and industry leader in the collection and analysis of telecommunications coverage data. http://www.mosaik.com/.