

Testimony of LeRoy T. Carlson, Jr.
Chairman – United States Cellular Corporation
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Subcommittee on Communications, Technology and the Internet
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Chairman Pryor, Ranking Member Wicker and members of the subcommittee, I am Ted Carlson, Chairman of United States Cellular Corporation. Thank you for the opportunity to speak with you today. I am pleased to provide you with my observations on the state of rural communications and the challenges we face in serving the people of rural America.

Introduction.

At U.S. Cellular, we deliver a world class customer experience and industry-leading innovations across our entire territory, not just in densely populated urban markets. We are expanding our state of the art 4G LTE network and will cover 87 percent of our customers by the end of this year. As the Chairman of a company that serves West Virginia, Missouri, Washington, Nebraska, New Hampshire, Indiana, Wisconsin, Minnesota, Virginia, and many other states, I can affirm that our commitment to a superior network and excellent customer service not only rivals, but beats, what is provided to consumers in urban areas. We are proud of the fact that, despite challenges of serving rural markets, US Cellular has been recognized with awards for offering the “Highest Network Quality Performance Among Wireless Cell Phone Users”

as well as being identified by various sources as the “Best Place to Buy a Cell Phone” and the “Number One Large Company to Work For.” We have proven that rural consumers don’t have to settle for second best and that being “rural” doesn’t equate to being left behind.

But providing those services in less densely populated areas does present a different set of business and regulatory challenges that urban providers don’t encounter. That is why we appreciate the Committee’s willingness to take the time today to examine those differences and, we hope, consider effective solutions to them.

For nearly thirty years, U.S. Cellular has been a leader in providing high-quality mobile wireless telecommunications and information services in rural America. Today, we operate in over 150 FCC-licensed markets throughout the nation, serving over 5 million customers, employing approximately 8000 associates, deploying the latest 4G mobile broadband technology and providing our customers with excellent service.

Providing an outstanding customer experience is an integral part of our success and should reassure you that “rural” can also mean “excellence” when it comes to communications services. We have won the J.D. Power Award for Highest Network Quality in the North Central Region of the United States for fifteen consecutive periods over eight years. We scored first in Forrester’s 2013 Customer Experience Index for wireless providers, surpassing the “big four” wireless carriers by a wide margin.¹ For the last three years, Consumer Reports has named U.S. Cellular the top service provider amongst post paid wireless carriers.²

¹ See Forrester Research, <http://www.forrester.com/home> (registration required); See also, “Nintendo, Fios, U.S. Cellular Top Forrester’s Consumer Rankings,” http://news.cnet.com/8301-1023_3-57565208-93/nintendo-fios-us-cellular-top-forresters-consumer-rankings/.

² www.consumerreports.org/cro/phoneplans0113.htm

Despite our consistently high performance, the wireless industry remains very challenging, especially for mid-sized and smaller carriers like us who tend to focus on rural areas. Let me provide some observations on what we're seeing in the marketplace, the challenges we face as rural wireless providers, and some solutions.

Lower 700 MHz Interoperability

First, as wireless providers deploy services in new spectrum bands, FCC rules must provide for interoperability across those bands in order to ensure that consumer needs such as roaming and device portability are met. A huge problem exists today in the 700 MHz Band. Decisions by national carriers to deploy handsets using customized designer band classes, have fractured the handset ecosystem, suppressed inter-carrier roaming opportunities for 4G service and locked customers into large carrier networks. Interoperability in the wireless industry is a pro-competitive concept that was first adopted by the Reagan-era FCC which recognized the potential for the then-dominant wireline companies to exclude non-affiliated cellular providers from the emerging wireless equipment ecosystem. The FCC must return to these principles, fix the problem in 700 MHz, and once again restore interoperability and, thus, competition and broader consumer choice, by adopting the proposals made by our Company, The Competitive Carriers Association ("CCA"), and the Interoperability Alliance. The FCC must also act to avoid a repeat of this problem as it considers the rules for 600 MHz incentive auctions. Failure to do so would undermine the competitive marketplace and

have a significant adverse impact on auction revenues in the incentive auctions.

Wireless interoperability was established by the Reagan era FCC at the start of the industry in order to foster a level playing field and to drive the development of roaming and a robust device ecosystem.

Fast forwarding to today, we face a world where a lack of device interoperability across the Lower 700 MHz band has largely prevented Lower 700 MHz A Block licensees from gaining access to consumer devices capable of operating on their spectrum. In turn, this lack of available devices has significantly hindered network deployments by these licensees. Notably, because “a significant number of Lower A Block licenses are held by smaller, rural, and regional licensees,”³ these deployment difficulties have had a disproportionate negative effect on consumers in rural and unserved areas.

This lack of interoperability arose because the 3rd Generation Partnership Project (“3GPP”) developed two separate, duplicative, and incompatible band classes for Long-Term Evolution (“LTE”) wireless broadband operations in the Lower 700 MHz band. Specifically, Band 12 covers operations in the Lower A, B, and C Blocks, whereas Band 17 only covers operations in the Lower B and C Blocks. AT&T, the only national carrier providing service in the Lower 700 MHz band, operates in the Lower 700 MHz using only Band 17 equipment, which cannot be used by Lower A Block licensees. Because AT&T is the only licensee operating in Lower 700 MHz band which is large enough to be capable of driving the device ecosystem, the Lower A Block licensees have found themselves with essentially no LTE mobile devices to sell to their

³*Promoting Interoperability in the 700 MHz Commercial Spectrum*, Notice of Proposed Rulemaking, 27 FCC Rcd 3521, 3532 (2012) (“*Interoperability NPRM*”).

existing and prospective subscribers. The lone exception is U.S. Cellular, which, through great effort, managed to secure a small portfolio of LTE devices capable of operating on band 12 and thus utilizing the Lower A Block spectrum. The 2012 launch of LTE service by U.S. Cellular in conjunction with its partner, King Street Wireless, remains the only Band 12 network launch since Lower 700 MHz licenses were auctioned in 2008. However, U.S. Cellular is the exception, and even it remains constrained in its ability to gain access to a wide variety of LTE-capable devices. Notably, because of the ongoing lack of interoperability between Band 12 and Band 17 in the Lower 700 MHz band, a number of Lower A Block licensees were compelled to request an extension of their interim construction benchmark deadlines, which the FCC recently granted.⁴

The industry has been actively seeking intervention by the FCC since 2009. Back in September of that year, after discovering that AT&T had begun to issue Requests for Proposals that specified Band 17-only equipment, an alliance of Lower 700 MHz A Block licensees (the “Good Faith Alliance”) filed a petition for rulemaking asking the FCC to adopt an interoperability requirement for the Lower 700 MHz band.⁵ In doing so, the Good Faith Alliance warned the FCC that various public interest harms would arise if it failed to prohibit AT&T from deploying Band 17-only devices. The FCC sought comment on this petition in 2010.⁶ Commenters in support of the petition included small and regional 700 MHz licensees, a coalition including Sprint Nextel and

⁴See *Wireless Telecommunications Bureau Extends 700 MHz A Block Licensee Interim Construction Benchmark Deadline Until December 13, 2013*, Public Notice, DA 13-210 (rel. Feb. 13, 2013).

⁵See *Petition for Rulemaking Regarding the Need for 700 MHz Mobile Equipment to be Capable of Operation on All Paired Commercial 700 MHz Frequency Blocks*, 700 MHz Block A Good Faith Purchasers Alliance, RM-11592 (filed Sept. 29, 2009).

⁶See *Wireless Telecommunications Bureau Seeks Comment on Petition for Rulemaking Regarding 700 MHz Band Mobile Equipment Design and Procurement Practices*, Public Notice, 25 FCC Rcd 1464 (2010).

T-Mobile, trade associations representing rural and smaller providers, a coalition of public interest groups, and public safety associations. Nevertheless, the FCC took no further action regarding the lack of interoperability in the Lower 700 MHz band until March 2012, when it released a Notice of Proposed Rulemaking seeking additional comment on the issue.⁷ Once again, the vast majority of commenters, representing various carriers and organizations, urged the FCC to adopt an interoperability requirement. Unfortunately, although it has been more than three and a half years since the Good Faith Alliance filed its petition, the FCC still has not adopted an order in that proceeding. And this is despite the fact that the FCC has acknowledged that “a unified band class across the Lower 700 MHz band has the potential to yield significant benefits for all licensees.”⁸

Interoperability across the Lower 700 MHz band would greatly benefit the public. For instance, as noted, the current and ongoing lack of interoperability has severely impeded the competitive roll-out of LTE broadband coverage by Lower A Block licensees because the lack of interoperability undermines the business case for smaller carriers to deploy networks. In turn, the lack of interoperability has impeded access to broadband services in the many parts of the U.S. not served by AT&T. In other words, consumers across the country are being deprived of the substantial benefits of broadband access due to the lack of interoperability in the Lower 700 MHz bands.

More broadly, the difficulties faced by Lower A Block licensees decrease competition in the wireless marketplace to the detriment of consumers. This is because significant opportunities for small and regional carriers – who otherwise would be in a

⁷See *Interoperability NPRM*, 27 FCC Rcd 3521 (2012).

⁸See *id.* at 3522.

position to provide robust competition to the dominant national carriers – have been lost due to the artificial barriers created by their inability to obtain devices capable of operating on their spectrum holdings. The importance of continuing to advance robust competition is especially crucial at this time given that the wireless industry is in its most precarious competitive state in over a decade. For instance, in its most recent Competition Report issued in March, the FCC, for the third straight year, was unable to find the existence of “effective competition” in the wireless industry.⁹ In fact, the weighted average of the FCC’s Herfindahl-Hirschman Index (“HHI”) calculations increased to 2873 since the FCC’s previous report.¹⁰ Notably, an HHI exceeding 2500 indicates that a market is “highly concentrated.”¹¹ The FCC also noted that, from 2003 to year-end 2011, the average HHI has increased from 2151 to 2873, which represents a 33.6% increase in market concentration over this time.¹² If Lower A Block licensees are provided a level playing field, they could help to correct this competitive imbalance. Unfortunately, at this time, the potential for Lower 700 MHz A Block deployments to spur increased competition has not come to fruition because additional competitive carrier LTE deployments have been delayed and/or limited by the continued fragmentation of the Lower 700 MHz spectrum band.

Moreover, absent interoperability, Lower A Block licensees likely will never be capable of providing effective competition because they will not be able to provide the quantity and quality of devices necessary to attract a substantial customer base. As the

⁹ See *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*, Sixteenth Report, WT Docket No. 11-186, FCC 13-34, ¶ 2 (rel. Mar. 21, 2013) (“*Sixteenth Competition Report*”).

¹⁰ See *id.* ¶ 59.

¹¹ See *id.* at ¶ 54.

¹² See *id.* at ¶ 59.

Commission recognized in the *Sixteenth Competition Report*, mobile handsets and devices “directly affect the quality of a consumer’s mobile wireless experience and can factor into a consumer’s choice of a wireless provider.”¹³ As such, a carrier’s “portfolio of handsets and devices may be a significant non-price factor affecting its ability to compete for customers.”¹⁴

To date, Lower A Block licensees have found themselves with essentially no LTE mobile devices to sell to their existing and prospective customers, which is not surprising considering that vendors seek first to serve the demands of their largest possible customers, where volume (and profitability) is greatest. Smaller carriers simply cannot drive handset development. Moreover, even if smaller carriers manage to gain access to some devices, those devices will cost more because these carriers lack the economies of scale necessary to reduce costs. These higher device costs for Lower A Block licensees must either be passed on to the consumer (in the form of higher retail prices, which most consumers will not pay if given the choice of service providers), or absorbed by the Lower A Block licensee if it chooses to instead price LTE devices comparably to similar devices offered by the national operators. The consequences of this latter approach, however, would be unsustainable. Because device subsidies result in slim – or in some cases nonexistent or negative – profit margins, Lower A Block licensees may become unprofitable and could eventually be forced out of business, which results in even less marketplace competition.

In addition to increasing their negotiating leverage and economies of scale, volume purchases afford the larger carriers with considerable market power *vis-à-vis*

¹³*Id.* at 83.

¹⁴*Id.*

handset manufacturers, which can be used to demand particular customer features, compel prioritization of proprietary specifications, and achieve exclusive or extended first-to-market positions. As a result, even if additional Band 12 devices become available, they likely will be delayed for months or years after the introduction and refinement of multiple Band 13¹⁵ and Band 17 devices. Lower A Block licensees therefore will not have available to them all of the “cutting edge” phones, further entrenching the largest carriers’ dominant market positions. In sum, Lower A Block licensees, like all carriers, require a sufficient *quantity* and *variety* of handsets to meet consumer demand.¹⁶ However, the lack of interoperability has produced a device ecosystem in which widely available, economically reasonable handsets cannot function on the Lower A Block spectrum. The resulting higher device costs and the associated lack of a device ecosystem for Band 12 devices slows deployment by Lower A Block licensees and puts these carriers at an even greater competitive disadvantage.¹⁷

Moreover, even if most Lower A Block licensees managed to obtain a sufficient quantity and quality of handsets and could find a way to cost-justify deploying their networks, they would find themselves at a serious competitive disadvantage because large carriers already will have established a substantial customer base that, absent interoperability, will not be able to take their phones and switch to competitors, no matter how much better or less expensive the competing service may be. Thus, in addition to conflicting with consumers’ expectations, the inability of a subscriber to

¹⁵ Band 13 supports the Upper 700 MHz C Block, the vast majority of which is licensed to Verizon Wireless.

¹⁶*See id.* at ¶ 220 (“In addition to competing on price and network quality, mobile wireless providers continue to compete by offering consumers a variety of different mobile wireless devices with innovative features.”).

¹⁷*See id.* at ¶ 184 (“When competing mobile wireless service providers deploy compatible network technologies, greater economies of scale in the production of both end-user devices and network infrastructure equipment can result, lowering the unit cost of handsets, chipsets, and other network equipment. This, in turn, may promote more rapid adoption of mobile wireless services, a greater variety of handsets, and more price competition.”).

seamlessly switch to another carrier further exacerbates the “head-start advantage” large carriers already enjoy because consumers will be less willing or likely to seek service from Lower A Block licensees for a considerable period of time. As a result, unless the FCC promptly adopts an interoperability requirement, the harms to both Lower A Block licensees and, more importantly, the consumers they serve, will be baked into the competitive landscape and will continue indefinitely.

The current, and potentially future, dearth of rural LTE networks will be problematic not only for potential customers and for commercial licensees in rural markets, but also for public safety users who may desire to roam on commercial systems in those areas. This is significant because FirstNet, the First Responder Network, is required to enter into roaming agreements with commercial providers to ensure nationwide coverage, and the nature of any interoperability requirement for commercial users will have a profound impact on the ability of FirstNet and the FCC to meet these roaming obligations. Moreover, because Lower A Block licensees include many rural carriers, the areas they serve are exactly the places where public safety may most need to roam onto commercial networks. A lack of interoperability therefore could impede first responders’ ability to respond to emergencies.

Likewise, absent an interoperability requirement, roaming options for Lower A Block licensees will remain severely limited because they still would be prevented from roaming on AT&T’s network. And, because AT&T is the only carrier that can be expected to operate a nationwide LTE network using Lower 700 MHz spectrum, the result will be that Lower A Block licensees will have no potential nationwide roaming partner. In other words, the existence of Band 17 has the effect of denying any carrier

using Band 12 access to nationwide roaming on the Lower 700 MHz spectrum.¹⁸ As the FCC recently acknowledged, “roaming remains particularly important for small and regional providers with limited network population coverage to remain competitive by meeting their customers’ needs for nationwide service.”¹⁹ Thus, the absence of nationwide roaming likely will cause many consumers to avoid regional A Block licensees in favor of the national networks of AT&T or Verizon.

Although the FCC would prefer an industry solution to the current lack of interoperability in the Lower 700 MHz band,²⁰ no industry solution has been forthcoming since this issue was identified over three and a half years ago. And there is no reason to believe that the industry will change its course absent a regulatory requirement. In a highly concentrated market, large carriers gain little, and could potentially lose much, by voluntarily agreeing to interoperability. Large carriers derive little or no benefit from affording their customers the ability to roam on rival networks because these carriers own geographically extensive networks, making the potential incremental coverage available to them (and to their customers) via roaming quite small. Moreover, interoperability would enhance the competitiveness of rival carriers by affording them the ability to offer their customers a variety of cutting edge devices and comparable geographic coverage.

Ensuring that the core principles and rules that support interoperability are maintained also would reduce customer switching costs, and thus enhance the potential for increased churn by making it easier for customers to migrate to rival providers. In

¹⁸*See id.* at ¶ 208 (“Many of these non-nationwide providers are able to offer voice coverage and service plans that are national in scope through roaming agreements with other mobile wireless providers.”).

¹⁹*Id.*

²⁰*See Interoperability NPRM*, 27 FCC Rcd at 3543.

sum, the current competitive state of the wireless industry, as well as ongoing resistance to interoperability in the Lower 700 MHz band by the largest carriers, demonstrates that the possibility of a voluntary industry solution is highly unlikely. As a consequence, Commission action is necessary.

In terms of a regulatory solution, U.S. Cellular has offered a measured and incremental proposal to the FCC in order to restore interoperability across the Lower 700 MHz band while minimizing the impact on existing network deployments by AT&T. Specifically, the FCC should require that, within six months of the FCC's adoption of an order in its interoperability proceeding, all Lower 700 MHz licensees provide only devices that are capable of operating on all paired Lower 700 MHz bands. The only hardware design change required by this approach is replacing, *on newly ordered devices*, the Band 17 duplexer and RX filter with Band 12 components as well as a simple software update that would be required to support both Band 12 and Band 17. These new devices deployed going forward would be able to operate on Band 12 or Band 17 networks. In other words, network upgrades would not be required. Such a regulatory requirement would be consistent with the Commission's "longstanding interest in promoting the interoperability of mobile user equipment in a variety of contexts as a means to promote the widest possible deployment of mobile services, ensure the most efficient use of spectrum, and protect and promote competition."²¹

In the early 1980's the FCC wisely perceived the potential risks to competition if the wireline incumbents were permitted to build an exclusive ecosystem that lacked interoperability with their "non-wireline" competitors. As competition blossomed in the

²¹*Id.* at 3523, n. 5.

wireless industry, the market ensured continued interoperability as, by necessity, the industry worked together to foster a vibrant ecosystem. As the wireless industry has again reached high levels of concentration, preserving the viability of strong, rural-focused competitors demands that we restore interoperability.

600 MHz

In addition to restoring broad interoperability of networks and user devices, the government must ensure that the primary “raw material” of the wireless industry, licensed spectrum, is made available to a broad range of wireless carriers, including smaller carriers focused on rural America. Without sufficient spectrum, consumers' insatiable demand for high speed broadband will go unmet. US Cellular wholeheartedly congratulates this Committee for its efforts and success in the 2012 Middle Class Tax Relief and Jobs Creation Act (“Spectrum Act”)²² to identify and free up additional commercial spectrum.

The FCC must auction spectrum using geographic area sizes that allow smaller, non-national carriers to compete. There are a number of benefits enabled by this. First, smaller geographic areas will increase the number of bidders, which has been proven to generate more revenue. Second, smaller license areas ensure that rural markets that are won at auction will see faster build out than if those areas are the merely the most sparsely populated zones within larger regions. A build out requirement, applied to each license, will result in the urban areas being built long before the more rural areas see any attention.

²² See Pub. L. No 112-96, 125 Stat 156 (2012)

For the same reason, package bidding must be rejected by the FCC. Smaller carriers whose aspirations are rural should not be handicapped in the bidding process simply because they don't have business plans that allow them to bid on a large aggregation of licenses.

A third core principle is that the government should endeavor to maximize the amount of spectrum auctioned not only in order to meet consumer demand and foster competition, but also to raise revenues and provide funding for FirstNet, which is a national priority.

While these efforts will help address the increasing demand for spectrum, we also know that even more spectrum will need to be repurposed to keep up with consumer demands. Therefore, further work needs to be done to identify additional spectrum, some of which is currently used by federal agencies including the Department of Defense.

So how should the government approach this situation? We believe the 600 MHz incentive auction provides a unique opportunity to address our nation's skyrocketing spectrum demands, and meeting those spectrum needs "is essential to continuing U.S. leadership in technological innovation, growing our economy, and maintaining our global competitiveness."²³ Led by the efforts of CTIA, CCA, and others, many in the wireless industry are devoting significant efforts towards making this auction a success. In response to the FCC's *Incentive Auction NPRM*, U.S. Cellular focused on several issues critical to ensuring that the substantial public interest benefits made possible by the Spectrum Act's grant of incentive auction authority are fully

²³*Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, 27 FCC Rcd 12357, 12358 (2012) ("*Incentive Auction NPRM*").

realized. For instance, U.S. Cellular urged the FCC to maximize the amount of paired spectrum made available in the forward auction for wireless broadband services, which will greatly promote the availability of wireless broadband services in rural locations. The excellent propagation characteristics of the 600 MHz band make this spectrum particularly well-suited for the rapid and efficient deployment of mobile and other advanced services in high-cost rural areas. This is true because sub-1 GHz frequencies travel farther at a given power level, which enables a larger area to be served from a single cell site. In other words, the superior propagation performance of this spectrum means that fewer towers will be needed to serve a given area, and thus networks can be deployed at lower cost. Accordingly, the 600 MHz band provides a particularly valuable opportunity for licensees to provide cost-effective services in rural and underserved areas.

But identifying, repurposing, and auctioning the spectrum is only part of the story. It is also critically important that the FCC adopt interoperability requirements for the 600 MHz band. Otherwise, it would risk a situation like that in the Lower 700 MHz band, which has stranded investment in spectrum licenses and drastically delayed the deployment of advanced services to many rural and underserved areas. As detailed in this testimony, an interoperability requirement would expand roaming opportunities, enhance economies of scale, promote network deployment, and increase competition in the wireless industry, which would spur investment and innovation and lower costs for consumers. Also as noted, absent an interoperability requirement, the financial incentives of the largest carriers, which drive device development, would drastically reduce the likelihood of an interoperable 600 MHz band. For that reason,

interoperability in the 600 MHz band, and the substantial benefits it would create, will only become a reality through an express requirement. Adopting an interoperability rule at this stage also is necessary so that potential bidders that are not large enough to drive device development will know in advance that the 600 MHz band will conform to the FCC's traditional model of full interoperability. In other words, if the FCC declines to adopt an interoperability requirement, this failure would deter auction participation by all but the largest carriers, and thus harm the competitiveness of the forward auction.

Several licensing and auction rules also are critical to ensure adequate opportunities for small and regional carriers to purchase 600 MHz licenses and thereafter deploy rural networks. Providing such opportunities to these carriers is critical in light of the current state of sub-1 GHz spectrum holdings. Specifically, when measured on a licensed MHz-POP basis, Verizon Wireless holds approximately 45 percent of the currently licensed sub-1 GHz spectrum, while AT&T holds approximately 39 percent.²⁴

In this respect, U.S. Cellular urged the FCC to license the 600 MHz band on the basis of geographic license areas no larger than Economic Areas ("EAs"). Only by offering smaller license areas can the FCC preserve opportunities for small and regional carriers, as well as new entrants, to provide an important source of competition, variety, and diversity in rural and less densely populated areas. Small license areas permit entities which are only interested in serving rural areas to acquire licenses for these areas alone and avoid acquiring licenses covering high population areas that would be prohibitively expensive for these carriers.

²⁴*See id.* at ¶ 129.

Of vital relevance to today's hearing, licensing the 600 MHz band using service areas no larger than EAs therefore would be the most effective means for the FCC to foster the prompt availability of competitive wireless broadband services to rural markets. At the same time, all carriers would benefit because small license areas would allow more targeted spectrum acquisitions, while not discriminating in favor of any single business plan.

In contrast, nationwide or super regional license areas, which U.S. Cellular strongly opposes, would significantly disadvantage small and regional carriers, as well as consumers in small and rural markets, to the benefit of the already dominant national carriers. The use of these large service areas skews auctions in favor of large financially stronger bidders, effectively foreclosing smaller bidders from participating in an auction. Not only do small carriers lack the need for large swaths of territory, they lack the financial resources to compete for nationwide or large regional licenses. Unlike the national carriers, smaller carriers cannot afford to acquire and "warehouse" spectrum for future use that does not meet their near-term business objectives. Thus, the practical effect of having a band plan that includes very large market areas is to place a significant portion of the auctioned spectrum in the hands of the few national carriers, which historically have not given priority to small and rural markets. As a consequence, rural deployment of the innovative and advanced types of services made possible by the 600 MHz spectrum would likely be significantly delayed, if not precluded entirely, if the FCC licenses this spectrum on a nationwide or large regional basis. At the same time, larger carriers would not be disadvantaged by the use of smaller license areas because they would still have realistic opportunities to aggregate licenses

individually.²⁵ In other words, auctioning small license areas benefits all carriers by allowing them to take a building block approach and assemble as much coverage area as is needed.

U.S. Cellular further urged the FCC to ensure that smaller carriers are adequately protected if the FCC decides to auction generic licenses in the forward auction. For instance, the generic licenses should be as similar and technically interchangeable as possible, and the FCC should establish only two classes of generic licenses – those for paired spectrum blocks and those for supplemental, downlink-only blocks. Not only would additional subdivisions further complicate the auction, they would make interoperability less likely because the largest carriers could dominate a particular subdivision to the exclusion of other bidders. In addition, the subsequent license assignment process must be entirely random. If the FCC instead incorporates any preferences into this process, it would greatly advantage the largest carriers, which will be both more likely to have multiple blocks in the same market and licenses in adjacent markets. The result could be to force all other 600 MHz licensees into distinct portions of the 600 MHz band that are devoid of the largest carriers and their ability to drive the device ecosystem. Even more important, under no circumstances should the FCC establish an allocation process that involves additional bids. Such a process would leave bidders who have already made financial commitments subject to an uncertain further commitment and would increase the likelihood of relegating smaller carriers to spectrum assignments which lack any of the largest carriers and a device ecosystem.

²⁵See *Incentive Auction NPRM*, 27 FCC Rcd at 12411 (“EAs nest within and may be aggregated up to larger license areas ... for operators seeking larger service areas.”).

Another action necessary to ensure adequate opportunities for small and regional carriers is for the FCC to adopt an auction-specific spectrum aggregation limit that prohibits any applicant from acquiring more than 25 percent of the 600 MHz spectrum made available in a single geographic market. Absent such a limit, the FCC would risk another Auction 73, which was dominated by the two largest carriers and which resulted in a lack of interoperability among Lower 700 MHz band handsets and the “stranding” of 700 MHz A Block licenses. Such a limit also would be consistent with the mandate of Section 309(j)(3)(B) of the Communications Act²⁶ to “avoid excessive concentration of licenses” and to disseminate licenses among “a wide variety of applicants.”²⁷ The FCC should impose this limit in advance of the forward auction, which would deter applicants from acquiring more spectrum than they can use and preventing smaller bidders from acquiring the spectrum. Allowing post-auction divestitures is not really a solution because this would enable the largest carriers to choose among the competitors to which to divest their spectrum, which could further harm competition. U.S. Cellular does not ask for a ban on the ability of the largest carriers to participate, but only a reasonable limit on how much spectrum one carrier may acquire.

Prohibiting the use of combinatorial, or “package,” bidding is another action necessary to ensure adequate competition during the auction by small and regional carriers. Permitting combinatorial bidding for any portion of the 600 MHz licenses would harm small, rural and regional carriers, as well as prospective new entrants, while benefiting only the largest carriers. Combinatorial bidding would add unnecessary complexity to what is already likely to be the most complicated spectrum auction in the

²⁶ 47 U.S.C. §309(j)(3)(B).

²⁷ See *Incentive Auction NRPM*, 27 FCC Rcd at 12484.

nation's history. The burden of such complexity and the increased risk it creates, would fall disproportionately on smaller bidders and could deter their participation. The lesson of past auctions is clear. The rules required to enable combinatorial bidding create unintended opportunities for larger bidders to enhance their bidding power, exploit the rules, and ultimately win licenses at lower prices. Even absent the use of "strategic bidding", combinatorial bidding would increase the likelihood that large bidders will tie-up multiple licenses in nationwide or super-regional package bids, and thereby exclude smaller carriers with targeted business plans from acquiring the spectrum necessary to serve rural areas. The benefits achieved by offering small geographic license areas can be undone by package bidding rules.

Further, unlike a license-by-license aggregation strategy, combinatorial bidding could create a situation where the FCC is forced to accept a package bid for a group of licenses even though small or rural carriers may have placed higher bids, on a per-pop basis, for one or more of the licenses included in the package. The result is that combinatorial bidding biases auction results in favor of the combination bid, disadvantaging all but the largest bidders and likely excluding small bidders from any meaningful auction success. These adverse consequences of combinatorial bidding raise legal issues as to whether the Commission has actually granted licenses to the parties that valued them most highly. Moreover, the bias against all but the largest bidders potentially has the effect of forcing all other bidders to bid more aggressively on the remaining licenses that are not included in any package. This distortion would increase the prices of these licenses, resulting in an extra burden on smaller bidders that may easily deprive them of licenses. At the same time, package bidding is

unnecessary because adequate spectrum aggregation opportunities are available under the FCC's standard auction procedures.

Similarly, if the FCC is seeking a robust auction that will truly allow the spectrum to be sold at its highest value, all participants should know the identities of the other bidders, their bid amounts, and their eligibility. Particularly for smaller bidders, license valuations are based on certain factors that are dependent on the business plans of other licensees, who together provide the scale to support an interoperable ecosystem of devices, network equipment, and roaming arrangements. While a large bidder may be able to "go it alone" and may in fact be advantaged by an exclusive ecosystem, smaller bidders need to know they will have help building that ecosystem. Because these opportunities are essential for a smaller carrier's network to be economically viable, a lack of such information would create substantial risks for these bidders, likely reducing or eliminating their participation in the forward auction.

A transparent auction process is particularly important for small and regional carriers for other reasons as well. For instance, the process of valuing spectrum is extremely complex and challenging, all the more so here because of the uncertainty about what spectrum will be available in the forward auction. In this way, smaller bidders face additional risks from the use of blind bidding because they lack the more sophisticated market intelligence and analytical capabilities of the larger bidders. An open auction therefore would help to level the playing field, as well as to provide information that is uniquely beneficial to smaller bidders. For instance, because smaller bidders may have less experience with spectrum auctions and lack the resources used by large carriers in making valuation decisions, smaller bidders often find it helpful to

take note of how larger carriers value spectrum. Smaller bidders also may assign a lower value to a market in a region dominated by a few larger carriers, compared to a region with several other smaller carriers. Because blind bidding prevents these carriers from knowing this information, they face greater risks in the auction process compared to large bidders, and therefore rationally reduce their level of participation and the size of their bids. For these reasons, the information disparities created by blind bidding will have a disproportionately adverse effect on smaller bidders. Further, while blind bidding gives rise to substantial public interest harms, its advantages are largely theoretical and marginal, making blind bidding unnecessary. There have been no serious allegations of collusive bidding in recent auctions and, since the early auctions that were affected by collusion, the FCC and the Department of Justice have revised their standards and pursued enforcement actions. Moreover, publicly disclosing bidding information actually assists the FCC with enforcing its anti-collusion rules because the FCC is most likely to learn of collusive behavior by being alerted to suspicious activity by other auction participants. In contrast, when participants are denied bidding information, they are less likely to be able to identify and disclose suspicious bidding patterns.

Additional Federal and Non-Federal Auction Spectrum:

As the FCC recently noted, it is critical that additional spectrum be made available for mobile broadband in order to “help ensure that the speed, capacity, and ubiquity of the nation’s wireless networks keeps pace with the skyrocketing demand for

mobile service.”²⁸ It is for this reason that the Spectrum Act required the FCC and NTIA to take a number of actions to make additional wireless broadband spectrum available for commercial licensed use. Specifically, the Spectrum Act identified the spectrum to be withdrawn from Federal uses so that it could be allocated, auctioned, and licensed by the FCC for commercial use. It also required the FCC to auction and license additional non-Federal bands and set a February 2015 deadline by which the auctioning and licensing of all such Federal and non-Federal spectrum must be completed.

The FCC is currently preparing to hold the auctions involving three sets of spectrum that must be auctioned and licensed before the February 2015 statutory deadline, including: (i) an auction of AWS-2/H Block non-Federal spectrum commencing possibly late in 2013; (ii) 1.6 GHz reallocated Federal spectrum to be paired with unidentified spectrum commencing in 2014; and (iii) a proposed auction of 1.7 GHz reallocated Federal spectrum to be paired with AWS-3/Upper J Block non-Federal spectrum to be held in late 2014/early 2015. The following table provides additional detail regarding these auctions, which likely will be completed prior to the 600 MHz incentive auction, which is not subject to the same statutory deadline.

SERVICE	AUCTION/ DATE SEQUENCE (Estimate)	FREQUENCY	BUREAU /RULE

²⁸ See *Service Rules for the Advanced Wireless Services H Block—Implementing Section 6401 of the Middle Class Tax Relief and Job Creation Act of 2012 Related to the 1915-1920 MHz and 1995-2000 MHz Bands*, Notice of Proposed Rulemaking, 27 FCC Rcd 16258, 16259 (2012).

SERVICE	AUCTION/ DATE SEQUENCE (Estimate)	FREQUENCY	BUREAU /RULE
Auction of AWS-2/H Block PCS	4 th Qtr. 2013 Subject to resolution of technical interference issues affecting PCS spectrum	1915-1920 MHz and 1995-2000 MHz	WTB/Part 27
Auction of 1.6 GHz paired with 15 MHz of spectrum to be identified by FCC	2014 NTIA Recommended Federal Reallocation of 1695-1710 (per Spectrum Act); FCC has not identified 15 MHz for this pairing (2095-2110 MHz is an option).	1695-1710 MHz, and {as determined by FCC}	WTB/Part 27
Auction of 1.7 GHz paired with 2.1 GHz (Proposed Pairing Supported by FCC) ²⁹	Late 2014/Early 2015 Contingent on Federal Reallocation which is currently under consideration by NTIA	1755-1780 MHz, 2155-2180 MHz	WTB/Part 27

Considering the skyrocketing demand for mobile broadband services and the fact that the last FCC auction for commercial mobile spectrum took place more than five years ago, deployment of the spectrum to be offered in these upcoming FCC auctions is expected to play a critical role in ensuring that rural carriers, as well as other wireless providers, meet rising consumer demand and continue to provide the public with

²⁹The 1.7 GHz portion of the 1.7-2.1 GHz pairing will only be available for auction if it is repurposed from Federal to non-Federal uses, which the FCC requested that NTIA consider in a recent FCC letter to The Honorable Lawrence E. Strickling dated March 20, 2013. The upper half of this pairing particularly AWS-3 is required by statute to be auctioned before February of 2015.

transformative innovations. This spectrum is particularly well-suited for mobile broadband as it is adjacent to the widely-deployed PCS and AWS bands, which are used by carriers of various sizes to offer mobile service across the nation. The fact that this spectrum can be auctioned and made available for deployment sooner than the 600 MHz band also makes this spectrum uniquely valuable to rural and regional providers in meeting their near-term needs, considering that they have not been able to meet their spectrum needs through auction purchases for many years.

For the same reasons discussed above in connection with the 600 MHz incentive auction, U.S. Cellular strongly supports the competitive participation of rural and regional providers in each of these three upcoming spectrum auctions. The spectrum blocks to be offered in these auctions should not be so large as to make them unaffordable by the smaller rural and regional providers. The H Block already has a 2x5 MHz pairing, which is suitable. We recommend that a similar 2x5 MHz channel block size be uniformly implemented as the basic spectrum block size to be offered in the other two upcoming auctions. U.S. Cellular also supports small geographic license areas, such as CMAs, that match the service needs of rural and regional providers, and opposes any license area size larger than EAs. We also reiterate our opposition to the use of package bidding and blind bidding procedures in these auctions.

Universal Service Support is Critical to Improving Service in Rural Areas

We must acknowledge that consumers desire both wired and wireline services and the distribution of support under the Federal Universal Service Program needs to appropriately balance those interests in areas that are simply uneconomic to serve

without effectively managed support mechanisms. The FCC's underlying goals to reform the Universal Service Program back in 2011 are to be applauded. Although we supported the FCC's overall goals, we did not agree with all of the decisions the FCC made, and are actively asking the Commission to fine tune the Mobility Fund programs going forward. As we have stated before, consumer demand for mobile broadband continues to skyrocket. Unfortunately, the FCC's Mobility Fund auction failed to allocate sufficient resources to wireless (less than 10% of overall funding) and two-thirds less than was allocated under the legacy program that is currently being phased out. Even though it is readily apparent that consumers suffer from inadequate coverage in many rural areas across the country, the Commission failed to allocate any funding to a number of states including a significant number of the states represented on this Committee. This resulted in an unfair and uneven distribution of funds that may not reflect the true needs of consumers. Those oversights must be addressed if we hope to address the needs of rural consumers everywhere.

In late 2011 the FCC revamped the federal universal service program. Market participants from all quarters have praised and criticized the FCC's decision, and it will be another year before the U.S. Court of Appeals for the Tenth Circuit decides its fate. Today, our focus is on what the program has done, and can do going forward, to improve mobile coverage in rural areas.

How Universal Service Has Helped Rural Areas We Serve.

Historically, our government has furthered the societal benefit of ensuring that basic services are made available to all of our citizens. We are a stronger country when everyone has access to modern services. A high-quality mobile wireless network is critical to public safety, it accelerates economic development, and it ensures the viability of rural areas in the same way that water, electricity and basic telephone service did in the last century.

We have strongly endorsed the universal service program and our use of funding support over the years has delivered high-quality services to rural areas that would not otherwise have had them. To summarize, in 1997, we began applying for eligibility to participate in the universal service fund and by 2008 we were eligible in sixteen states. Using federal support, we have built well over 1000 new towers and upgraded many more in areas where we would not otherwise have built, and in areas that oftentimes had no access to wireless service. We built towers in places with just a few hundred residents. We built in remote areas of West Virginia, in eastern Washington, eastern Oregon, central Maine, central Virginia, northern Wisconsin, central and northern Missouri, central Nebraska, and many more.

In some of these areas, federal funding has helped us keep cell sites on the air when customer revenue was insufficient. We have also used universal service funds to build links between cell sites and add power generators in remote areas, providing critical redundancies that ensure continuous service during catastrophes. In every state where we are eligible, our coverage and service quality has improved commensurate with the support we received. As you might expect, we invested more in areas where we received significant amounts of support. Wherever support was made available, our

rural networks are now demonstrably better as a result, and our customers see it. I also truly believe a significant part of the company's success in J.D. Power network and Forrester customer experience satisfaction surveys is the high-quality network experience we provide in rural areas.

Investments made possible with support generate additional economic activity from local businesses. This is known as the multiplier effect. When we enter a community, it takes people to perform a myriad of jobs. Among other things, people build networks, construct stores, sell devices, and advertise our services. These are high-quality, good paying jobs. In addition, local businesses use mobile wireless service to become more efficient and to access markets around the world. This creates more jobs and local economic activity. Every place we construct a cell site is now a candidate to attract investment from business owners considering a potential move away from areas that lack sufficient telecommunications infrastructure.

The FCC's discontinued mechanism is phasing out support to participating carriers. As of July 1, 2013, our support will be reduced by 40% and by July 1 of 2016 our support will be gone. As a result of the reduction in support, we are adjusting our investments in new cell sites accordingly, reducing our capital expenditures and using remaining funds to cover operating expenses in existing rural areas we serve. At its peak in the latter part of the last decade, we were building over 200 cell sites per year with this support. This year, we're planning to construct only 35 sites and as of this date we have no plans to build additional universal service sites in areas funded by the legacy program after 2013 due to this reduction of the program's funds. We have made that painful decision because we know there simply is no business rationale to build in

areas that will never be profitable even though we know from conversations with federal officials, local officials, and consumers that there is a desperate need for those services.

In our experience, the FCC's now discontinued federal universal service mechanism was very effective in enabling us to build telecommunications facilities in rural areas. We embraced that program and successfully expanded service in ways that would not otherwise have been possible, to the benefit of rural citizens. As discussed below, we are now turning to the new FCC Mobility Fund to assist us in constructing 4G networks in rural areas.

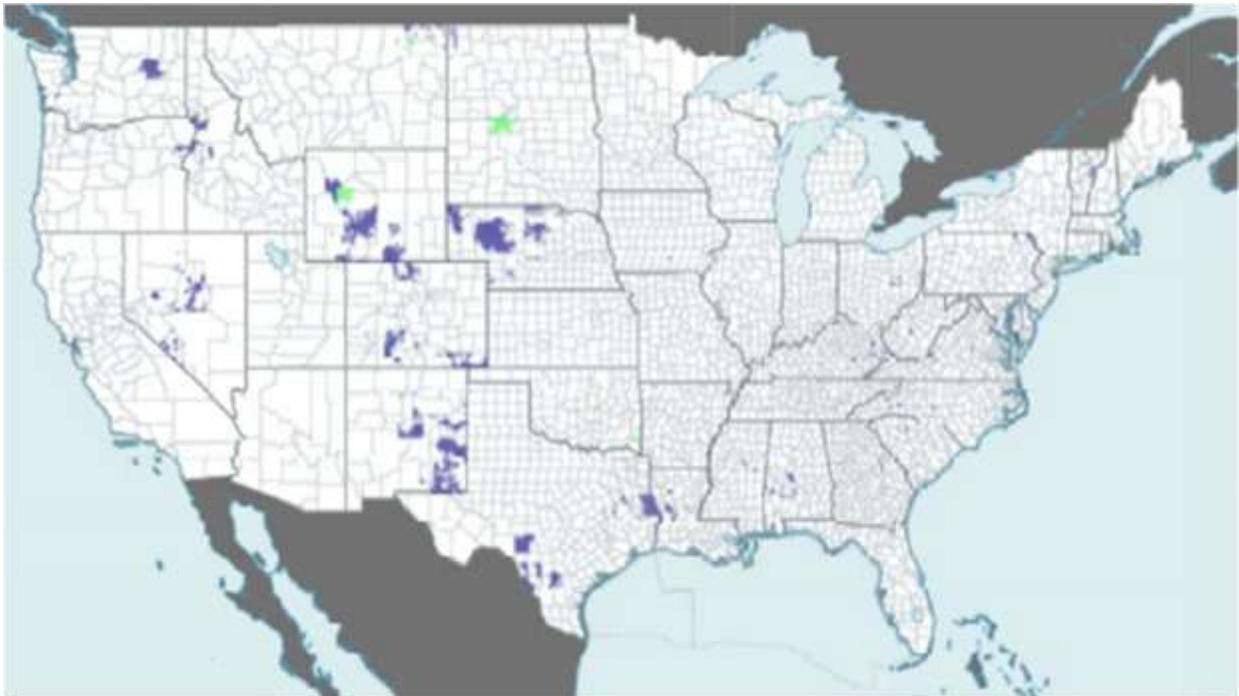
Observations on the FCC's Mobility Fund.

We participated in the FCC's first auction of mobility fund support, held in September of 2012. This auction provided \$300 million in "one time" support for eligible carriers to invest in modern 3G and 4G networks. We won the right to access approximately \$40 million in federal support, which must be used to serve 2,162 total road miles in 10 states. We anticipate that the FCC will grant our applications in the near future and we intend to implement 4G mobile broadband service in all of those eligible areas. This is a very exciting time for us as a builder of rural networks, to be able to tell rural communities that high-quality mobile broadband service is on the way.

It is important for this Committee to understand the magnitude of the task at hand for our nation. The map below, taken from the FCC's web site, illustrates where Mobility Fund Support was awarded in the Continental United States.³⁰ As you can see from the

³⁰ Support was also awarded in Alaska, however, we have not included a map here. Suffice it to say there remain significant unserved areas in places where Alaskans live, work and travel.

FCC's mapping software, the blue areas represent how small are areas that the \$300 million in Mobility Fund will cover infilling in dead zones.



When you compare this map to the one above, you get a sense of the magnitude of the gap to be bridged. The FCC's National Broadband Plan estimated that \$24 billion is needed to provide access to terrestrial broadband infrastructure for the 14 million people who currently do not have such access. If half of that gap were filled by private investment, then the FCC could finish the job of providing access in twelve years by allocating \$1 billion per year to the task. That is roughly 30% less than the FCC was providing to mobile carriers under the legacy universal service program.

My observation here is that the task of finishing ubiquitous deployment is too large for the amount of funding that the FCC allocated to mobile broadband. Rural communities can't wait twenty more years. If the Committee believes as I do that

mobile broadband is so critical, then we must bring to bear sufficient resources to cover substantially all of the area where rural people live, work and travel.

Moreover, the current Mobility Fund auction mechanism was designed to provide funds to the lowest-cost areas first, in order to maximize the number of road miles covered. While we do not dispute that there is value in the FCC's choice of how to distribute funds, it has left behind the highest-cost areas. For example, none of our bids to cover rural New Hampshire were selected, simply because we had to bid more per road mile to cover more mountainous areas in the central and northern areas of the state.

Within the next year, the FCC is expected to conduct Phase II of the Mobility Fund. It proposes to distribute up to \$500 million per year, dedicated to construction and operational support for mobile broadband infrastructure. We are active in the FCC's rulemaking proceeding that will finalize rules for how support is distributed.

We continue to oppose the use of auctions to distribute support, because while auctions may create competition in the auction room, they drive out competition in the markets themselves. We believe the better course is for the FCC to use a forward-looking cost model, as they are proposing to do in the Connect America Fund, to determine how much support is needed in a particular area, and then permit carriers to compete for that support in the marketplace, with the same construction obligations currently expected of all carriers receiving funds. In our experience, providing support only to the service providers that consumers choose drives greater efficiency, investment and competition. We support a mechanism where carriers charge a market price and consumers receive a credit for any service they choose. The carrier with the

most efficient cost structure, lowest prices, and best services would have the advantage, as they should in a normally functioning marketplace.

In sum, our observation is that basic economic forces apply here. It costs more to serve some areas and policy makers must seek efficient providers to deliver services at the lowest possible cost. Without additional funding and increased efficiency, the higher cost areas are going to be left behind for a substantial period of time. We therefore urge both the Congress and the FCC to reassess the task at hand and set a goal to deliver mobile wireless coverage to substantially all of rural America within ten years.

Suggestions for Increasing Program Efficiency.

At the outset, it is important to note that the FCC has decided to reduce universal service funding for mobile broadband by two-thirds, at a time when consumer demand for mobility is skyrocketing and when the coverage maps show much work left to be done.

We are mindful of the program's financial constraints and competing policy interests. So, we are suggesting ways to increase funding for mobile networks without increasing the overall fund.

First, there is approximately \$185 million of unused support from the Connect America Fund Phase I program. Some \$300 million was offered to telephone companies and only \$115 million was accepted. The rejected funding lies fallow. The FCC could easily add that \$185 million to the Mobility Fund, where wireless carriers are ready, willing and able to deploy service to rural areas and their bids to serve additional

areas of Rural America went unfunded. We ask for your support in getting those funds invested in rural areas at the earliest possible date.

Second, we would support the same result for any funds that may be rejected by winners of the Mobility Fund Phase I auction. If any winning bidder does not follow on auction bids, the funding can be distributed to fund the bids that were not accepted at the initial auction. Rural areas where bidders, including us, sought funding to construct would see immediate benefits.

Third, in the new Connect America Fund for wireline carriers, the FCC adopted a Right of First Refusal (“RoFR”) which allows the largest carriers to accept an amount of support offered by the FCC for five years, without competition. We have opposed this from the very beginning, because reserving support for one class of carrier for five years will inevitably confer enormous market power on that carrier.

Here is the worst thing about the RoFR: ***A large wireline carrier that also owns wireless licenses can meet its wireline build out obligations by building a 4G wireless network.*** That is, the FCC will provide exclusive support to a wireline carrier based on the costs of building a wireline network, but if it is more cost effective to use 4G wireless, the carrier is free to do so and to pocket the windfall. Ironically, the FCC just rejected this methodology for distributing support when it did away with the identical support rule for wireless carriers.

There is no public benefit to segregating support to one carrier in a market, and then allowing that carrier to build without competition. As explained by William P. Rogerson, Professor of Economics at Northwestern University and formerly the FCC’s

Chief Economist, limiting universal service support to a single carrier in a market may create:

very powerful competition *for* the market that can be used to drive down the price of the subsidy that government pays. However, the cost of creating this very powerful competition *for* the market is that after a winner is declared, there will be a significant reduction in competition *within* the market for customers. . . . It is local competition among competing carriers that creates powerful ongoing incentives for firms to charge lower prices, to improve their quality of service and level of coverage, and to introduce new advanced services as rapidly as possible.³¹

Our position represents healthy competition policy because it extracts efficiency from the marketplace: The FCC should immediately do away with the RoFR and allow any carrier willing to take on the universal service obligations to compete for customers and support. If a competitor can deliver broadband to an area for less money than another carrier, why should the government fund the less efficient provider?

There is no valid public policy rationale supporting the FCC's RoFR decision and we urge the committee to ask the FCC to reconsider this policy, as a way of stretching program dollars much farther in rural areas and ensuring that universal service mechanisms do not drive out competition in rural areas. The costs of imposing antiquated monopoly-era price regulation in areas where competition fails are very high and in the end consumers are not well-served.

Infrastructure Built With Support Can Be Leveraged to Accelerate Construction of a Nationwide Interoperable Public Safety Network.

³¹Ex Parte Letter from David A. LaFuria, Counsel to U.S. Cellular, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-51, *et al.*, filed Jan. 28, 2010, Enclosure, William P. Rogerson, "Problems with Using Reverse Auctions To Determine Universal Service Subsidies for Wireless Carriers," Jan. 14, 2010 (prepared for U.S. Cellular) at 6-7 (emphasis in original). <http://apps.fcc.gov/ecfs/document/view?id=7020384141>

All of the above actions we recommend are intended to increase construction of new towers in rural areas. They will also accelerate deployment of a nationwide interoperable public safety network. For U.S. Cellular's part, we want to see the public safety network constructed as soon as possible, and we can help. The FCC has mandated that all towers we build with support must be made available for collocation – that is – we must permit others to install antennas on our towers at a reasonable cost. In rural areas, we can think of no better way to leverage the government's investment in our towers through universal service than to collocate public safety transmitters that will enable first responders to deliver critical health and safety benefits to rural citizens.

In closing my testimony on universal service, we urge Congress to continue to support policies that promote access to high-quality mobile networks so that rural citizens receive the public safety and economic development benefits already available to urban citizens. Although we sometimes disagree with how the FCC has implemented the National Broadband Plan, we agree completely that federal universal service funds must be used to invest in our nation's broadband infrastructure, both mobile and fixed. With these investments, rural areas will have access to the most powerful economic development tools of the new century. Without them, there will be a flight of capital and talent toward only those areas that are connected.

Infrastructure Deployment is Critical to Rural Citizens.

The era of mobile broadband is now exploding upon us, with an incredible array of devices enabling our citizens to do truly amazing things. Throughout the country,

wireless carriers are deploying 4G networks that enable our citizens to access email, applications and the Internet at download speeds that are supersonic compared to the 2G networks deployed a decade ago. Even faster speeds are on the near-term horizon.

Anyone who owns one of the latest 4G enabled smartphones knows how amazing they are at these speeds. But this growth in appeal and usage presents a critical challenge as well: In the U.S., wireless data traffic has increased by 486 percent from the second half of 2009 to the first half of 2012 and demands for capacity are going to continue to escalate, meaning we cannot rest on our current achievements or infrastructure. We must continually build and upgrade to keep the US consumer at the cutting edge of technology and innovation.

Smartphones are increasingly considered to be a necessity by consumers across the country. Over the past three years, American smartphone adoption has increased from 16.9 percent to 54.9 percent. and smartphones currently account for 133 million of these devices. By 2014, the number of smartphones used by consumers in the United States is projected to exceed the number of consumers' personal computers by more than 200 million units.

Widespread consumer adoption of mobile broadband has also fueled rapid growth and innovation in mobile applications. For example, the number of applications available at the iPhone App Store has grown 1,900 percent from April 2009 to September 2012, and the number of Android applications reached 700,000 in the fourth quarter of last year. To take another example, a recent study forecasts that within the next five years about 50 percent of all new car radios sold in the North American market will feature downloadable apps.

Among low-income households, many of whom cannot afford multiple subscriptions, the primary means to access the Internet is a high-speed mobile device. For example, the Center for Disease Control's June 2012 report shows that 51.4% of adults living in poverty lived in households with only wireless telephones, compared with 39.6% of adults living near poverty and 28.9% of higher income adults.

These are startling facts which begs one of the main questions we confront as a company and government must confront in its policy analysis. How can we ensure that these high-speed networks and incredible devices are not available only in urban and suburban areas? I'm sure each member of this committee has traveled in rural areas within your respective states where coverage is lacking, service quality is poor, and modern 4G service is unavailable.

As you know, rural economic development increasingly depends upon the availability of high-speed mobile broadband. Just a few weeks ago at the Mobile World Congress in Barcelona, one of the keynote speakers reported that in developing countries a 10% increase in mobile data penetration is associated with a 1.21 to 1.38% increase in GDP. Every 4G cell we build multiplies economic activity and increases consumer welfare in its coverage area. In areas receiving improved coverage, E911 and location-based services save lives and enable critical communications. In areas where a competitor enters, consumers receive improved service and greater choices.

As shown in the FCC's National Broadband Map, high-speed mobile wireless service (>6 MBps) is now available in many urban areas, but not in most rural areas. There remains a lot of work to do to provide rural citizens with service quality that is reasonably comparable to that which is available in urban areas, as envisioned by the

1996 Telecom Act. Many communities can receive service from only one wireless provider and citizens living in these areas do not receive the benefit of competitive choice. We therefore urge the adoption of policies that could increase competition and reduce the need for monopoly-era regulatory structures. These better policies include allocation of more spectrum, the use of small geographic license areas, promoting market-based universal service mechanisms, increasing interoperability of devices, as well as other reforms which we have not focused on here today but which are important, including interconnection rights and special access reform.

Conclusion

In conclusion, the challenges that we face are not insurmountable. Companies like U.S. Cellular have it in their business DNA to bring great communications services to the people of rural America.. The issue is how we can ensure that the regulatory regime that governs the market place is sensitive to the business challenges of serving markets where a piece of equipment that might serve 250,000 people in an urban market may serve just a few thousand or a few hundred. Government support may be necessary in some instances where the economics will never work for the private sector to invest alone, but ensuring that rural service providers have meaningful access to spectrum, have interoperability standards that make devices truly affordable, and that middle mile and backhaul services are at reasonable rates, all play a critical role in maintaining a healthy and robust industry.

Your time and attention to each of these items is extremely important for your constituents and our consumers and I thank you for inviting me to appear before you today.