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MOBILE NOW and AIRWAVES Create an Essential Spectrum Pipeline: Free Market Principles Should Guide Spectrum Policy

by

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Introduction and Summary

The political logjam over Senate passage of MOBILE NOW finally has been broken. The Senate is to be commended for this forward-looking, bipartisan move to advance reallocation and assignment of spectrum for licensed and unlicensed mobile broadband use. The legislation would require the government to allocate more spectrum for wireless broadband use, particularly in light of burgeoning 5G demand. I urge the leadership in the House of Representatives to advance similar legislation to accommodate marketplace and technological developments that will benefit consumers and the nation's economy. And the MOBILE NOW legislation can be even further buttressed by adoption of legislation like the more recently introduced AIRWAVES Act that would create a sorely needed, timely spectrum pipeline.

To its credit, the Federal Communications Commission (FCC) for its part has been moving to reallocate further spectrum for mobile broadband use even without such legislation. From continuing work on additional high-band spectrum, to exploring mid-band spectrum reallocation, to evaluating modifications to the 3.5 GHz Citizens Broadband Radio Service (CBRS) rules, to proposing potential reformulation of the 5.9 GHz Dedicated Short Range Service spectrum

(DSRC), the Pai Commission has not wasted any time in advancing the Commission's spectrum agenda. These pro-consumer spectrum initiatives can be supported and advanced by MOBILE NOW and the AIRWAVES Acts.

It is important that the 39-month deadline for completing the 600 MHz incentive auction spectrum repacking plan remain firm. The 39-month period is the time allotted for television broadcasters to transition off their current assignments so the auctioned spectrum can be used by the winning wireless bidders. Adhering to the repacking deadline will allow the 600 MHz spectrum to be put to use to serve more wireless customers on broadband LTE networks. And it will enable the roll-out of advanced broadband 5G networks, including in previously unserved rural areas, such as the ones that T-Mobile has announced that it is targeting for early service. Congress and the FCC should recognize the importance of adhering to the 39-month repacking deadline, which, after all, was part of the bargain considered by bidders in the incentive auction.

Although the Obama Administration announced the goal of reallocating 500 MHz of additional spectrum for mobile broadband use, that laudable initiative veered off the rails with an overemphasis on commercial-government sharing of spectrum. The effort sputtered and almost collapsed with the November 2016 National Telecommunications & Information Administration (NTIA) Quantitative Assessment of Spectrum Usage report that seemed to indicate government had run out of ideas and motivation to proceed.

To its credit, the Wheeler FCC likewise achieved some important milestones in the spectrum reallocation effort. But it made some unfortunate choices when it created stultifying rules for use of 3.5 GHz and established skewed bidding procedures for the broadcast incentive auction.

Now that spectrum reallocation efforts may be on a better course, with a new FCC and an Administration interested in promoting infrastructure investment and jobs, it is a good time to take stock with what has gone wrong with spectrum auction and assignment decisions in the past. Not surprisingly, failure to adhere to free market principles is often at the root of spectrum reassignment problems. These past mistakes fall into the following categories.

- Significant license conditions can create an auction failure.
- Skewing the incentive auction to favor certain bidders can undermine competition and reduce auction receipts below what they otherwise would have been.
- Designated entity rules are not achieving diversification in spectrum holdings.
- Restrictive licensing rules can undermine the usefulness of spectrum allocations.
- Overemphasizing government sharing requirements impedes spectrum usefulness.

Establishing assignment and bidding practices that incorporate, whenever possible, free market principles will more efficiently assign frequencies to the highest and best use, will maximize spectrum auction revenues, and thus advance overall consumer welfare and economic growth.

MOBILE NOW Is a Forward-Looking Accomplishment

Commendably, on August 7, 2017, the Senate unanimously passed the MOBILE NOW Act, S. 19, legislation that would:

- Mandate that at least 255 MHz of spectrum below 6 GHz be allocated for wireless mobile and fixed broadband use no later than December 31, 2020, in line with the Obama Administration's 2010 500 MHz allocation goal;

- Require a feasibility study for reallocating six specified bands above 24 GHz, and an FCC NPRM proposing reallocation of such bands where warranted within two years of enactment;

- Require government to conduct a feasibility study for commercial-government sharing of spectrum between 3.1 and 3.5 GHz and between 3.7 and 4.2 GHz;

- Facilitate speedy deployment of communications infrastructure on federal property;

- Require NTIA to report recommendations to Congress that would provide incentives to federal agencies to relinquish or share the spectrum they use;

- Require NTIA to study bidirectional sharing that would permit government to gain flexible access to commercial spectrum on a shared basis; and

- Require the FCC to adopt rules permitting unlicensed mobile use of spectrum in guard bands.

MOBILE NOW promotes infrastructure development, economic growth, and American jobs in line with major Trump Administration priorities and should be enacted into law. This long-awaited Senate development now moves the ball over to the House of Representatives' court. House Telecom Subcommittee Chairman Marsha Blackburn (R-TN) already held an April 4, 2017, hearing on spectrum allocation, and she has indicated her committee is ready to move on this issue. Given MOBILE NOW's bipartisan genesis, and the expressed intentions of both House members and the Department of Commerce, I hope the measure will swiftly be enacted into law.

The Senate already has begun to look beyond MOBILE NOW. The Advancing Innovation and Reinvigorating Widespread Access to Viable Electromagnetic Spectrum (AIRWAVES) Act, S. 1682, introduced by Senators Cory Gardner (R-CO) and Margaret Hassan (D-NH), seeks to improve on some of the provisions of MOBILE NOW by:

- Identifying specific mid- and high-band spectrum and establishing definitive deadlines on reallocation and auctioning of these spectrum bands;
- Requiring NTIA to issue a report by the end of 2020 on the relocation of federal operations in certain spectrum bands; and
- Earmarking 10 percent of proceeds from auctions for the deployment of wireless infrastructure in underserved and unserved broadband service.

Because spectrum reallocations from government to commercial use take such a long time, putting government's feet to the fire to move along such reallocation and assignment efforts will clearly benefit the American consumer and the U.S. economy.

The FCC and Congress should recognize the importance of adhering to the 39-month deadline for completing the 600 MHz incentive auction spectrum repacking plan. The 39-month period is the time allotted for television broadcasters to transition off their current assignments so the auctioned spectrum can be used by the winning wireless bidders, and it was part of the auction bargain considered by the bidders. Adhering to the repacking deadline will allow the 600 MHz spectrum to be put to use to serve more wireless customers on broadband LTE networks. And it will enable the roll-out of advanced broadband 5G networks, including in previously unserved rural areas, such as the ones that T-Mobile has announced that it is targeting for early service.

FCC Actions Are Already Moving to Achieve the Promises of 5G

The FCC has redoubled its own efforts to reallocate spectrum for wireless broadband use, accelerating what was previously achieved under the Wheeler Commission. The Pai Commission continues the exploration for more high-band spectrum in the *Spectrum Frontiers* proceeding.

The Commission recently opened an inquiry to explore further reallocation of mid-band spectrum between 3.9 GHz and 24 GHz. In that inquiry, the Commission identified specific bands, with varying numbers of existing licensees and types of users. It asked questions about whether existing licensees can be moved to other bands, or whether there is a viable method of sharing among commercial interests in those bands.

The FCC recently consolidated vehicular and other radar operations in a contiguous 76-81 GHz band. That effort adds additional spectrum to support growing innovation in vehicular automation. It also possibly aids in resolving the issue of whether to reallocate or add additional users in the 5.9 GHz band, currently allocated to the DSRC. In 1999, the FCC originally slated the band for intelligent communications systems and vehicular automation, but little use has yet to materialize in the United States.

The Wheeler Administration's allocation of 100 MHz of spectrum for the CBRS has been subject to serious controversy from the outset. The complex licensing scheme reserved some spectrum for both licensed and unlicensed use. The licensed spectrum rules have been criticized because the licenses are of relatively short duration and rely on permanent sharing with government users that have large exclusion zones in some frequency ranges. Fortunately, Chairman Pai has promised to reexamine the licensing rules in light of these criticisms, an effort in which Commissioner O'Rielly has taken a personal interest. Given that these discussions are ongoing, it is too early to tell whether these efforts will bear fruit.

NTIA's role in the search for additional spectrum has been lackluster in recent years, as Free State Foundation President Randolph May and I said here. Secretary of Commerce Ross has indicated that NTIA must exert more leadership to promote government efficiency in its use of spectrum. He needs, however, the help of a strong Administrator to advance those efforts, which

can be expected with Trump nominee David Redl, a veteran of the spectrum issues as Chief Counsel on the House Energy and Commerce Committee.

Spectrum Reallocation and Assignment Rules Should Reflect Free Market Principles

With all the promising reallocation steps outlined above, government should refocus its efforts regarding how it will conduct the auction and assignment phases. Although I am encouraged by the free market orientation of Chairman Pai, Secretary Ross, and Administrator-in-Waiting Redl, government should rededicate itself to make spectrum assignment more efficient in a way that maximizes use and value to mobile consumers. Some past poor choices provide lessons that should inform these future efforts.

Significant license conditions can create an auction failure. The FCC should avoid adding significant conditions on the use of spectrum licensed pursuant to auctions other than engineering rules necessary to promote efficient and interference-free use of the frequencies. Conditions that are designed to promote specific non-engineering-related political or policy goals tend to undermine spectrum efficiency and value.

The first Advanced Wireless Service spectrum auction (AWS-1) was a case in point. The 700 MHz D Block auction contained a restriction that the spectrum be dedicated to jointly providing a First Responder Network and private mobile spectrum, including a minimum bid amount. The cost uncertainties surrounding this obligation most probably caused the failure to achieve the minimum bid amount. That spectrum is still not used ten years later, but it is now slated for exclusive government use by the Middle Class Tax Relief and Job Creation Act. A proposal to build out the 700 MHz spectrum licensed to FirstNet, the independent authority within NTIA tasked with deploying a nationwide broadband network for first responders, finally is now completed and circulating among the states for their consideration of whether they will participate.

The C block of the same auction contained an "open access" requirement that obligated the auction winner to permit any device or application to be operated on the spectrum. These requirements have been compared to, but were broader than, the 1960s-era *Carterfone* decision that required a traditional telephone company to allow a customer to use any device not harmful to the network. At the time of the auction, it was persuasively argued that the eventual auction price was $3.1 billion (or at least 40 percent) lower than it otherwise would have been without the open access restriction.

Skewing the incentive auction to favor certain bidders can undermine competition and reduce auction receipts. Auction eligibility rules should not be imposed in a discriminatory fashion. Tipping the scales in favor of certain bidders with certain bidder characteristics runs the risk of reducing auction revenues and arguably interferes with competition by artificially raising the costs of certain market participants over others. The incentive auction “reserved spectrum” rules are possibly a case in point.

The now completed incentive auction was designed to permit broadcasters voluntarily to give up over-the-air broadcast spectrum in the "reverse" portion of the auction in exchange for part of the proceeds in the "forward" portion of the auction. The FCC created "reserve spectrum," (up to 30 MHz) available only to bidders with less than about a third of below-1 GHz spectrum in a geographic market. As I indicated, here and here, no bidding preferences would be more consistent with maximizing both participation and incentive auction revenues.
For another recent example, look north of the border. The Canadian government reported that its March 2015 AWS-3 auction yielded only $2.2 billion. The largest carrier opted out of participation altogether. The skewed Canadian auction resulted, according to one assessment, in a cost of about 11 cents per MHz/pop for the favored bidders, while Telus paid $3.02 per MHz/Pop and BCE paid $2.96 per MHz/Pop (numbers two and three in the market).

Designated entity rules are not achieving diversification in spectrum holdings. For a number of years, the FCC has employed "designated entity" rules that give certain small bidders significant bidding credits. These designated entity rules are intended to promote the ability of smaller companies to participate and be awarded licenses in competition with entities that are presumed to have greater financial resources. They seek to promote licensee and service diversity, as well as promote small business. While a number of such "designated entities" have in fact been awarded licenses, it is debatable whether the rules result in the policy goals sought to be achieved.

To promote participation by small businesses, the entrepreneur block of the PCS auction (also termed the C block) was reserved for companies that had less than $125 million in annual revenues and $500,000 in assets. A study by Fred Campbell has shown that the restrictions produced 61 percent less revenues than later unrestricted PCS auctions achieved. This same study and another by Tom Hazlett and Babette Boliek demonstrated that the restriction seriously delayed license grants, with many licenses tied up in bankruptcy for years. Over half of the licenses had to be returned to the government. And perhaps most significantly, Mr. Campbell's study showed that the restriction did not increase the long-term participation of small businesses, which largely transferred their licenses to existing players in the after-market. This, of course, meant that taxpayers were not fully compensated for the spectrum because the entrepreneurs effectively received part of the proceeds.

The jury is still out on a more recent example. In the AWS-3 auction, DISH, too large to qualify for bidding credits, owned 85 percent of two designated entities, Northstar Wireless and SNR Wireless. Eventually, the FCC refused to uphold the bidding credits, concluding that DISH controlled the entities, which made them ineligible for bidding credits. As a consequence of that FCC decision, the two entities defaulted on their payments for $3.5 billion of the total amount bid. Northstar and SNR Wireless appealed the denial of bidding credits to court. The D.C. Court of Appeals decision issued last week was a mixed result for the FCC and the companies, holding that the FCC was correct that the entitles were not entitled to the credits, but remanded because agency precedent required that the FCC allow the entities to reform their agreements to conform to the rules. It is unclear at this point how the FCC will resolve the remand, but it is certain that the licenses are still subject to significant uncertainty and delays other auction licenses did not suffer.

Caution should be exercised in evaluating the designated entity rules. A significant exception to the observation that the goals of the rules are not being achieved are licenses awarded to affiliates of rural telephone companies, which often deploy and operate wireless services in their wireline service territories. But, in large part, while it is true that more entities can promote competition in the market for wireless services, creating skewed auctions has not significantly changed the competitive landscape nationwide.

Narrow licensing rules can undermine the usefulness of spectrum allocations. There is no question that the FCC has improved spectrum assignments by creating flexible use, market-oriented spectrum allocations, rather than narrow licenses for specific classes of users. When government selects specific business or business models for favored treatment, market failures often result because these government decisions are driven by politics and the policy du jour. The wisdom of the flexible use principle is buttressed by the fact that past allocations for narrowly-specified have been overtaken by market or technological change.

A variant on this theme recently occurred when the FCC created CBRS in the 3.5 GHz band. The CBRS rules established rules for licensed and unlicensed spectrum for general broadband service, but the licensing rules were very restrictive and unusual in the mobile broadband context. Dubbed the "innovation band," the FCC posited that its licensing rules would promote flexible use by a wide variety of potential entities. But the licensed spectrum tier for CBRS is too low power and license terms are too short (up to three years without a renewal expectancy) to be reliably usable for the mobile broadband networks that most consumers need, a point which has been highlighted by CTIA. And, as reported by NTIA, significant carve-outs exist in some portions of this band in geographic areas where government users will be permanently protected from interference, mostly along the U.S. coasts where a large percentage of Americans live and work.

In a welcomed sign, the FCC is now looking into whether some of the CBRS licensing rules can be modified. Until further public action is taken, however, it is too soon to tell whether the Commission is heading toward a more market-oriented approach to the 3.5 GHz band.

Overemphasizing government sharing impedes spectrum usefulness. Although sharing of spectrum allocations can improve the cooperation of existing users to allow new users to operate in existing spectrum bands, the difficulties of sharing and lack of technological break-throughs make the benefit of permanent sharing unproven. I have addressed here the problems with sharing spectrum between commercial and government users. Inevitably sharing reduces the available usable spectrum and the flexibility and reliability that commercial users need to deploy services that consumers want. A number of these sharing problems also can exist among commercial users. There are five serious problems with sharing.

First, by definition, sharing is inherently inefficient to some degree, absent perfect coordination conditions difficult to achieve in the real-world. And some are concerned that, in many instances, government is utilizing inefficient, outdated technology. Although modern dynamic sharing technologies, with more refinement, show promise, such technologies are still unproven in many cases.

Second, sharing spectrum undermines investment incentives by increasing costs and potentially reducing reliability. Some have noted that sharing inevitably increases carrier costs through ongoing coordination and operational work-around requirements, costs that ultimately must be borne by consumers.

Third, sharing requirements reduce potential auction revenues because the market will devalue spectrum saddled with significant limitation, as I detailed here.

Fourth, ongoing sharing among sensitive national security and law enforcement systems and commercial operations may pose continuing security concerns to government operations.

Conclusion

The Senate is to be congratulated for passing MOIBLE NOW. This legislation, if passed by the House and signed by the President, would advance the promise of mobile broadband for all Americans. Legislation like the AIRWAVES Act could keep government's feet to the fire by establishing a sustainable spectrum pipeline. As the spectrum reallocation efforts move forward, the FCC as the licensing body should pay close heed to history in order to learn from past mistakes. Establishing assignment and auction practices that reflect free market principles will lead to more efficient assignment of frequencies to the highest and best use, will maximize spectrum revenues, and, at the same time, advance consumer welfare and boost the nation's economy.

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