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Before the
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Commerce, Science and Transportation

“The 5G Workforce and Obstacles To Broadband Deployment”

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**HEARING ON
“The 5G Workforce and Barriers to Broadband Deployment”**

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Chairman Wicker, Ranking Member Cantwell, thank you for inviting me to testify today on this timely and important topic.

America has led the world in wireless technology and innovation for over three decades. The secret to our success has been our ability to strike the right balance among the elements that create our dynamic and innovative wireless ecosystem. Congress has struck a balance between the role of the Federal Communications Commission (FCC) in setting national policy and the role of the states in protecting the interests of their residents. Congress has struck a balance between the need for both exclusively licensed spectrum auctioned to carriers and unlicensed spectrum open to everyone. Within auctions, Congress has struck a balance among competing public policy goals such as competition, protecting incumbent services, protecting federal services, and ensuring a pipeline of sufficient spectrum in a variety of frequency ranges for new deployments. While the FCC makes the policy choices in the first instance, it does so subject to the balance struck by Congress.

Maintaining this balance is critical to our continued leadership in wireless. We do not pursue a “flavor of the month” or crisis management approach. Our spectrum policy depends on a combination of innovation and reliability that recognizes the importance of all stakeholders throughout the supply chain. As a result, we do not simply lead the world in deployment of millimeter wave technology and 5G generally. American companies such as Qualcomm lead in the development of microchips that provide the essential guts

of wireless hardware. Apple and Google lead the world in development and deployment of wireless operating systems. While no one should take this leadership for granted, it is a testament to the importance of maintaining a steady and balanced spectrum policy.

Unsurprisingly, stakeholders routinely emphasize the importance of their contribution and push the FCC and Congress to put a thumb on the scale to favor their specific needs. For example, during the roll-out of 4G technology, the wireless industry repeatedly pushed the idea of a “spectrum crunch” that would make widespread adoption of 4G impossible and cede U.S. leadership in wireless to other countries.¹ Then, as now, wireless networks and their industry allies warned that unless Congress and the FCC acted immediately to provide wireless networks with their wish list, the United States would fall behind in the “race” to 4G. Fortunately, Congress recognized the importance of maintaining a proper balance among stakeholders. While adopting new innovations such as incentive auctions, Congress resisted the urging of wireless networks to radically preempt states or to eliminate allocations for unlicensed spectrum. As a consequence, U.S. leadership in wireless remained intact.

As we confront the challenges to 5G deployment going forward, Congress should look at the “5G race” and predictions of doom with a jaundiced eye. Globally, the demand for new mobile services is driving rapid deployment of 5G without the need for Congress or the FCC to alter the balanced policies that have served us so well over the last three decades.² While we can expect wireless providers to highlight every successful

¹ David Talbot, “The Spectrum Crunch That Wasn’t,” MIT Technology Review (November 26, 2012). Available at: <https://www.technologyreview.com/s/507486/the-spectrum-crunch-that-wasnt/>; See also Tim Farrar, “The myth of the wireless spectrum crisis,” GIGAOM (October 21, 2012). Available at: <https://gigaom.com/2012/10/21/the-myth-of-the-wireless-spectrum-crisis/>

² Juan Pedro Tomás, “Qualcomm sees faster than expected 5G global deployment,” RCR Wireless (December 9, 2019). Available at: <https://www.rcrwireless.com/20191209/5g/qualcomm-sees-faster-than-expected-5g-global-deployment>

deployment abroad as a “danger to U.S. leadership,” we should not lose sight of the long-term steady pace of deployment here in the United States. Wireless networks are already busy deploying 5G networks without the need for additional incentives. The idea that a few months of delay of a particular auction dooms us to live in China’s wireless shadow, or that the need to negotiate with local communities to protect local quality of life and ensure that the benefits of 5G are distributed equally to all Americans will cause deployment to grind to a halt, should be dismissed as nothing more than the usual high-pressure lobbying by incumbents eager for any advantage.

While framing deployment of 5G as a “race” with other nations is a potentially useful metaphor to emphasize the importance of 5G as an area of policy, we should not confuse this with a literal race to see who can deploy the greatest coverage most quickly. As we have seen repeatedly over the last 30 years of wireless development, who is “ahead” for some transient period of time while the rest of the world “catches up” is a meaningless statistic. Standards are global, as is the market for wireless. Qualcomm and other U.S. equipment makers compete for market share across Asia, Europe and South America. To the extent China poses a threat to U.S. dominance, it comes from China’s structural advantages: a large captive market, state subsidies and a willingness to steal technology it cannot develop on its own. Whether a spectrum auction happens a few months earlier or a few months later makes no difference in the overall scheme of things.

Of course, there is a difference between policy “balance” and “complacency.” Below, I highlight several areas where the Congress should act to preserve the necessary balance and resist the efforts of wireless networks to push the panic button to gain

unwarranted – and ultimately detrimental – concessions. Nevertheless, to the extent we must characterize the deployment of 5G as a “race,” we should recognize it is not a sprint but a marathon – and one we are leading quite handily. Even CTIA, which has the most to gain from pushing the panic button on policy, now agrees that the United States has pulled ahead of countries such as South Korea and is once again “leading the 5G race.”³ What is important is getting the policy balance right, not adopting wrong policies as quickly as possible.

Workforce Issues: Opportunities for Local Training and Job Creation.

Every transition from one wireless network standard to another creates a demand for tower climbers. However, there is currently a severe skills gap – meaning there are not enough trained tower climbers to meet industry demand.⁴ One way to meet the demand for tower climbers is to increase funding for work-based learning programs in tower climbing. These programs are well-suited towards individuals living in communities of color, or rural communities with relatively high unemployment rates and relatively low incomes. Many unemployed or under-employed individuals do not have the resources to support their families while they train for a new career. Work-based learning programs enable these individuals to train for a better future while supporting their families because these programs help students learn necessary skills while on-the-job. Work-based-learning programs also benefit employers, who are able to train employees for their exact needs.

³ Jeremy Horowitz, “CTIA: U.S. and China Lead Global 5G Race, followed by South Korea,” VentureBeat (April 2, 2019). Available at: <https://venturebeat.com/2019/04/02/ctia-u-s-and-china-lead-global-5g-race-followed-by-south-korea/>

⁴“The Surge for Tower Climbers to Build a 5G Network,” 3M (July 24, 2019), <https://workersafety.3m.com/surge-tower-climbers-build-5g-network/>.

Moreover, it is important to note that because demand is cyclical, the short-term demand generated by the need to build out 5G infrastructure does not ensure long-term employment for workers. As a consequence, programs designed to meet the shortage of tower workers need to look not merely to training and safety,⁵ but also to guaranteeing to tower workers a productive future after the current boom subsides. This applies not merely to tower climbers, but to other job opportunities that will follow in the wake of deployment. Papers from the Joint Center for Political and Economic Studies⁶ and Brookings Institution⁷ highlight the unique opportunity that 5G deployment provides for local communities to work with network providers to create local jobs and address long-standing issues of digital inequity. Carefully thought-out federal policies designed to address not simply the immediate short-term need, but also the post-5G deployment world, can have positive long-standing impact on local communities and the American tech workforce. Congress should resist the rush to look only to the immediate short-term labor needs and consider what systemic programs and work-based-learning programs can create good local jobs in traditionally marginalized rural communities and communities of color.

⁵ Tower climbing remains an extremely dangerous job. *See* US Tower Structure Related Fatalities, <http://wirelessestimator.com/content/fatalities>. A rush to hire new climbers must not result in reduced safety training or fewer safety precautions. The FCC and OSHA must continue their oversight of this vital job to ensure that worker safety remains paramount. *See* OSHA: Communications Towers, <https://www.osha.gov/doc/topics/communicationtower/>.

⁶ Yosef Getachew, Alejandra Montoya-Boyer, and Spencer Overton, “5G, Smart Cities and Communities of Color,” (Joint Center for Political and Economic Studies 2017). Available at: <https://jointcenter.org/5g-smart-cities-communities-of-color-2/>

⁷ Nicole Turner Lee, “Enabling Opportunities: 5G, the Internet of Things, and Communities of Color,” (Brookings 2019). Available at: <https://www.brookings.edu/research/enabling-opportunities-5g-the-internet-of-things-and-communities-of-color/>

Local Governments Are Partners, Not Barriers.

We need not merely 5G network deployment, but 5G adoption. Historically and consistently, the rate of local adoption depends heavily on close relationships with local communities. When providers work with local communities, it creates important relationships and trust, which help spur adoption. When networks run roughshod over local communities, it generates resentment and resistance.

In 1993, as part of the revisions to the Communications Act that made the dramatic growth of mobile technology possible,⁸ Congress carefully considered what powers to leave at the local level and what to permit the FCC to preempt to promote wireless deployment. Congress explicitly left zoning, health and safety regulation to the states.⁹ Unfortunately, wireless networks have consistently urged the FCC to preempt local authority that Congress explicitly chose to preserve. Despite a lack of any record evidence that preemption in the name of “streamlining” has positive impact on deployment, the FCC has proven unfortunately responsive to these industry demands.¹⁰ Congress should not merely reject calls from the wireless industry for further ‘streamlining,’ but should affirmatively roll back the FCC’s preemption overreach.

History shows that preemption of local authority does nothing to encourage deployment on a national basis. To the extent that localities engage in significant negotiations to protect local interests such as historical landmarks or ensure service to the entire community, they have every right to do so. After all, it is members of local governments, not representatives of carriers, who live in the community and are

⁸ See Omnibus Budget Reconciliation Act of 1993, Pub. L. 103-66.

⁹ See 47 U.S.C. §332(c)(7).

¹⁰ “Public Knowledge Response to Opposition to Public Knowledge’s Petition for Reconsideration and Motion to Hold in Abeyance,” WC Docket No. 17-84 (Filed October 15, 2018).

accountable to local residents. The history of cable franchise preemption demonstrates that preempting local governments allows carriers to short-change poorer neighborhoods and rural communities. For example, despite FCC “streamlining” of local franchise authority to encourage cable competition in 2006,¹¹ and additional “streamlining” of local franchising authority on the state level, urban neighborhoods and rural communities continue to lack access to affordable broadband.¹² Indeed, urban areas have seen the return of “redlining,” with broadband providers simply failing to spend money to upgrade systems in communities of color.¹³ Similarly, rural communities have seen deregulation lead not to investment, but to ongoing problems with rotting legacy copper lines as deregulated carriers simply decline to invest in rural communities with low rates of return.¹⁴

For all these reasons, Congress should ignore the claims of wireless networks that without further preemption of local authority, America will “lose the race to 5G.” To the contrary, by giving carriers free reign over local deployments, we will see large swaths of urban and rural America cut out of the 5G future entirely.

Spectrum Depends on a Proper Balance of Licensed and Unlicensed Spectrum.

Congress and the FCC both recognize the importance of licensed and unlicensed spectrum to 5G. The FCC has already scheduled two significant mid-band spectrum

¹¹ Implementation of Section 621(a)(1) of the Cable Communications Policy Act of 1984 as Amended by the Cable Television Consumer Protection and Competition Act of 1992, *Report and Order and Further Notice of Proposed Rulemaking*, 22 FCC Rcd 5101 (2006).

¹² See FCC National Broadband Map, available at: <https://broadbandmap.fcc.gov/#/>

¹³ See Bill Callahan, “AT&T’s Digital Redlining of Cleveland,” National Digital Inclusion Alliance Report (2017). Available at: <https://www.digitalinclusion.org/blog/2017/03/10/atts-digital-redlining-of-cleveland/>

¹⁴ See, e.g., *Commission Inquiry Into the Service Quality, Customer Service, and Billing Practices of Frontier Communications, Report of the Minnesota Department of Commerce*, Docket No. P-407, 405/CI-18-122 (January 4, 2019). Available at: <http://mn.gov/commerce-stat/pdfs/frontier-service-quality-report-final.pdf>

auctions – the CBRS auction and the 2.5 GHz auction. The FCC has also indicated that it will auction 300 MHz of C-Band spectrum. Efforts to open new mid-band spectrum for Wi-Fi 6, notably the 5.9 GHz band and the 6 GHz band, remain delayed.

Lack of sufficient spectrum for unlicensed access remains a significant barrier to the success of 5G. Many of the technologies being developed for 5G, such as internet of things (IoT) networks, require access to Wi-Fi 6. As with all wireless technologies capable of supporting gigabit speeds and many thousands of new devices that will be dependent on 5G, Wi-Fi 6 requires large, contiguous blocks of spectrum. The combination of access in the 5.9 GHz band and the 6 GHz band will create these needed spectrum blocks, allowing users of unlicensed access to leverage the existing deployment in 5.8 GHz for maximum efficiency.

Since the FCC opened numerous licensed bands to unlicensed underlays in the 1980s, we have demonstrated that access to spectrum on an unlicensed basis can easily co-exist with licensed spectrum without causing harmful interference. The improvements in technology over the last 30 years make this coexistence easier than ever. In support of the need to bring certainty to these proceedings after years of engineering study and debate, Public Knowledge attaches a letter from November 5, 2019 signed by Public Knowledge and 34 other wireless equipment manufacturers, tech companies, and public interest organizations urging FCC Chairman Ajit Pai to open the 6 GHz band to unlicensed use on a non-interfering basis with existing licensed users.

CONCLUSION

It is understandable that wireless network providers look to the conversion to 5G as an opportunity to secure advantages over other wireless stakeholders by pushing the

panic button and fostering an impression of crisis. As with the 4G “spectrum crisis,” the danger to U.S. wireless leadership has been greatly exaggerated. Certainly, Congress must take necessary steps to ensure the timely deployment of 5G to all Americans. But these steps should reflect the policy of careful balance that has served us so successfully for the last three decades. By ignoring the hype and fear-mongering, Congress can address the genuine obstacles to 5G deployment without leaving poorer communities in rural or urban America behind.

Thank you, and I am happy to answer any questions at this time.