Questions for the Record from Senator Deb Fischer
To
Mr. Jimmy Carr

Question 1. Mr. Carr, as you may know, in March the Senate passed a bipartisan resolution that I introduced, along with Senators Ayotte, Booker, and Schatz, which stressed the importance of developing a national strategy to encourage the Internet of Things, and this is an issue that we continue to follow closely. We hear frequently about how mobile wireless will enable the growth of the Internet of Things, and I believe that is true, but I also think it is important to keep an expansive view of the technologies that will play a role in this evolution. What do you see as the role of fixed wireless service in growing the Internet of Things?

Answer: Fixed wireless already plays an extremely critical role in the Internet of Things ("IoT"), and will play an even greater role in growing the IoT in the future.

As a threshold matter, Americans who lack access to Internet connectivity cannot benefit from the IoT and related advancements. Thus, extending high-quality, high-data Internet service to rural America is a precondition for extending the benefits of the IoT to rural Americans. Fixed wireless is an extremely cost effective access technology that can be rapidly deployed and should be an important component of a national strategy to bridge the digital divide. This is particularly the case in rural America, where market conditions frequently will not support private investment in wired alternatives. Thus, the first role of fixed wireless in growing the IoT will be providing basic connectivity to communities that are presently unserved or underserved. This is one of the many reasons why it is so critical that the FCC adopt technology-neutral rules that prioritize cost effectiveness for the Connect America Fund ("CAF") Phase II reverse auction. WISPA has recently submitted a proposal to the FCC outlining a technology-neutral framework for the CAF Phase II reverse auction which we believe would foster greater competition and a more efficient allocation of limited public resources.

Fixed wireless will also reduce the cost of IoT applications. This is because the cost per unit of data transmitted over a fixed wireless network typically is substantially lower than the cost per unit of data transmitted over a mobile wireless network. For example, in Loudoun County, Virginia, All Points Broadband's customers can transmit 100GB of data over a fixed wireless network for $79 per month. On the mobile wireless network of a national carrier, the monthly cost of this same amount of data would be $710. While All Points Broadband's unlimited data plans begin at $99 per month, data plans that are truly unlimited are not available from national mobile carriers.

The impact of fixed wireless' relative cost efficiency will continue to grow as end-user data demands continue to increase. For example, America's largest fixed-wireless Internet service provider, Rise Broadband, indicates that its average user presently transmits 94GB of data per month, and that data usage is rising by more than 40% each year.

A large proportion of the "things" that will be connected to the IoT are stationary devices such as smart meters, irrigation controls, and surveillance cameras. For example, many water and sanitation authorities are already using fixed wireless networks to conduct water and flow metering, and real-time video surveillance, telemetry and alarming at remote locations. Fixed wireless enables a large proportion of modern precision agriculture techniques, and fixed wireless networks also support electric utilities' "smart grid" metering programs, railroads' remote monitoring of at-grade crossings, and

operators' monitoring of tank levels and operating temperatures at remote oil wells. Given the relative cost efficiency of fixed wireless networks, fixed wireless will be the preferred access technology for many IoT devices. The reduced cost access made available by fixed wireless networks will spur innovation and benefit the entire IoT ecosystem.

Fixed wireless networks can also provide service where there is no mobile coverage. In many areas of rural America, mobile wireless networks are unavailable or unreliable. Using fixed wireless technology, operators can efficiently expand coverage to specific remote locations where connectivity is required to support IoT applications.

Questions for the Record from Senator Dan Sullivan
To
Mr. Jimmy Carr

Question 1. In your testimony, you discuss the Remote Areas Fund, which is intended for "extremely high-cost areas". Most, if not all, of Alaska would fit this profile. Can you tell me what you would like to see from the FCC regarding rules for the Remote Areas Fund?

Answer: WISPA will urge the FCC to adopt rules for the Remote Areas Fund ("RAF") that are technology neutral. That is, the rules should set minimum requirements for the characteristics of the end-user experience (i.e., speed, latency, data limits and time to complete build-out), and require bidders to compete on cost—awarding support to the bidder offering the most cost effective solution. Rules that encourage bidders to use any combination of access technologies (such as terrestrial fixed wireless, wired fiber-optic technologies, and others) would maximize participation in the competitive process. This competition would ensure that limited public resources are allocated as efficiently as possible, and thus maximize the number of Americans who can be connected with the limited funding that is available.

WISPA has recently submitted a proposal to the FCC outlining a recommended, technology-neutral framework for the CAF Phase II Reverse Auction (the "WISPA CAF II Framework"). The concepts underlying the WISPA CAF II Framework will form the basis of WISPA's approach to the RAF rules.

It is also critical that the RAF rules not preclude bidders proposing to use unlicensed spectrum to deploy wireless networks to provide Internet connectivity. Unlicensed spectrum is a public resource that is already available to connect rural Americans, and wireless Internet service providers have been deploying over unlicensed spectrum to successfully connect millions of rural Americans and businesses for many years. The remote and sparsely populated areas where RAF funding will be available are the same areas where unlicensed spectrum is most available and least congested. RAF rules that preclude or disadvantage wireless Internet access deployments over unlicensed spectrum will increase the cost of connecting rural America in an amount that dramatically exceeds the corresponding public benefit of this additional cost. By increasing the per-connection cost of providing connectivity, such rules would limit the number of Americans who can benefit from the RAF.

WISPA is in ongoing discussions with other industry associations to seek a consensus approach for allocation of the funding, if any, remaining after the CAF competitive bidding process ends. In order to achieve consensus, WISPA's position may evolve.