

**REMARKS OF FCC COMMISSIONER GEOFFREY STARKS
BEFORE MWC19 LOS ANGELES**

Los Angeles, CA

October 23, 2019

Thank you, Tom for that kind introduction. It's great to be at Mobile World Congress 2019 – I've been very impressed. Earlier today I toured the show floor and saw some of the amazing technology that 5G will enable, from virtual reality to massive IoT, from self-driving cars to cutting-edge artificial intelligence. The 5G use-cases being developed are truly ground-breaking, and I am eager to continue to work together on the transformational ways that 5G is still yet being imagined and bring those visions to market.

As you may know I'm the newest FCC Commissioner. I think that's how I got the privilege of being the very last Commissioner to speak! On the one hand, many of my fellow Commissioners have already plowed much of the fertile ground in their speeches the last two days. I have been following, and while there are differences between us, I share many of the same goals they outlined in their remarks: speeding the way for more spectrum to be made available in high, low, and especially mid-bands; right-sizing our siting and infrastructure regulations; and focusing on 5G security on the front end. On the other hand, when you speak last, you do have the benefit of knowing what each of my fellow Commissioners has already said, and I can hopefully offer something fresh. With that in mind, I'd like to offer a bit of my vision on the future of technology.

Great power comes with equal responsibility. Let me tell you what I mean. I firmly believe that technology is one of the most powerful forces for good in our world today. It powers our economy; it drives innovation; and it has, without question, immeasurably improved the lives of Americans everywhere. But there is a dissonance. Technology is moving so fast that our world and, more pointedly, our social fabric, is striving to keep up: deep fakes challenge

whether we can believe the very reality that is presented to us; facial recognition imports with it a risk of dangerous algorithmic bias; 5G can either draw us together through shared new opportunities or divide us further if many of our fellow Americans in the most remote areas are left behind with effectively no Gs at all. These are new challenges, and new muscles will be required.

My take-home message here today is that technology has the opportunity to help drive solutions on issues that matter most in our world. Seize it. Not just for today, but for our shared future tomorrow. To that end, I'm going to talk briefly about climate change; the future of work; and election security. These issues are too critical for us to fail. I also have a few thoughts on your role as corporate leaders and where I'm seeing great work already being done, what is on the horizon, and where we need to go together.

The extreme weather that we've experienced in the last few years here in California and around the world has made it clear that we must plan for the future of our planet as we adjust to the reality of climate change. We're experiencing greenhouse gas levels today that haven't been seen in 3 million years. Technology has a pivotal role to play. Just yesterday I published an Op-Ed with United States Senator Chris Van Hollen on ways that the 5G revolution has the potential to improve the environment. 5G will enable tools that we can use to overcome these new challenges. Most notably, 5G networks will connect billions of devices that will allow us to maximize energy efficiency and minimize environmental impact on a national, local and individual level.

5G will take smart grid technology to the next level, allowing energy companies to smooth out spikes in usage before they happen, respond instantaneously to outages, and route

power in the most efficient manner, reducing consumption and emissions. Smart factories, smart buildings and smart homes will adjust their lighting and heating to reduce energy consumption, while farmers will use data tools and precision agriculture to reduce pesticide usage, water consumption and harmful emissions while significantly increasing crop yields. Autonomous electric vehicles will connect with each other and the transportation infrastructure to plan the most efficient routes to our destinations and reduce emissions by over 80 percent compared to gasoline-powered autonomous vehicles. These are global opportunities ready to be seized.

Cities are on the front lines of the climate change fight as well, and LA is a leader among them. Just yesterday, I met with Los Angeles city officials who explained how LA uses smart city technology to manage street light power consumption, direct traffic to reduce congestion and maximize the efficiency of its recycling and waste management systems. Other cities are adopting similar measures.

Technologies like these could be critical to ensuring that our generation leaves the planet in a better place than where we found it. We all must do our part. During my research, I saw that Verizon has been a leader on these issues. Verizon CEO Hans Vestberg hosted an event in New York City during UN climate week this September and discussed the company's commitment on environmental issues. Soon after, the company and I began a dialogue to see what more can be done, and those discussions resulted in what I am proud to champion is Verizon's newest initiative to make its 5G and related supply chain carbon-neutral by 2025.

Over the next six years, Verizon will challenge its employees, 5G equipment vendors and contractors to cut emissions wherever possible. This effort will impact everything that touches Verizon's 5G network and supply chain, including examples such as converting fleet vehicles from diesel or gasoline to electric power, investing in and using renewable energy resources,

purchasing renewable energy offsets, using more energy-efficient equipment or simply shipping more items by rail rather than truck.

Verizon's plan will require an all-hands-on-deck investment of time and resources across the entire company, and I look forward to working with them to achieve this impressive goal. Great work deserves praise. I applaud Verizon's creativity, initiative and resolve on the issue of climate change. I hope other companies will think deeply about their businesses and how they can similarly develop internal and external practices to help combat climate change. Tech and telecom can lead the way.

The environment is not the only place where 5G technology will shape our future. The fundamental nature of work will change. The Czech writer Karel Capek coined the word "robot" almost a century ago in a 1920 play about factory androids that each do the work of two-and-a-half humans at a fraction of the cost. Smart manufacturing, 5G and automation will enable businesses to achieve greater productivity and increase quality and efficiency in many instances. But that transformation will also disrupt our current workforce. We need to build transition models that will: develop our students' ability to create and drive innovation; support mid-career workers with re-training and up-skilling; and connect workers with new opportunities.

Recent research by McKinsey documents in particular that the automation revolution will disproportionately impact women and communities of color. That is due to their overrepresentation in support roles likely to be automated: truck drivers, machinists, food service workers, and office clerks. To this end, I have started a dialogue with the National Urban League to engage and bring together local community and civic organizations to understand the risks to high rates of job displacement and build a strategy to prepare for the future. In

particular, I note that the top 10 projected regions for African-American net job growth for 2017-2030 all have or will soon have 5G: Houston; Dallas; Atlanta; Orlando; Charlotte; Fort Worth; Raleigh; Miami; Brooklyn and here in Los Angeles. Much like the 5G Fast Plan, we need to develop a 5G Work Plan.

New online tools and digital platforms will play a critical role in suggesting career choices, understanding which jobs are in demand, and achieving the credentials necessary to obtain them. In fact, I recently visited with a leading tech start-up doing just that. Founded by two women of color in Boston, CareAcademy has trained more than 50,000 home health care workers since 2016 through its online-only courses. As our population ages, home health care is a major growth industry, and these jobs are automation-proof. CareAcademy offers its courses in “bite-sized” modules to be consumed on-the-go covering a range of topics, including infection control, nutrition and meal preparation, dementia, fall prevention and safe patient transfers. Moreover, CareAcademy “meets its students where they are,” by offering many of its classes in mobile format so that caregivers can take their courses on their phones whenever they have a free moment. Flexibility is critical, as many of these students – who are disproportionately women of color – often have two or more jobs while also caring for their own families. This training can make a big difference in their lives. With the resulting certifications, CareAcademy’s students can qualify for high-demand positions with better pay and working conditions.

US Cellular has adopted a similar model for the training of its 6,000 sales associates and customer service reps. The company saw that subjecting its employees to 10 to 15-page training materials in team meetings was hard on its employees and generated inconsistent results. US Cellular therefore shifted its training to an online model, converting those lengthy documents into bite-sized, 15-minute online lessons featuring GIFs, videos and flashcards. The company

saw nearly immediate results, with skyrocketing employee completion and pass rates, savings of thousands of hours of meeting time, and valuable feedback for managers about what training was working and what was not. This is work you should be proud of.

On the future of work, I also must mention the work of AT&T, which has one of the largest corporate efforts ever undertaken to re-train and re-skill its workforce. Future Ready is a \$1 billion-dollar web-based, multi-year effort that includes online courses at leading universities, including HBCUs like North Carolina A&T. These programs can be completed in less than two years and allow AT&T employees to obtain degrees in fields that will be critical in the next 10 years, including data science, cybersecurity, and information technology and technology management. We have started a dialogue so that I can better understand their results, what worked, and how to develop best practices for other companies. Tech and telecom can lead the way.

Finally, I must speak about a more-immediate challenge – protecting the security of our election system. A little more than a year from now, Americans will head to the polls to vote for president, Congress and state and local officials. While that may seem far off, we are only a few months removed from the nation's first primaries and caucuses.

The stakes are high, and so is the threat of outside influence. Our intelligence agencies have confirmed that foreign actors sought to tamper with our election systems in 2016 and have predicted that they and other adversary states will seek to do so again. Whether it's spreading false stories to confuse and polarize us, illegally infusing money and other resources into our political process or attempting to tamper with our election systems, hostile forces are engaged in ways to subvert our democracy.

I'm particularly concerned about threats to our electoral process. FBI and DHS documents suggest that Russian-affiliated cyber actors targeted all 50 state election systems during the 2016 voting cycle, including attacks on voting-related websites and voter registration databases. Fortunately, there is no evidence that they were able to manipulate individual votes or aggregate vote totals.

But we can't count on the same outcome this time around. One of the best ways to protect election security is to ensure that our voting machines are disconnected from the internet or "air gapped." A hacker can't tamper with a machine that she can't access. But you may be surprised to learn that some voting machines connect to our wireless networks to transmit their election night results. In fact, the Federal Election Commission estimates that more than 1,000 of these machines remain in use in key states like Wisconsin and Florida.

Once a device is connected to a wireless network, it's subject to the same threats as other wireless communications. Criminals or adversary states can use IMSI catchers or "Stingrays" to mimic cell towers and intercept and alter communications. These same bad actors can use insecure routers in wireless networks to monitor, divert or alter any traffic running through them, including election results. Our adversaries could use any of these connections to change votes, install malware on machines, cause long lines at the polls, or simply undermine confidence in our system.

Because of these risks, I've reached out to the major wireless carriers to discuss how they're protecting their network security. While elections are clearly and primarily the jurisdiction of the state and local governments that administer them. And while election officials at all levels have thought about effectively and efficiently running their elections, many have never thought about the dangers of stingrays or other communications related vulnerabilities.

The FCC has a statutory obligation to protect the national defense – the security of our elections clearly qualifies.

And that's where 5G comes in. Ultimately, election security requires more secure machines and the observation of best practices like paper trails and audits, but we can also take measures on the network side to protect the machines that still connect to our wireless networks. 5G will feature significant security improvements over prior generations of service, including IMSI encryption to foil those Stingrays and network virtualization that will make the network less vulnerable to hacked devices.

We must be vigilant against the coming attacks on our election system, while at the same time doing our best to preserve and expand voting opportunities. For example, here in Los Angeles county they've adopted a program called Voting Solutions for All People to increase voter participation. This program includes ideas like allowing voters to use any one of a thousand regional polling places, permitting citizens to bring coded sample ballots to their polling place, and extending the voting period to 10 days. But Los Angeles isn't just increasing voting access, it's also increasing voting protections through heightened security protocols, systems disconnected from other networks and the internet, and manual ballot audits before certifying any results.

Protecting our democracy is vital and, let me be clear, this is about making sure that every vote, wherever made, is counted accurately. I will use my position as an FCC Commissioner to ensure that we are doing everything we can to secure our elections. The time to protect our elections is now.

Like you, I believe that 5G will change the world. Technology and telecom will continue to lead this tremendous opportunity to impact our world. Industry has done much, but there is much more to do. We shouldn't measure success solely by the number of small cell deployments or record download speeds. In my view, true success in 5G means deploying this technology to the benefit of all Americans. I shared a bit of my vision here today, but come see me on these issues and others where we can work together. Let's get started.