Remarks of FCC Commissioner Michael O'Rielly
Before the Wi-Fi Alliance Annual Member Meeting
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Thank you, Edgar, for that very kind introduction. Many of you were expecting to hear from Chairman Pai, but he was called away on another matter, and, for better or for worse, I was asked to serve as his replacement. As I have said previously on such an occasion, you now get to listen to a shorter, less charismatic, and more somber individual for your meeting's opening act. Lucky you!

In any event, it is a pleasure to join you all this fine morning to discuss the wonder that is Wi-Fi, and specifically, its current state; the obstacles that prevent its expansion in reach and capabilities; and what the FCC can do to improve the situation. Or, if this speech had a counterpart in Clint Eastwood's film archive, it would be, "The Good, the Bad, and the Ugly." For those of you familiar, you knew in taking Chairman Pai's slot, I was going to have at least one movie reference, right?

Wi-Fi's Past & Future

In all seriousness, Wi-Fi is one phenomenal story. Few technologies have experienced similar success in obtaining cooperation among very divergent participants and competitors. Scarcely any have achieved such a steep trajectory of progress, realizing such improvements in speed, latency, distance, propagation, and capacity in such a short time span. Beyond consumers' wide acceptance and adoption of the technology, former adversaries in the licensed community are huge converts, relying on Wi-Fi to offload wireless traffic and reduce congestion on those networks. While some have tried to quantify the individual and societal benefits of Wi-Fi, I am doubtful that it is even possible to truly capture all of its real value. Suffice it to say, the technology has made massive contributions to productivity, functionality, and annual economic output, both domestically and internationally.

Looking back on twenty years of remarkable progress, many of the companies represented by the Wi-Fi Alliance have done the "Good" work and carried out the heavy lifting to bring state of the art short-range wireless connectivity to the entire world. Not to overstate the point, but it's interesting to note that very few technologies have really penetrated the popular lexicon as Wi-Fi. Keep reminding yourselves of the colossal mountains that you climbed and conquered as the technology advanced from one release to the next. You all deserve our sincere thanks for your contributions to mankind, and I, for one, am exceptionally grateful.

For this reason and others, I am excited about the deployment—and branding—of Wi-Fi 6. Admittedly, 802.11ax just doesn't have the same ring to it. Call it what you want but this new effort introduces incredible increases in wireless connectivity speeds to a theoretical 9.6 Gbps, but the enhancements go far, far beyond speed. Indeed, the technology improves the overall consumer experience. I am not telling you anything that you don't already know, but Wi-Fi 6 will help relieve the overloading of existing wireless networks that results when a multitude of devices are trying to connect in the same area. This matters not just for the wireless connectivity of millions of consumer phones and laptops, but the eventual billions of device-to-machine and machine-to-machine interactions that will dominate future individual user experiences, as well as the forthcoming progress we're starting to see in industrials and manufacturing.

Similarly, we must acknowledge the critical role of Wi-Fi in a 5G wireless environment. Building upon the current wireless traffic offloading relationship, these technologies will no longer be viewed as

competitive offerings, but as service complements. It is anticipated that consumers and enterpise users will be able to seamlessly, effortlessly, and perhaps unknowingly migrate back and forth between the two depending upon the circumstances. In other words, unlicensed and licensed will have a synergistic relationship, which will in turn expand the capabilities of both.

Given its past success and future potential, what challenges do Wi-Fi and its advocates face? The "Bad" news is you need access to more spectrum and that's not easy to accomplish. As this audience knows well, industry participants have primarily used slices of two spectrum bands (i.e., 2.4 GHz and 5 GHz) to produce fantastic results. But, given the popularity and pervasiveness of Wi-Fi, these bands are incredibly congested. Moreover, small spectrum channels have certain limitations that cannot be overcome by technological advances. Appropriately, Wi-Fi engineers and innovators have sought much larger swaths of spectrum—channels of 160 megahertz or more—to achieve the vast improvements needed to truly realize and expand Wi-Fi capabilities.

For this to occur, changes in current spectrum allocations are necessary, and this is where the "Ugly" comes in. As you know, the FCC is tasked with balancing the needs of current users with the introduction of new wireless opportunities to achieve the greatest spectrum efficiency. In practice, this involves a protracted, arduous process full of all kinds of unimaginable twists and turns. One advantage the unlicensed community has in navigating the regulatory landscape is that their offerings do not necessarily require clean spectrum.

At the risk of boring this distinguished body, let me turn to one of my favorite topics: the substantive details of spectrum policy. In examining some of the spectrum bands being bandied about and targeted for unlicensed use, I hope to leave you with some optimism: changes in FCC spectrum allocations may be coming to advance your companies' great work and improve the global Wi-Fi experience.

5.9 GHz Band

On point, one of the highest priorities for those looking to expand Wi-Fi service is the 5.9 GHz band. This band was set aside for intelligent transportation services but, contrary to the belief of some, it is not federal government spectrum. The commercial nature of the band undergirds two of Wi-Fi advocates' arguments for why it should be opened to the unlicensed community. First, it is adjacent to the highly-successful 5 GHz band. That means expanding into this adjacent band would be cost-efficient and easy, as equipment can be upgraded without much difficulty. Moreover, these 75 megahertz of spectrum can be combined with the existing 5 GHz band to build at least one wider channel.

Second, I don't think it is unfair to say that the band has been somewhat underutilized. As many of you know, in 1999 the Commission allocated the 5.9 GHz band for Dedicated Short Range Communications, or DSRC. Currently, DSRC has limited deployments, and is mostly used for testing purposes by a few states' Departments of Transportation. The technology has not been integrated into most automobiles, with only three years of operations in one product line that is now scheduled to be discontinued.

It should go without saying that any consideration by the Commission to allow Wi-Fi to use a portion of, or even all of the band, would not constitute a callous effort to jeopardize automobile safety. The Commission's commitment to public safety is second to none, and I have no intention of subjecting Americans to greater risk for automobile injuries and deaths. We would never do that.

Instead, the fundamental issue at hand is whether DSRC will ever materialize sufficiently to warrant exclusive allocation of the entire 5.9 GHz Band—that, after all, it doesn't exactly have the greatest track record. Additionally, the DSRC standard in the Commission's current rules is not the one proponents want to use, but a twenty-year-old, obsolete version. This means that, at a minimum, the rules must be changed in some capacity for DSRC to deploy today, 20 years on. I also think it is fair to recognize that almost all the automobile safety features envisioned under DSRC now exist and operate in other bands. And, the automobile industry's support for DSRC has only waned over time, with car companies repeatedly putting the brakes on their public plans (pun intended).

Even the interest by the 5G Automobile Alliance (5GAA), which seeks to use the band with an LTE-based offering, called C-V2X, is not inconsistent with permitting unlicensed services in the band. This is because doing so has never been a zero-sum proposition. One of Wi-Fi's greatest strengths has been its ability to share the nooks-and-crannies of unused space without causing harmful interference to incumbent users. It is possible to see a portion of the 5.9 GHz band allocated for DSRC, another portion for C-V2X, and another for shared use. Inevitably, some people will claim that the Commission and the Department of Transportation must take further time to complete or at least continue the ongoing 5.9 GHz testing saga. But, in reality, the parameters of the discussion have been altered significantly, effectively making the testing obsolete.

In an effort to explore the gamut of Commission options available to promote efficient spectrum use, Chairman Pai recently announced his intention to issue an extremely broad Notice of Proposed Rulemaking on the 5.9 GHz band. To be clear, this wouldn't be a final rulemaking but simply a process to examine the waterfront of possibilities, from maintaining the status quo, to select reallocation efforts. Based on the extensive comments expected, the Commission could then decide whether and how best to proceed.

This approach may not be universally welcomed. Many in this crowd would probably prefer a more expedited, targeted approach that tentatively concludes that allowing unlicensed services in the band should be permitted. Alternatively, others would like to see reaffirmation of DSRC, introduction of C-V2X, or exclusion of any service that isn't automobile-related. As I see it, the Chairman is trying balance all of the competing interests and create a means to achieve the best possible outcome. That is not irrational decision-making. Since this item would not lead to any immediate impact or harm, it would seem to be advisable to move the NPRM forward.

6 GHz Band

While 5.9 GHz will continue to be a priority, the larger channel sizes enabled by the 6 GHz band are a necessity to truly realize the promise of Wi-Fi 6. Where 5.9 GHz would provide a nice new slice for unlicensed use, 6 GHz provides a whopping 1.2 gigahertz of spectrum. This band provides the best means to get to multiple, very wide channels that the unlicensed community desperately needs. Further, imagine the possibilities of nearly contiguous unlicensed bandwidth that incorporates the 5, 5.9, and 6 GHz bands.

When I started looking at 6 GHz for unlicensed, along with the corresponding C-band downlink at 3.7-4.2 GHz for licensed use, the underlying question was whether we could actually get this to work. There are incumbents throughout 6 GHz, providing fixed satellite, broadcast auxiliary, cable television relay, and wireless fixed point-to-point services. Despite these challenges, the conversation has turned: most are accepting—some begrudgingly—of the fact that next-generation unlicensed wireless technologies will

be introduced in the band. Nonetheless, some details remain to be sorted out. The how—while clearly doable—is a little more complicated, and this is reflected by the diversity of opinions and studies in the docket. The analyses submitted by the Wi-Fi Alliance and others are particularly helpful in demonstrating that enabling unlicensed use, while simultaneously protecting the incumbents, is possible.

As is common in other proceedings, multiple parties dispute the various inputs and assumptions in any given report or study. Entities vehemently argue over whether a proposal is either over- or under-protecting incumbent operations. In this instance, the FCC fully recognizes that incumbents must be protected. At the same time, any such protections must be reasonable. We no longer have the luxury of over-protecting incumbents via technical rules, enormous guard bands, or super-sized protection zones. Every megahertz must be used as efficiently as possible.

Generally, I am very supportive of clearing spectrum ahead of any other option, but, in the context of 6 GHz, that's not realistic, and a spectrum-sharing database makes sense given the scale of current operations. Alas, I have more experience with the pros and cons of such databases than I would like to admit and have spent considerable time and effort trying to accelerate the spectrum access system (SAS) for 3.5 GHz. As that system inches closer to operational, it provides valuable lessons in the development of an automated frequency coordinator, or "AFC." Some worry that the AFC will delay the availability of this valuable and much needed resource. I understand your concerns. The 3.5 GHz SAS has taken longer than anyone would have liked, but thankfully, we know that a 6 GHz AFC would not be as complicated, and that a spectrum sharing database should not significantly delay access to this spectrum. And with a robust, competitive AFC market, any prices associated with creating these entities can be kept to a minimum.

To further realize the potential of 6 GHz, the Commission should pursue the possibility of low-power indoor use, without the AFC, across the entire band. While this may prove to be one of the more contentious issues in this proceeding, I see it as entirely appropriate. Incumbents certainly have some concerns about potentially harmful interference from devices that are not connected to the AFC, especially if the building does not attenuate the signal or if devices make their way outside. However, an AFC will increase costs for those using 6 GHz to operate, for example, their in-home wireless router. And, that's true even if there is competition among AFC providers. Further, having the same indoor technical and access rules throughout the 6 GHz band should expedite the use of the spectrum, facilitate 160-megahertz channel sizes, and accelerate bringing equipment to market. All stakeholders need to be willing to work together to find a flexible and deregulatory indoor approach.

Some have also argued that part of the 6 GHz band should be licensed. While I am certainly willing to listen to those stakeholders, this may be overtaken by events. On the other hand, I certainly agree with some commenters that the Commission should explore the possibility of moving some 6 GHz fixed wireless use to the 7 GHz band, which is used for federal fixed wireless systems. We should actively pursue this idea and examine whether there are additional opportunities for commercial wireless use in the 7 GHz band.

Other Bands – 4.9 GHz and TV White Spaces

While the Commission has lately focused more attention on the bands just discussed, members of the unlicensed community should not take their eyes off the spectrum below 5 GHz. The 4.9 GHz band was allocated 17 years ago and is still greatly underutilized. This public safety band is yet another example of

where command and control spectrum policy has fallen short. No more than three and a half percent of potential public safety licensees are using these frequencies, and they are not being used as the Commission intended. It is time to maximize the use of this spectrum. Yes, it is only 50 megahertz, but it is 50 megahertz in close proximity to the workhorse 5G band. I am sure that the innovative unlicensed community could put this spectrum to good use if given the opportunity.

Finally, let me give a shout out to TV white spaces, a longtime project of mine. In March, the Commission modified its rules to increase database accuracy to better protect incumbents and changed some technical rules to facilitate broadband coverage in rural America. While the proceeding was pending, some other ideas to promote rural deployment were filed in the record and they are now the subject of a petition for rulemaking. These ideas include higher power limits in rural areas, further changes to antenna height restrictions, and technical rule modifications to enable narrowband operations. The Commission should seek comment on these and other submitted ideas as soon as possible. We must maximize the benefits of unlicensed use, especially in the unserved and rural areas of the country, and I hope everyone here today will engage on these matters.

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In closing, you should know that this Commission understands the value of unlicensed spectrum and is mindful of the need to set the stage for its next advances. Making this happen will require the Wi-Fi community to be flexible in its approach, open to reasonable compromises, and patient in seeking its targeted outcome. That shouldn't be all that difficult as that is precisely what Wi-Fi has been doing since its inception.