

2021 TAC WG Proposal

1. 6G WG

- Provide information on the development and deployment of 6G technology, make recommendations and provide technology insights on new developments that need our attention, from the need for more spectrum to the vulnerabilities of supply chain to the changing dynamics of global standards development.
- How does Open RAN/vRAN continue to benefit 6G technology development and the ecosystem?
- What are the efforts to ensure an adequate level of security is provided in Open RAN/vRAN architecture and what are the cost/benefit tradeoffs to consider?
- What are the opportunities for using mmW/terahertz bands for fronthaul/backhaul in support of dense deployment of 6G systems given the capacity capabilities and corresponding bandwidth demands anticipated for 6G systems?
- How is 6G technology envisioned to enhance or be utilized in autonomous driving, edge computing, emergency alerting, and smart city technology deployments?
- How can 6G help bridge the digital divide by bringing down the costs of delivering broadband particularly to rural and urban underserved areas?

2. Artificial Intelligence/Machine Learning WG

- Expand pilot project proposal(s) from the 2020 TAC session to provide details and associated quality metrics that will allow the Commission to explore, extract the value, and gauge the success of implementing AI/ML techniques.
- Explore the use of AI/ML methods and techniques to improve the utilization and administration of spectrum (licensed, unlicensed, and shared) by addressing the fundamental aspects of propagation, interference, signal processing, and protocols.
- Evaluate the use of AI/ML methods and techniques applied to assuring the safety, security, and performance of network equipment, network control, and network operations in a network environment that increasingly relies on automation, is seeing a rapid growth of new network connections, and is increasingly digitized and software-ized.
- Consider the implications of AI/ML adoption by content providers and the impact on consumers, focusing on understanding causes of and approaches to dealing with addictive behaviors.
- Formulate a better understanding of uses of AI/ML that may result in modification of human behavior, to develop sound policies that encourage positive outcomes (e.g., public health measures, and other benefits) and mitigate against negative outcomes.

3. Advanced Spectrum Sharing WG

- Several sharing mechanisms (static/dynamic or centralized/decentralized) have been deployed to enable sharing between Federal and non-Federal users, licensed and

unlicensed users or among licensed users. What are the long-term goals of these approaches? How can AI/ML and sensing-based cognitive radio techniques enhance the effectiveness of the sharing mechanisms and optimize network performance?

- What steps can be taken to better facilitate spectrum repurposing efforts? How can potential intra-band and inter-band issues be identified and addressed early in the process? How can incumbent services be better informed about the nature of adjacent or nearby spectrum environments and how can users be encouraged to take steps needed to accommodate new spectrum uses in those environments? What steps and processes should be used regarding adjacent band spectrum users' wide receiver bandwidths (i.e., the passband extends into adjacent bands)?
- What state of the art filter technologies can be utilized to mitigate potential harmful interference? How can advanced antenna systems help reduce both inter-system and intra-system interference and enhance intra-system performance? What are the cost benefit tradeoffs on utilizing the current filter technologies or advanced antenna systems?
- What are the candidate bands or services that can co-exist with low-power, indoor-only operation such as factory automation? What are the sharing mechanisms to consider?
- What are the sharing mechanisms to consider among various services above 95 GHz, including passive services?

4. Emerging Technologies WG

- Provide information on emerging technologies, including the IoT ecosystem and the spectrum access needs for potential high-bandwidth devices, that are under development or in use that will improve the US consumer experience on applications related to communications. This should include advances in semiconductor technologies for RF front ends, antennas and digital basebands.
- What are the new tools to restore internet access during shutdowns and other disruptions?
- What are the new features or additional chipsets that are expected to be embedded into wireless devices, including UWB and other sensors, and how would they promote additional services and applications?
- What are the network driven emerging technologies such as quantum computing and block chain, and how would they improve user experience in communications services?
- How is indoor/outdoor location service envisioned to improve and what are the technologies that are under consideration?
- What is the status of small satellite development, what frequency bands that are under consideration for use, and what services that are envisioned?
- What are latest enhancements and capabilities of cable and broadcasting standards that may benefit the consumers?
- What optical/laser technologies are being utilized for space or terrestrial communications, what is the performance of these technologies in supporting

communications, and what steps should be taken to ensure proper use of these technologies?