



**Wireless Innovation Forum's Comments to
the FCC regarding Licensing Models and
Technical Requirements in the 3550-3650
Band**

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Before the
Federal Communications Commission
Washington, D.C. 20554

In the matter of)	
)	
Commission Seeks)	
Comment on Licensing)	GN Docket No. 12-354
Models and Technical)	
Requirements in the 3550-)	
3650 Band)	

**COMMENTS OF THE WIRELESS INNOVATION FORUM ON THE FEDERAL
COMMUNICATIONS COMMISSION PUBLIC NOTICE SEEKING COMMENT ON
LICENSING MODELS AND TECHNICAL REQUIREMENTS IN THE 3550-3650 BAND**

The Wireless Innovation Forum (Forum) is a US based international non-profit organization driving technology innovation in commercial, civil, and defense communications around the world. Forum members bring a broad base of experience in Software Defined Radio (SDR), Cognitive Radio (CR) and Dynamic Spectrum Access (DSA) technologies in diverse markets and at all levels of the wireless value chain to address emerging wireless communications requirements through enhanced value, reduced total life cost of ownership, and accelerated deployment of standardized families of products, technologies, and services.

In this response, the Forum offers comments on the technical considerations brought forward by the Commission. In previous responses to similar topics, the Forum has expressed its support for spectrum sharing and the use of small cell technology in the 3.5 GHz band¹ and the

¹ Wireless Innovation Forum's Comments to the FCC regarding the Notice of Proposed Rulemaking and Order on Enabling Innovative Small Cell use in the 3.5 GHz band Adopted December 12, 2012, WINNF-13-R-0002, <http://groups.winnforum.org/d/do/6495>

value of utilizing multi-stakeholder groups². To add to this discussion, we would like to elaborate on the foundational elements of multi-stakeholder groups, as well as the opportunity to define not only the operating rules for the 3550-3650 band, but significant future shared spectrum bands.

The charter of the FCC to operate on behalf of the citizens of the United States has undergone significant changes through the years. These changes represent direct and appropriate response to major shifts in public, private and government need for wireless communication. In simple terms, under “The Communications Act of 1934 the FCC is charged with allocating spectrum space to maximize the public interest, convenience, or necessity. The Communications Act and its revisions mandate promotion of the public interest, and thus the encouragement of a diversity of voices so as to promote a vibrant democracy.”³ Initial regulatory and policy efforts focused on technology issues related to specific needs for conventional communication. Use cases were isolated in specific spectral bands. As technology advanced and services originated markets (voice, video, multimedia) emerged, the “Telecommunications Act of 1996”⁴ modified the charter of the FCC to de-emphasize legacy technology and reduce regulation in favour of rapid adaptation of newer technologies that supported public services such as digital broadcast systems and cellular based communications. In proposed amendments to the FCC charter in the “Federal Communications Commission Consolidated Reporting Act of 2013”⁵, will “require the FCC to determine whether laws and regulations pose a barrier to entry into communication markets and to include that information in the in the biennial report” submitted for review.

² Wireless Innovation Forum’s Comments to the FCC regarding the Public Notice on the Technological Advisory Council (TAC) White Paper and Recommendations for Improving Receiver Performance, WINNF-13-R-0006, <http://groups.winnforum.org/d/do/6831>

³ http://en.wikipedia.org/wiki/Communications_Act_of_1934

⁴ http://en.wikipedia.org/wiki/Telecommunications_Act_of_1996

⁵ http://en.wikipedia.org/wiki/Federal_Communications_Commission_Consolidated_Reporting_Act_of_2013

Rapid advancement and deployment of Software Defined Radio (SDR), Cognitive Radio (CR), Self-Optimizing Networks (SON), Dynamic Spectrum Access (DSA), advanced Physical Access layer (PHY), Media Access Layer (MAC) and Protocol stack technologies are but a few of the innovations that support important services and use cases that benefit from shared spectrum for both primary and secondary users of public and government services. Major advances in component technology and processor based algorithmic analysis now support real-time control of spectrum.

In 1996 the FCC recognized the need to soften regulations based on specific technologies used in legacy systems in favour of regulations based on user services, independent of implementation. The result was to enable rapid advancement and adoption of digital communications which greatly increased spectral efficiency of both broadband and narrowband communication systems. In 2013 it is equally important for the FCC to recognize the need to exercise a light regulatory touch in supporting innovations related to spectral sharing and frequency agile communications, which will define the next revolution in spectral efficiency.

The Forum enthusiastically supports the FCC efforts in defining Harm Claim Thresholds as a tool to determine appropriate relationships between primary and secondary users, and increased multiuse spectrum available for both narrowband and wideband systems. The Forum also supports regulatory and policy development based on services rather than technology to continue fostering innovation in all areas of science and technology used in communication systems.

Below is the Forum's response to the specific issues contained in Section 2, Paragraph 50, included below for clarity:

2 Additional Technical Considerations

WE NOTE THAT THE FCC'S TECHNOLOGICAL ADVISORY COUNCIL (TAC) HAS BEEN STUDYING SPECTRUM INTERFERENCE POLICY AND RECEIVER STANDARDS IN GENERAL, AND IT RECOMMENDS THAT THE COMMISSION CONSIDER FORMING ONE OR MORE MULTI-STAKEHOLDER GROUPS TO STUDY SUCH STANDARDS AND INTERFERENCE LIMITS POLICY AT SUITABLE SERVICE BOUNDARIES, SUCH AS THOSE RELATED TO THE 3.5 GHZ BAND. SHOULD THE COMMISSION ENCOURAGE THE FORMATION OF ONE OR MORE GROUPS TO INVESTIGATE INTERFERENCE LIMIT POLICY FOR THE 3.5 GHZ BAND? IF SO, WHAT SHOULD BE THE SCOPE OF SUCH A GROUP OR GROUPS?

There a number of approaches that the civil sector could adopt to ensure non-interference to Federal operations, and a number of venues to develop these methodologies and criteria. The process to select and appoint a single organization with sole authority to develop these, and to establish a single interference avoidance methodology could be quite lengthy, and would have the effect of having the Government make implicit or explicit decisions regarding market uses, technology, and standards that modern spectrum management policy has explicitly avoided making. Such a process would be inherently not technology neutral.

We encourage the FCC to be as involved in the process of establishing the CBS Federal interference protection criteria as is possible within their resource constraints and mission scope. However we also recognize that much of this expertise is present in the private sector, and that the process that implements this very exciting initiative should be maximally accessible to the widest community.

We believe the eventual R&O should provide, as a minimum, a process for multi-stakeholder, industry formed groups to propose spectrum sharing standards and criteria to the Government, and that the Government be obligated to act on them in good faith within a stated,

and limited time period, consistent with the principles of the Presidential Memorandum of June 14, 2013.

Such a process would entail:

1. Accepting and evaluating specific spectrum sharing criteria and engineering standards
2. Performing evaluations consistent with the transparency and spectrum sharing principles established by the Presidential Memorandum of June 14, 2013
3. Provide support to multi-stakeholder groups and other industry organizations in understanding the sharing constraints of incumbent Federal systems, in accordance with the principles of the Presidential Memorandum of June 14, 2013
4. Establishing a fixed timetable for these evaluations
5. Ensure that these evaluations are transparent (to the maximum extent possible consistent with National Security) and any adverse options are consistent with the principles of the Presidential Memorandum of June 14, 2013
6. Permit proposals beyond the initial spectrum opportunities provided in the eventual CBS R&O so that spectrum sharing can be established more broadly, consistent with the principles of the CBS R&O

With these principles in place, the Wireless Innovation Forum can commit to establishing such a multi-stakeholder process to develop these recommendations.

The Forum recommends the FCC encourage formation of industry lead multi-stakeholder groups to address specific interference and interference mitigation issues, such as the CBS bands, which is the subject of this Public Notice. The Forum believes the FCC will best be served by executing on the framework above to enable stakeholders to work together to form tightly

focused working groups to evaluate all current and emerging technical issues that are relevant to spectrum sharing for specific use cases and frequency bands of interest. By enabling multi-stakeholder groups to participate in the process, the FCC can capture a diversity of opinions gathered and provided from different perspectives on technology, services and business models. This ensures recommendations from these multi-stakeholder groups will be responsive to the FCC rule making process for complex multiuse spectrum issues.

The Forum is an example of a broadly focused multi stakeholder group with characteristics listed below:

- Open and transparent:
 - Membership open to all industry, government and academic institutions
 - Published research
- Membership supported:
 - Operations independent of specific industry or government funding
- Technology independent:
 - Support for a broad range of science and technology programs and projects
- Strong relationships with other multi stakeholder groups
 - History of corporative development with a broad range of government, industry and academic multi-stakeholder groups
- Strong support for multiuse spectrum
 - Central focus of the Forum Advocacy Agenda is open use of spectrum for benefit for all users.
- User focused:
 - Projects supporting innovation for improving wireless communications for users
- Experienced in military, tactical, public safety and commercial communications.
 - Understanding of communication systems ranging from military to commercial deployments
- International Membership:
 - Ability to support development of both United States and international standards

The Forum recognizes the challenges, both technical and policy based in enabling multiuse spectrum and is dedicated to finding innovative solutions for frequency agile communication use by primary and secondary users. The Forum believes it is well positioned to form and manage multi stakeholder groups for evaluation and recommendations for the CBS bands as well as others other bands. Forum member companies have a broad range of experience from HF communications through V-Band. Although different bands will likely include support from a range of additional multi stakeholder groups, it is important the FCC clearly encourage broadly focused multi stakeholder groups through the process outlined above to do the heavy lifting coordinating the efforts of interference analysis and policy recommendations for consideration by the FCC. This will encourage industry, government and academic institutions to invest their best resources in this effort and also insure broad support for rapid adoption of multiuse spectrum.

While the members of the Forum understand the need to focus discussions on the requirements for the specific band of interest, and support the approach defined by the FCC in the public notice, the Forum cautions the Commission against over specifying band specific solutions. The members of the Forum believe that the use of a common architectural model should be encouraged across bands where practical, allowing the standardization of interfaces where appropriate and the reuse of technologies developed for the SAS, etc. to the greatest extent possible. By maintaining architectural integrity across bands where possible, the Forum believes that the commission will better enable economies of scale to be achieved in the deployment within the 3.5 GHz CBS band, improving the business case for investment in spectrum sharing solutions and subsequently fostering competition through the creation of an ecosystem of vendors with interoperable technologies supporting the defined architecture.

Respectfully submitted,

Keith Nolan
Chief Regulatory Officer
Wireless Innovation Forum

Dated: 5 December 2013