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**Statement of M2Z Networks, Inc.
Regarding
Commerce Spectrum Management Advisory Committee
Interference and Dynamic Spectrum Access Subcommittee
Interim Report
July 27, 2010
Boulder, CO**

We have reviewed the draft report and would like to bring several issues listed below to the attention of CSMAC and the general public interested in these proceedings. We hereby request that our statement be reflected in the public record of the proceedings and referenced where applicable.

1. **Definition of Harmful Interference Lacking:** The draft fails to address the foundational issue of what constitutes “harmful interference” or even whether the current ITU/FCC/NTIA definition is practical and/or adequate.

The FCC has stated in the Wireless Innovation NOI that ambiguities in determining harmful interference often delays wireless innovation. Where does CSMAC stand on this issue?

2. **Avoiding An Absolute Preference of Incumbents Over New Entrants:** In general, the draft report fails to properly balance the rights of incumbents with the benefits of introducing new and innovative services that are important to consumers and are in the national priority. The draft report appears to suggest that such balancing is unnecessary and the incumbents’ rights are always absolute.

Although we agree that investment in wireless services requires a predictable regulatory environment, we do not believe that incumbents deserve an absolute right to occupy spectrum or to do so inefficiently. The rule proposed by the CSMAC draft report puts an absolute obligation for protection of incumbent services on new services and will therefore deter future investments in wireless services and stifle innovation. To address this issue, we recommend that CSMAC recommend a periodic review of incumbent bands to establish whether more efficient technologies and practices could be deployed and the costs associated with implementing technologies in order to create more efficient use of the incumbents’ spectrum. We recommend that CSMAC look into the available legal, policy and equitable constructs for determining which party should bear the cost of new services being introduced. We recommend that these issues are case specific and need to be decided on a case by case basis. We also believe that any such decision should be done using the general principle for determining liability

- between equally situated parties which is that the costs should be borne by the party best able to bear the cost. We believe that the FCC already supports such a proper balancing and we cite to the May 20, 2010 FCC WCS/SDARS decision where the Commission carefully balanced incumbent issues with the benefits of new service.
3. **Interference Effects Should Be Measured by Using Advanced Techniques such as Probabilistic Modeling:** The report fails to mention or analyze the ongoing controversy in the US on when it is appropriate to use probabilistic models of interference that take into account changing geometries and their likelihood and when it is appropriate to use the more traditional worst case minimum coupling loss (MCL) model. While incumbents may always prefer the MCL model because it maximizes their protection, probabilistic models are increasingly used in CEPT and ITU-R. Some thoughts on when each type of model is appropriate would be very useful. We point to recent FCC analysis in the May 2010 WCS Order and the October 2008 AWS-3 Interference Report (and companion public filings) as reference points for the CSMAC to fully consider before deciding on a single methodology for quantitatively assessing interference.
 4. **Guard bands and Creating Incentives for Improved Filters:** The CSMAC needs to recognize that even though physical guard bands are effective solutions under certain circumstances, they still represent an inefficient use of spectrum. Quantitative guard band requirements are intrinsically a function of both transmitter and receiver filter performance - except in the case of co-channel systems. Like the semiconductor performance modeled in Moore's Law, filter performance is a function of technology and improves with time. While the report suggests government funding of filter R&D, a better approach might be a closer dialog between US spectrum managers and filter manufacturers to avoid "chicken and egg" problems with improved filter technologies. Manufacturers only want to mass produce filters that are needed to implement system standards, better filters are in more limited custom production. Spectrum managers want to require readily *achievable* performance – usually what is already in mass production. Thus incentivizing licensees and filter manufacturers through a readiness to adopt tighter filter requirements over time will help bring improved performance to market faster and allow better spectrum efficiency.
 5. **Rapid Introduction of Spectrum Efficient Technologies:** Many types of wireless systems now have component service times of a few years even though the system will operate for decades. Any guard-band decision should thus consider the possible gradual improvement of incumbent filter performance with new technology. This is the approach under consideration in the PCS H block deliberations where limited receiver performance of today's PCS units limit full use of the H block, but improved receiver performance would allow full use.
 6. **Cognitive Radios Could Improve Efficient Use of Spectrum:** While cognitive radio is generally thought of in the context of picking idle frequencies for use, some idle frequencies will result in interference in receivers that are close in frequency and distance through the various mechanisms discussed in the draft and others will not..

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Preston Marshall, formerly of DARPA, has repeatedly pointed out in the past few years that cognitive techniques can also be used by new systems to pick frequencies to protect nearby incumbent receivers that have limited performance. Yet the report never even mentions the use of cognitive radio as an alternative to guard-bands or as a tool to limit guard-band needs.