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

In the Matter of	)	
	)	
Revision of Part 15 of the Commission's	)	
Rules to Permit Unlicensed National	)	ET Docket No. 13-49
Information Infrastructure (U-NII) Devices	)	
in the 5 GHz Band		

COMMENTS OF SPECTRUM BRIDGE, INC.

Executive Summary

Spectrum Bridge, Inc. ("Spectrum Bridge") strongly supports the Commission's goal to increase the availability of spectrum in the 5 GHz band. Promoting innovation in this band will result in significantly more wireless capacity and ensure competitive and compelling wireless service offerings remain available to the American Public. In these comments, Spectrum Bridge addresses many of the relevant issues. We do so from experience acquired through many years of providing a secondary marketplace for spectrum, spectrum sharing databases (5 GHz TDWR and VHF/UHF TV White Space), and spectrum management and planning services to the wireless industry.

Specifically, we propose a modification of the concept of a geo-location database to focus on automated, centralized policy management. We propose that all radios that operate in the revised 5 GHz band be required to query a policy database on a regular interval. Note that Policy is different from frequency assignment. Policy includes the ability to affect operational parameters such as

maximum transmit power and spectral mask information. The use of a Policy database creates an efficient, manageable, extensible, and future proof solution for managing various operational scenarios that exist in the band today and that may exist in the future. The Policy database should be used in conjunction with complementary technologies such as dynamic frequency selection, sensing and geo-location databases, which would also be implemented as part of the Policy.

/s/ Peter Stanforth May 24, 2013

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Managing Policy via a Database.

Many of the issues cited to support the notion that spectrum should not be shared stem from the fact that when policy is hard coded in a deployed radio device, it is difficult, or nearly impossible, to modify it. This is no longer a barrier, as technology has enabled the ability to implement cloud based policy management. We propose that behavior policies no longer be hard coded into radio devices, but should be managed via a centralized database or policy engine. Policies should be verified and updated, as required, and radio devices should only be certified when they can demonstrate that they can be controlled and updated by a policy manager.

Policy can be adjusted and adapted over time to accommodate changes in the environment, the effectiveness of existing policies, adaptation to new requirements or other reasons that impact the balance of availability of spectrum for sharing. For example, a device shipped today that is capable of using Dynamic Frequency Selection [DFS] to avoid Terminal Doppler Weather Radar [TDWR] could be updated with a new policy to detect a new type of TDWR waveform. Similarly, if a device relies upon a geo-location database, the policy manager can update a database with new information about changing TWDR locations, and subsequently affect the spectrum available to radio devices in affected locations.

Centralized policy management also enables the ability to apply policies on a non-uniform basis. We have clearly seen the context of geography and time applied with respect to policy in TVWS, where channel availability is dependent on time and the location of the device. However, we can now introduce additional contextual parameters such as “Trust” and “Capability” of a device.

For instance, if a device can only provide basic information, such as FCC-ID and location, it will be subject to a very restrictive policy resulting in less spectrum available for use. However, a device that can provide more specific information, such as an antenna pattern and higher confidence in its location, may receive a more permissive policy, resulting in more spectrum available for use. Over time this will incent manufacturers to make their devices more flexible and more intelligent, but does not preclude a business model that requires a simple and inexpensive device.

We also believe that adoption of a flexible policy mechanism incentivizes the requirement to harmonize the band. It provides a mechanism to perform harmonization over an extended period and permits existing solutions to be grandfathered for use, albeit with more restrictive policy.

Devices that can only operate as low power clients should not require access to a policy database or use other techniques to determine interference, as they will be "tethered" to an AP.

All Access Points, regardless of transmit power level should obtain permission to operate from a spectrum policy database. Using a ratio that roughly 1 in 10 devices will function as an AP, the "tax" or "burden" requiring all APs to communicate with a database will be negligible when the number of enabled devices is considered. The actual cost of database access will be very low and likely be built into the cost of the AP. This eliminates the issue of moving "indoor" Access Points "outdoors" or other device movement scenarios. If an Access Point loses its

connection to a database it could also operate with a limited default policy – it need not be a brick.

Finally, the use of the SAS/database concept can be extended to accommodate other interference avoidance techniques. For instance unique situational policies such as "a device must use DFS to access spectrum at this location", or "a device can only use spectrum at this location if permission is acquired from a geo-location database every xx minutes" can be accommodated.

FCC seeks comment on the viability of a SAS like solution

TVWS has proven the viability of SAS management solutions. Because 5 GHz spectrum is destined for unlicensed use, a similar model will work in the 5 GHz band. Industry is satisfied with a TVWS model that it is competitive and cost effective and that adequately protects incumbents and ensures that the policy compliance exceeds the requirements defined by the FCC. The extensions discussed in the NPRM are relatively trivial to implement and support.

TVWS has already demonstrated that the wireless industry is willing to provide comprehensive policy and geo-location database services. Today there are two certified databases with more in development and certification. In all cases, the database operators have defined a business model that provides incumbent protection at no cost to the incumbent and with competition, the services offered to the secondary users will be cost effective and affordable.

FCC seeks comment on the cost, requirement and the definition of "professional installation"

Professional installation is cost effective and can be managed to ensure the integrity of radio installations and the installers. This can be accomplished through certification and authenticated through secure electronic processes that exist today. In other words the validation of the professional installed can be an automated function of the SAS solution.

Spectrum Sensing Technologies

Spectrum Bridge has maintained that sensing technology is a critical and complimentary component of successful spectrum sharing, particularly when integrated with a policy manager/geo-location database. We encourage the FCC to continue to define policy that permits and encourages sensing as a tool to be applied in spectrum sharing and management. As a minimum, sensing can be used to compare the environment 'predicted' by a geo-location database, and subsequently be used to refine the 'predictions' of the geo-location database through feedback. Eventually sensing could even be used as a mechanism to refine policies. For example, if sensing can validate that an AP is in a basement rather than on a roof, its operating characteristics should be different. Much like DFS, a policy manager can prescribe the sensing that must be undertaken by a device or what data should be reported back to the database.