

VPNet, Inc.
Statement in Support of Experimental License Application

VPNet, Inc. (“VPNet”), pursuant to Section 5.63(c)(1) of the Commission’s Rules, provides this statement in support of its application for renewal of its experimental license (Call Sign WJ2XQC) covering a technology and market trial, as defined in Sections 5.5 and 5.602, using spectrum in the 3550-3650 MHz band currently transmitting from six locations in rural Puerto Rico to a limited number of end users. VPNet requests a renewed license term of one (1) year. VPNet intends to seek separately modest modifications to its current authority to extend coverage to certain portions of its service area with more rugged topography in order to provide more data with respect to installations that do not afford direct line-of-sight coverage.

VPNet acknowledges that its existing experimental license under Call Sign WJ2XQC contains a special condition (Condition 8 to the license), which provides that “the market trial will not be renewed.” It is the applicant’s understanding that this condition was imposed on a number of experimental licenses covering the 3550 to 3700 MHz band as a means of preventing “temporary” market trials from extending for too long a period of time and becoming *de facto* service offerings, as well as to ensure that operations in the band would transition in a timely manner from experimental to regular operation under the FCC’s Citizens Broadband Radio Service (“CBRS”) rules.

In practice, however, this limitation was applied inconsistently, with some applicants being granted up to two years to conduct such trials and expiration dates extending into 2020. *See, e.g.*, Windfield Enterprises LLC dba Kellin Communications, Call Sign WJ2XFB, File No. 0723-EX-CN-2017 (granted March 2, 2018); MetaLINK Technologies, Inc., Call Sign WJ2XHI, File No. 0046-EX-CN-2018 (granted Feb. 22, 2018). In other cases, no such condition was imposed at all on licensees conducting experiments under the “limited market trial” subsection (47 C.F.R. 5.3(j)) of the rules. *See, e.g.*, Union Telephone Company, Call Sign WJ2XTE, File No. 0747-EX-CN-2018 (2-year grant issued Oct. 16, 2018); AT&T Labs, Call Sign WI2XWI, File No. 0127-EX-CM-2018 & 0330-EX-CR-2019 (1-year grant issued July 19, 2018; 3-year renewal issued July 1, 2019). Finally, licensees that were initially granted one-year licenses that were expressly subject to the non-renewal condition have since been granted a one-year renewal in order to continue their assessment of CBRS technology using customer premises equipment, some until the latter half of 2020. *See, e.g.*, Vivint Wireless, Inc., Call Sign WJ2XKV, File No. 0046-EX-CR-2019 (1-year renewal grant issued Feb. 7, 2019); Newmax LLC dba Intermax Networks, Call Sign WJ2XOE, File No. 0408-EX-CR-2019 (1-year renewal grant issued Aug. 7, 2019). Such a waiver of the condition prohibiting renewal is entirely appropriate given both the initial delays in the general availability of CBRS equipment for testing and the longer than expected timeframe for implementation of CBRS rules and the certification of the required Spectrum Access

System.¹ Accordingly, VPNet requests the same treatment be afforded to this renewal request.

Renewal is especially appropriate in this instance due to the unique communications service challenges facing Puerto Rico, including economic and infrastructure conditions that were exacerbated by the devastation caused by Hurricanes Irma and Maria two years ago. The areas that will continue to receive experimental service during the requested renewal period are particularly remote and economically-deprived areas that sustained substantial damage to communications capability and have received little or no reconstruction investment from wireline carriers to date. Planned modifications to the experimental program that will be the subject of a separate modification application would permit new testing at sites with unusual topography where the viability of non-line-of-sight service can be evaluated.

Overview

VPNet is a privately-owned provider of fixed wireless broadband services in rural areas of Puerto Rico. It provides a variety of Information Technology and Telecommunication related services, with an emphasis on providing primary and redundant services to commercial and residential clients located in rural areas throughout the island.

On August 27, 2018 the FCC granted VPNet experimental license authority under call sign WJ2XQC. VPNet intends to continue its experiment with upgraded access point and customer premise equipment (“CPE”) to better explore and confirm its initial findings of how software-defined, LTE-based equipment manufactured by Telrad Networks can be a successful deployment option, and to demonstrate that mid-band spectrum may offer consumers the best combination of throughput, propagation, cost and performance in areas where access to competitive broadband services is lacking. The current trial has been used in conjunction with VPNet’s continuing efforts to restore and improve fixed broadband service in Puerto Rico. To date VPNet has gained a better “real world” understanding of the benefits, challenges and costs associated with deployment of the equipment and how it functions with the SAS and Dynamic Protection Area (“DPA”) software. Understanding the trade-offs between cost and performance has and will continue to significantly inform VPNet’s business decisions, for the benefit of its own financial modeling and consumers who would be offered better service. Some of VPNet’s service areas are still without primary internet service due to the rural environment in which they are located. Non-line-of-sight service provides a significant opportunity for service in these areas.

¹ VPNet is also willing to accept an appropriate condition to a renewal grant requiring notification to and coordination with the Arecibo Observatory Spectrum Manager to protect 3.5 GHz operations at that facility.

Last year, the Commission granted a blanket waiver of certain Part 96 rules to enable more rapid access to CBRS spectrum.² As a part of its ongoing trial, VPNet has used an alternative protection method based on DPAs to permit Federated Wireless' DPA-enabled SAS to authorize Category B CBSDs in Puerto Rico. Because the entirety of Puerto Rico is within an exclusion zone to protect Naval radar operations, a DPA-enabled SAS is the only way where, in the short term and perhaps longer, CBRS facilities have been deployed in Puerto Rico, an area where other spectrum resources are being congested as temporary wireless facilities are deployed and in some cases have replaced wireline plant damaged in the 2017 hurricanes. A significant part of the trial is to determine the level of use that Federated Wireless' DPA-enabled SAS will allow for commercial use.

The market trial aspect of this proposal involves up to 200 of VPNet's customers, which is about 15 percent of its customer base. Under the renewal term, VPNet will continue to experiment with various speed and pricing plans to assess consumer acceptance of the service. If the trial continues to prove to be technologically successful and beneficial to consumers, VPNet will be able to determine whether the equipment can be efficiently and economically deployed with high quality performance under the control of the SAS and whether the band is suitable for large-scale restoration of broadband service such as that which was uprooted by Hurricanes Irma and Maria. The trial has been designed to involve the minimum number of customers and towers to provide VPNet with the information it needs regarding customer demand and preferences and to determine the capabilities of the DPA-enabled SAS.

Overall, this limited trial will provide VPNet with information to help make its future equipment, expansion and network investment plans. Assuming the trial is ultimately successful and CBRS Category B devices are permitted in Puerto Rico, , VPNet expects to utilize a combination of Priority Access Licenses ("PALs") and GAA "license by rule" spectrum in the entire 150 megahertz of 3550-3700 MHz spectrum.

In order to determine the financial and technical viability of the CBRS band and assess consumer acceptance at various speeds and price points, VPNet seeks to renew its experimental license to use spectrum in the 3550-3650 MHz band, transmitting from the six current locations identified in its license. VPNet hopes soon to expand the trial to additional locations that should yield additional helpful data with respect to non-line-of-sight operation in areas with unusual topography. In sum, this experiment will inform VPNet's business, investment, technology and deployment decisions as it plans to restore, expand and upgrade its fixed broadband network.

² See *Promoting Investment in the 3550-3700 MHz Band*, DA 18-538, GN Docket No. 17-258 (rel. May 22, 2018) ("Waiver Order")/

Description of Trial

VPNet plans to continue its trial of Telrad transmission equipment. VPNet also plans to use Federated Wireless' DPA-enabled SAS to ensure that Navy vessels do not experience harmful interference. Power limits and out-of-band emission limits will conform to the Part 96 rules for Category B CBSDs that the Commission adopted in the *CBRS Order* and the Order on Reconsideration and Second Report and Order.³

VPNet will conduct the experiment in its existing area of operations in Puerto Rico. VPNet has access to and is transmitting from existing towers and operation in this area with personnel on site to monitor deployment and operation, which will ensure that there will be no harmful interference to Incumbent Access users, and to remedy harmful interference in the unlikely event it occurs. Commission records show that there are no Fixed Satellite earth stations in the 3600-3650 MHz band operating near the test area.⁴ Likewise, there appear to be no ground-based radar facilities in or near the planned trial area that would require ESC or coordination with incumbents.⁵

Under the market trial aspect of the experiment, VPNet plans to test different broadband speeds and price points to about 15 percent of its subscriber base in order to determine the utility and value of the CBRS as it relates to consumer take rates, preferences and network performance. Consistent with the market trial requirements of Section 5.602(d), VPNet will own the access points and any CPE owned by customers will be re-tuned to operate only in the 3650-3700 MHz portion of the band at the conclusion of the trial, unless the equipment can be used to operate in compliance with Part 96 rules at that time.

As stated above, the trial involves about 15 percent of VPNet' customer base, which it believes is the minimum quantity necessary to conduct the trial proposed in this application. There are a number of reasons why the trial has been designed in this manner. First, each tower has different topography and line-of-sight features, and VPNet as VPNet continues to determine the best ratio of coverage and throughput in these disparate environments. Second, VPNet is conducting its trial with different numbers of customers at each location so it can compare performance and evaluate usage trends and congestion points, which are significant factors in network deployment and management that inform equipment purchasing decisions. Third, VPNet has received anticipated feedback from trial participants at each of the diverse locations. This feedback has, and will continue to, inform VPNet on its decisions whether to deploy in

³ See *Amendment of the Commission's Rules with Regard to the 3550-3650 MHz Band*, Order on Reconsideration and Second Report and Order, 31 FCC Rcd 5011 (2016).

⁴ See *Amendment of the Commission's Rules with Regard to the 3550-3650 MHz Band*, Notice of Proposed Rulemaking and Order, 27 FCC Rcd 15594 (2012), at Appendix A.

⁵ See Letter dated from Paige R. Atkins, NTIA, to Julius P. Knapp, FCC, GN Docket No. 12-354 (dated March 24, 2015), at Enclosures 1 and 2.

CBRS and, if so, what equipment it should deploy, where the equipment should be deployed, and the services it should offer. Fourth, the trial is needed to test the viability of the Federated Wireless DPA-enabled SAS which, if successful, may pave the way for more wide-scale deployment in areas where Navy vessels are protected. Finally, continuation of the trial will help VPNet determine whether and to what extent the 3550-3700 MHz band can be used to restore service to locations like rural areas of Puerto Rico ravaged by Hurricanes Irma and Maria.

Objectives of Experimental Program

During the trial, and prior to the full certification of a SAS and ESC, VPNet will comply with the power levels in Section 96.41 as they apply to Category B CBSDs and End User Devices. At the conclusion of the experimental license term, VPNet will either transition to Part 96 GAA if equipment is certified and authorized under GAA rules or, if not, cease operation in 3550-3650 MHz.

In addition to the technical objectives, VPNet will test to determine the value and utility of PALs, which necessitates charging for the service at varying price points and performance levels. The trial will also provide VPNet with information that will be useful in valuing and bidding on PALs.

The experiment will examine the impact of the following rules on potential future commercial deployments.

Section 96.15 - Validate ability to comply through dynamic frequency changes across a geographically clustered collection of CBSDs, planned and executed within 300 seconds of a simulated command to vacate an occupied channel.

Section 96.17 – Validate propagation model’s ability to predict co-channel interference, blocking, and OOBE to comply with protections of existing Incumbent Access users. This will also be useful to assess protection of PAL users by GAA users.

Section 96.25 – Validate propagation model’s ability to predict compliance with PAL Protection Areas.

Section 96.41 – Determine the appropriate power levels to both comply with this section and achieve desired coverage and performance. The aggregate RMS power level RSS and PAPR requires measurement validations in a real-world environment where CBSD and End User Device density is consistent with intended long-term use of the band. Propagation models must be tuned and validated to accurately predict compliance. Power level control of the equipment must be tuned so that the CBSD and End User Device transmit at the lowest power levels possible to meet performance objectives, while complying with the prescribed limits.

Section 96.53 – Develop methods to detect interference at the CBSD and End User Device from other GAA and PAL users so it can be reported to the SAS and ESC.

Contribution to the Radio Art

In accordance with Section 5.63(c)(1), VPNet expects that the trial will contribute to the radio art. The CBRS is a new service in which commercial and Federal uses will share a spectrum band, with use governed by an SAS and ESC. It has been characterized as a test-bed for innovation and as a paradigm shift in spectrum management. In connection with its market trial, VPNet expects to learn a significant amount of information about equipment capabilities and limitations, interference protection and mitigation, customer acceptance at various speeds and price points, and integration of its service and equipment with the SAS and ESC. Because VPNet will make test data available to Telrad and Federated Wireless, the manufacturer also will gain important information that can be used to improve equipment performance and development.

Notice to Trial Participants

As required by Section 5.602(e), all end user customers participating in the trial will be advised at the commencement of the trial that service is being provided on a trial basis, that any non-approved devices are for testing only and that all equipment must be returned at the end of the trial period. VPNet further acknowledges that it will retrieve the end user devices from the users at the end of the trial. In particular, all end users will be notified that the service they will be receiving is being provided in part or in whole under experimental authority, and that as a condition of the experimental license, VPNet may be required at any time, without prior notice, to cease operations in the 3550-3650 MHz band. In addition, VPNet acknowledges and will notify users that all customer premise equipment authorized under the experimental license must be rendered inoperable in the 3550-3650 MHz band at the conclusion of the trial to the extent the equipment is not useable under Part 96 rules. At the end of the trial, VPNet will either: (1) shut off the service immediately, stop billing users for the service and post a public notice at www.vpnet.net, and collect or render all customer premise equipment inoperable, or (2) change the frequency and operating parameters of some or all of the equipment that is part of the trial to parameters authorized under Part 90, Subpart Z of the FCC rules (which may materially impact network capacity, performance, and quality of service), post a public notice to www.vpnet.net, and allow users to opt out of the modified service offering with no further obligation to pay for the service.