

# Pilot Communications

## Experimental License Request

### *Statement*

Pursuant to Section 5.63(c)(1) of the Commission’s Rules, Pilot Communications (“Pilot”) hereby provides this narrative statement in support of its application for an experimental license to conduct a market trial, as defined in Sections 5.5 and 5.602, using spectrum in the 3550-3650 MHz in several counties in Northern California.<sup>1</sup> Pilot requests a license term of the shorter of (a) two (2) years from grant of the application, or (b) Pilot’s grant of authority from a Spectrum Access System (“SAS”) and Environmental Sensing Capability (“ESC”) to operate the authorized equipment and facilities on a General Authorized Access (“GAA”) basis.

### *Overview*

Pilot is a fixed wireless broadband provider that holds a nationwide non-exclusive 3650-3700 MHz service license (Call Sign WQPR713). Pilot is starting up in a market with a population of over 300,000 residents in Stockton, California. Outside of the metropolitan Stockton-Lodi-Manteca areas, Pilot will focus on rural and difficult to serve locations. Pilot uses 5 GHz unlicensed, and also has a Millimeter Wave (76-86 GHz) license, in addition to the “lightly licensed” spectrum in the 3650-3700 MHz band. Over time, Pilot has determined that, in many areas, the 3650-3700 MHz band offers the best combination of throughput, propagation, cost and equipment solutions to deliver high-quality broadband service to its subscribers and others in the target markets that lack access to competitive broadband services. Pilot is exploring deploying wireless broadband with smaller cells located closer to the subscriber, with an eventual plan to offer “Gigabit Wireless” services using the 60 GHz band. This will truly bring high-speed to rural markets, with speeds easily exceeding gigabit, many times that of other providers.

Pilot agrees with the Wireless Internet Service Providers Association (“WISPA”), which has supported the creation of the Citizens Broadband Radio Service (“CBRS”), including the inclusion of the 3650-3700 MHz band, with the hopes that adequate protections and policy would be adopted to facilitate a smooth transition from the Part 90 to the Part 96 rule framework. Pilot believes that the *CBRS Order*,<sup>2</sup> along with the ongoing development of the SAS and ESC, represents a positive change in spectrum management policy, and will eventually result in extremely efficient and widespread use of this 150 megahertz of spectrum for both small cell technologies for mobile wireless broadband and low power macro cell technologies for fixed wireless broadband in rural and underserved locations.

---

<sup>1</sup> 47 C.F.R. §§ 5.5, 5.63(c)(1) and 5.602.

<sup>2</sup> See *Amendment of the Commission’s Rules with Regard to the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015) (“*CBRS Order*”).

In addition, the equipment market is evolving to a standards-based LTE platform that relies on software-defined base station radios and encompasses a large, rapidly developing global equipment and technology ecosystem. Because of these attributes and the future ability to operate within the 150 megahertz between 3550-3700 MHz, Pilot intends to deploy in the 3650-3700 MHz band for new areas and to upgrade existing unlicensed operations to the 3650-3700 MHz band to improve customer experience and better compete. When permissible, Pilot expects to utilize a combination of Priority Access Licenses (“PAL”) and GAA “license by rule” spectrum across the entire 150 megahertz of spectrum. However, to date, there is no Part 90 certified equipment that incorporates the functionality needed to comply with new Part 96 requirements, partially due to the fact that there is no certified SAS and ESC, and the technical specifications for the SAS and ESC are still under development.

In order to determine the financial and technical viability of the CBRS band and assess consumer acceptance at various speeds and price points, Pilot seeks an experimental license to use spectrum in the 3550-3650 MHz band in Northern California, for testing in its primary markets of San Joaquin County, Napa County, Shasta County and Stanislaus County. While these counties certainly have some suburban and urban areas, they have surprising amounts of rural areas too, with agricultural and residential operations in far-flung corners far beyond any cable or DSL services. Coverage and deployment are severely restricted by rugged terrain and dense foliage that makes line-of-sight propagation impossible over longer distances from existing towers. Moreover, Pilot will be using all available 3650-3700 MHz spectrum such that further deployment in that band would result in harmful self-interference. Pilot plans to use Telrad LTE equipment on an experimental basis to determine whether and to what extent such deployment can resolve the line-of-sight propagation issues. In sum, this experiment will inform Pilot’s business, investment, technology and deployment decisions as it plans for expansion and densification of its broadband networks.

### ***Description of Program***

Because the Commission has not yet certified equipment for use with the SAS or the Environmental Sensing Capability (“ESC”) in the CBRS band, Pilot plans to use Telrad equipment certified by the FCC for use in the 3650-3700 MHz band that is re-tuned to the 3550-3650 MHz band. 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.<sup>3</sup>

Pilot selected these areas due to proximity to its engineering offices and relationships with site owners and customers that will be willing to participate in the market trial experiment. Pilot has access to and is transmitting on other frequencies from existing towers and operation in these counties with personnel on site to monitor construction and operation, to ensure that there will be no harmful interference to Incumbent Access users and to remedy harmful interference in the unlikely event it occurs. Further, Pilot agrees that it will obtain the consent of any grandfathered

---

<sup>3</sup> See *Amendment of the Commission’s Rules with Regard to the 3550-3650 MHz Band*, Order on Reconsideration and Second Report and Order, GN Docket No. 12-354, FCC 16-55 (rel. May 2, 2016).

3650-3700 MHz satellite earth station licenses within 150 km, and will obtain the consent of NTIA with respect to any Government radiolocation facilities within 80 km, prior to commencing its proposed experimental operations.

Pursuant to this market trial, Pilot plans to test different broadband speeds and price points to determine the utility and value of CBRS as it relates to consumer take rates and network performance. Over time, Pilot may test with different equipment as it becomes available. Pilot never sells any of the RF-operating Customer Premise Equipment to the end user, so it easy to comply with the market trial requirements of Section 5.602(d); Pilot will own the CBSD and End User Device equipment, and will not transfer ownership to trial participants. Pilot seeks authority to deploy up to 20 base stations consisting of 3 to 4 CBSD sectors each and up to 500 End User Devices, which it believes is the minimum quantity necessary to conduct the two-year trial proposed in this application due to the need to measure aggregate signal levels at the edge of a Census Tract or Wireless Protection Zone.

As required by Section 5.602(e), all end users 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. Pilot further acknowledges that it will need to retrieve the devices from the users at the end of the trial. In particular, all 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, Pilot may be required at any time, without prior notice, to cease operations in the spectrum between 3550 and 3650 MHz. In addition, Pilot acknowledges and will notify users that all customer premise equipment authorized under the experimental license remains the property of Pilot, and must be collected or rendered inoperable at the conclusion of the trial. At the end of the trial, Pilot will either: (1) shut off the service immediately, stop billing users for the service and post a public notice at [www.pilotcommunications.com](http://www.pilotcommunications.com), and collect or render all customer premise equipment inoperable, or (2) change the frequency and operating parameters of some or all of the customer premise 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.pilotcommunications.com](http://www.pilotcommunications.com), and allow users to opt out of the modified service offering with no further obligation to pay for the service.

Pilot plans to conduct its trial in two phases. In the first phase, Pilot will deploy with equipment certified for use in the 3650-3700 MHz band, and operating in 3550-3650 MHz band at various architectures and speeds. In the second phase, which will begin when SAS and ESC alpha and beta testing is viable with at least one party, Pilot will incorporate experimental SAS/ESC integration of equipment into the trial.

## ***Objectives of Experimental Program***

During the trial, and prior to the certification of a SAS and ESC, Pilot will comply with the power levels in Section 96.41 as they apply to End User Devices and Category B CBSDs. At the conclusion of the requested experimental license term, Pilot 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. Pilot hopes that the equipment and SAS/ESC development can be accelerated through the information generated by the market trial.

In addition to the technical objectives, the objective of determining the value and utility of PALs exists, which necessitates charging for the service at varying price points and performance levels.

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 models ability to predict co-channel interference, blocking, and OOB to comply with protections of existing FSS Earth Stations.

*Section 96.21* - Validate propagation models ability to predict co-channel interference, blocking, and OOB to comply with protections of Grandfathered Wireless Broadband Licensees.

*Section 96.25* - Validate propagation model's ability to predict compliance with PAL Protection Areas.

*Section 96.39(a)* - Develop a method for determining CBSD locations with sufficient accuracy to comply with this section.

*Section 96.39(d), (e)* - Develop methods for collecting Signal Level and Frequency information from the CBSD so it can be reported to the SAS.

*Section 96.41* - Determine the appropriate power levels for CBSD and End User Devices 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 CBDS and End User Device from other GAA and PAL users so it can be reported to the SAS.

***Contribution to the Radio Art***

In accordance with Section 5.63(c)(1), Pilot expects that its market trial will contribute greatly 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, Pilot expects to learn a significant amount of information about equipment capabilities and limitations, customer acceptance at various speeds and price points, and integration of its service and equipment with the SAS and ESC. To the extent permitted by SAS and ESC administrators and equipment providers, Pilot will share the results of its market trial with the Commission.