



September 9, 2015

Via Electronic Filing

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Re: Notice of Ex Parte Communication: *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354

Dear Ms. Dortch:

On September 2, 2015, Dr. Preston Marshall and Austin Schlick of Google Inc. met with John Leibovitz, Kamran Etemad, Chris Helzer, Roger Noel, Paul Powell, and Becky Schwartz, all of the Wireless Telecommunications Bureau, as well as Ira Keltz, Navid Golshahi, and Robert Pavlak of the Office of Engineering and Technology. I joined the meeting by telephone. During the meeting, the Google representatives made the following points with respect to the Commission's order allowing commercial wireless devices to share the 3550-3700 MHz band with existing users.¹

In allowing opportunistic use of unused Priority Access (PA) spectrum, the Commission should adopt an engineering-based definition of "use." We reiterated our proposal that an area should be defined as "in use" by a PA licensee when the licensee requests and receives from a SAS a spectrum assignment to operate in a particular geographic area.² The scope of these requests, including the geographic areas for which protection is sought, should be based on engineering analysis of actual operations, which licensees should document at the time protection is requested.³

The Commission should not require all SASs to rely on the same propagation model or inputs.⁴ During the meeting, the Google representatives stressed the importance of innovation in SAS services, as well as the devices they serve. To enable continued innovation and increasingly effective use of the 3.5 GHz band, the Part 96 rules

¹ See *In the Matter of Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd. 3959 (2015) (Report and Order).

² Reply Comments of Google Inc. in Response to the Second Further Notice of Proposed Rulemaking, GN Docket No. 12-354, at 2-4 (filed Aug. 14, 2015).

³ *Id.*

⁴ *Id.* at 14-17.

and SAS certification process should enable SAS providers to innovate in areas such as propagation models and bilateral coexistence mechanisms. Indeed, a SAS provider using more precise algorithms or additional data may be able to permit the entry of a Citizens Broadband Service Device (CBSD) even though another SAS could not rule out harmful interference and therefore would not be able to permit entry. In this situation, there is no conflict between the SAS providers, and no reason to doubt the appropriateness of the outcome. The SAS that grants access does so correctly, based on its calculations establishing the absence of harmful interference. Yet the SAS that denies access is not "wrong": The methods it uses for analysis cannot assure non-interference, so it rightly rejects the request. This example illustrates how improved SASs can make the 3.5 GHz band more usable overall. Moreover, mere variation in capabilities does not allow interference to occur because both SASs adequately protect higher-priority users.

To provide a common framework while allowing continued innovation, the FCC could establish a set of methods that constitute a "safe harbor" for purposes of SAS certification.⁵ SAS providers who wish to extend these methods would have the burden of providing a well-documented, justified, and transparent basis for their alternative methods, which could include community review such as peer-reviewed journal articles. The detailed propagation and scatter loss data that is used today in planning cellular deployments provides an example of the sort of inputs that would be acceptable. This advanced data should be usable by SAS providers to maximize the available spectrum in the band, while maintaining the interference protections required by Part 96.

End user devices should not be required to support an automated geolocation capability.⁶ Requiring all devices to geolocate could limit the form factor and utility options for end-user devices, and geolocation may be impractical in many indoor environments.⁷ A restrictive geolocation requirement, moreover, is not necessary to protect incumbents from harmful interference. SAS providers can take into account the "cloud" of end-user devices associated with a particular CBSD when calculating interference protection, regardless of whether those end-user devices are equipped with geolocation capability.⁸ It is Google's understanding that the Wireless Innovation Forum's multistakeholder group is reviewing a contribution that addresses the issue of how to treat end-user devices in interference calculations. Once the critical technical issues are resolved, appropriate treatment of the end-user cloud can be addressed in the SAS certification process, rather than through an unnecessary and burdensome geolocation requirement.⁹ Furthermore, industry groups, including WinnForum and Wireless Internet Service Providers Association (WISPA), have discussed creating standards, training materials, and certification procedures for trusted installers of CBSDs to ensure the integrity of the location information on which SASs will rely when a CBSD does not have geolocation capability.

⁵ *Id.* at 13.

⁶ *Id.* at 18.

⁷ *Id.* at 18-19.

⁸ *Id.* at 19.

⁹ *Id.*

The Commission should clarify or correct its rules regarding the process by which CBSDs vacate spectrum in response to information about the presence of federal systems. The rules adopted earlier this year create an unworkable and confusing set of timelines for clearing spectrum in response to federal incumbent activity. In section 96.39 of its Rules, the Commission requires a CBSD to “cease transmission, move to another frequency range, or change its power level within 60 seconds as instructed by an SAS.”¹⁰ But in section 96.15, the Commission requires a SAS to “confirm suspension of the CBSD’s operation or its relocation to another unoccupied frequency, if available” within 60 seconds of receiving an environmental sensing capability’s (ESC) communication “that it has detected a signal from a federal system in a given area.”¹¹ Thus, while section 96.39 contemplates that a full minute may elapse between a SAS’s command to vacate spectrum and a CBSD ceasing transmission, section 96.15 could be read to imply that communication must take place in less than one minute because it allots only one minute for communications to pass from an ESC to a SAS and then on to a CBSD.

In addition to their potential inconsistency, sections 96.39 and 96.15 impose requirements on SAS providers and devices that may be difficult to meet in practice. Multiple SASs will need to execute and confirm instructions to vacate spectrum, and each must then exchange information with all other SAS providers. This distributed architecture will involve “complex non-linear transmission, queuing, and processing delays that will require ongoing design, tuning, and optimization.”¹² As a result, we agree with the Wireless Innovation Forum that the Commission should allow 600 seconds for relocation of CBSDs, rather than 60 seconds, in response to a ESC command to vacate spectrum.¹³

Pursuant to the Commission’s rules, this notice is being filed in the above-referenced docket for inclusion in the public record. Please contact me should you have any questions.

Respectfully submitted,



Aparna Sridhar
Counsel
Google Inc.

cc: *Via electronic mail*
John Leibovitz
Kamran Etemad
Chris Helzer

¹⁰ 47 C.F.R. § 96.39(c)(2).

¹¹ 47 C.F.R. § 96.15(a)(4); § 96.15(b)(4).

¹² See Petition for Reconsideration of Wireless Innovation Forum, GN Docket No. 12-354, at 4 (filed July 22, 2015).

¹³ *Id* at 4.

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