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VIA ECFS

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

Re: Notice of Ex Parte – 3.5 GHz Spectrum Access System ("SAS") Administrator(s) and
Environmental Sensing Capability ("ESC") Operator(s) Applications, GN Docket No. 15-319.

Dear Ms. Dortch:

On January 18, 2018, executives of Federated Wireless, Inc. ("Federated"), including Kurt Schaubach (CTO), and Ross Vincenti (CLO), together with their counsel Edward "Smitty" Smith and engineering advisor Ira Keltz from DLA Piper LLP (US), met with Federal Communications Commission ("FCC") staff to discuss the Citizens Broadband Radio Service ("CBRS") requirement for Spectrum Access System ("SAS") public testing. The following individuals from the FCC were in attendance: Julius Knapp and Bahman Badipour from the Office of Engineering and Technology, Donald Stockdale, Matthew Pearl, Nese Guendelsberger, Paul Powell, Kamran Etemad, and Anthony Patrone from the Wireless Telecommunications Bureau and David Schmidt from the Office of Managing Director.

During the meeting, Federated discussed its perspective regarding how the SAS public testing requirement fits into the overall SAS certification program which also includes extensive laboratory testing. As detailed more fully in the attached presentation deck, Federated emphasized that the public testing should focus on issues that cannot be tested in the laboratory, such as how users will interact with the SAS to register for assignments or to report interference. Federated also emphasized the need for the FCC to set the public testing requirements early in the process as extensive planning and preparation are needed before such testing can commence. The company proposed that the Commission consider using results of the extensive field testing it, as well as other potential SAS Administrators, have done as a way to satisfy many of the public testing requirements. Federated indicated that it is willing to socialize these ideas with other SAS Administrators to help obtain a consensus testing framework to include outreach to incumbent users to solicit participation in such testing. Putting this framework in place is essential to ensuring public testing can commence in a timely manner.

Respectfully submitted,

DLA Piper LLP (US)

/s/ Edward Smith

Edward Smith
Partner

NV

cc: Julius Knapp
Donald Stockdale
Matthew Pearl
Nese Guendelsberger
Kamran Etemad
Paul Powell
Bahman Badipour
Anthony Patrone
David Schmidt

SAS Public Testing

January 18, 2018

Public Testing Requirement

- CBRs Report and Order (paragraph 372)
“At a minimum, applicants will be required to allow their systems to be tested and analyzed by FCC staff prior to making their systems available for a period of public testing prior to release.”
- SAS and ESC Administrators Public Notice (DA 15-1426)
“There will also be a public testing period – including testing of protections for non-federal incumbent systems and field trials.”
- Chiefs of OET and WTB have delegated authority to oversee testing
47 CFR §§ 0.241(j) and 0.332(f)

Our Perspective

- Definition of successful test or test outcomes must be clearly defined
- Public Testing should focus only on unanswered issues; repeating tests conducted in the lab serves no useful purpose
 - Other FCC objectives can be verified in Public Testing
- We need to start now to avoid any delay in the launch of CBRS
 - ITS lab testing is anticipated to complete 2Q 2018
 - Planning and preparation is needed before public testing can commence
 - Stakeholders need to be engaged

CBRS is Subject to an Extensive and Transparent Testing Process

CBRS Is Fundamentally Different from White Spaces

- More transparency: Multi-stakeholder participation in the development and approval of all SAS and ESC technical requirements and specifications
 - Includes SAS administrators, equipment vendors and incumbent protected users
- More thorough test requirements: Over 10,000 person hours committed to develop stakeholder approved test specifications and software test code
- More rigorous lab testing: SASs and ESCs will be tested by a full team of NTIA ITS software experts and engineers
- Extensive field testing: Federated Wireless has already completed 20+ OEM partner integrations to its SAS and 30+ SAS demonstrations and technical trials
 - Additional field tests conducted by other SAS administrators and equipment vendors

Commission's October 30 Meeting

Commission staff stated that public testing should incorporate certain elements

- Public test period should be brief
- Public testing should not be overly burdensome
- Commission stated need to verify:
 - Protection criteria are implemented correctly
 - Interference reporting is handled correctly
 - SAS and CBSD are communicating correctly
 - Professional installation
 - SAS can scale for larger number of CBSDs
 - Ensure SAS-to-SAS synchronization works properly

Proposed Comprehensive Test Framework

SAS testing is a four part program where each part is focused on specific elements and avoids duplication

ITS Testing	Equipment Certification Testing	Experimental Field Trials	Public Testing
Scope of testing Lab testing by ITS in accordance with WINNF developed test standard Implement ITS developed test plan	Scope of testing Lab testing by FCC Certified Labs in accordance with FCC TCC process	Scope of testing SAS administrators, equipment vendors, and CBRS users engaged in numerous trials to verify both SAS and equipment operate in accordance with rules	Scope of testing Public facing components of SAS
What's verified/confirmed Verify that SAS responds appropriately to variety of operating conditions <ul style="list-style-type: none">• Incumbent protection – Federal radar, FSS, GWBL• PAL contours• Assignment algorithms<ul style="list-style-type: none">• PALs only below 3650 MHz• CBSD relocation and shut down criteria• Category A / Category B• Aggregate bandwidth and/or area	What's verified/confirmed Ensure equipment is designed and works in accordance with Part 96 equipment rules <ul style="list-style-type: none">• Technical parameters• Response to SAS instructions• Cease operating when directed or when link to SAS is lost• Test that device reports change of location• Ensure security requirements are implemented	What's verified/confirmed SAS administrators and equipment vendors testing all aspects of CBRS operation including all elements incorporated by ITS, lab and public testing	What's verified/confirmed Verify interactions with SAS work properly <ul style="list-style-type: none">• Apply for PAL assignment• Apply for GAA assignment• Verify registration information (FSS, GWBL) is in database• Interference reporting mechanism

Incumbent Protection

Best demonstrated in a controlled, laboratory test environment

- Three elements combine to assure incumbent protection
 - Protection Criteria: FCC defined
 - Protection Methods and Models: FCC defined and/or WINNF standardized
 - Implementation: SAS Administrator
- For certification a SAS needs to demonstrate its implementation
 - The applicability of the protection criteria, methods, and models is not a SAS Administrator responsibility
- SAS function in a “lab simulated” or “field test” environment is the same
 - Same databases, criteria, methods, and models used to determine incumbent protection
- Field testing has many variables, making it difficult to isolate and verify the SAS implementation
- Controlled lab testing permits verification against reference models for a variety of FCC/ITS developed scenarios

Public Testing

Proposed key elements:

- Brief
 - 45 days or less
- Flexible
 - SASs are being implemented differently; the public testing program must adapt to these vagaries
 - SAS functions are complex do not produce identical results; rigid testing program may not be logistically possible
- Begin as early as possible
 - Can be concurrent with ITS testing
 - Public testing elements are separable from lab testing
- Leverage industry activity and participation for efficiency and scale

Proposal: Substantial Service Type Metric

- Can be tailored/flexible for each SAS
- Experimental field trials to serve as proxy for public testing
 - Commission can define scenarios to demonstrate (benchmarks)
 - Commission can specify the conditions/parameters under which existing field trials would apply (safe harbors)
- SAS Administrator documents scenarios, testing, and outcomes
 - Report can be made available for public comment

Why Substantial Service Requirement Makes Sense

- Real world testing is better than simulations
- Most testing already covered by ITS and equipment certification procedures

Commissions Stated Objectives (from October 30 meeting)	Substantial Testing Conducted By:	Stakeholders
Protection criteria are implemented correctly	ITS/Lab Tests	Federal agencies FSS licensees GWBL PAL GAA
Interference reporting is handled correctly	Equipment Certification	
SAS and CBSD are communicating correctly	Equipment Certification	
Professional installation	Industry certified (No FCC criteria exists)	
SAS can scale for larger number of CBSDs	Experimental Field Trial	
Ensure SAS to SAS synchronization works properly	Lab testing / SAS administrator certification / Experimental Field Trial	

- ITS testing, equipment certification process and experimental field trials are more extensive than any possible public testing/simulations
- Missing piece is public interface/interaction with database – applying for PAL, GAA or reporting interference

Next Steps

- Federated Wireless can take lead and socialize substantial service idea with other SAS administrators to obtain consensus approach
 - Flexibility still needed in actual implementation as each database is implemented differently
- Commission must provide guidance on requirements, metrics and timing soon
 - Ideally by end of January, but at least by the time ITS testing begins
 - Substantial planning needed to implement any testing requirements regardless of Commission's decision on approach