

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

In the Matter of)	
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Amendment of Part 101 of the Commission’s Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees)	WT Docket No. 10-153
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Request for Interpretation of Section 101.141(a)(3) of the Commission’s Rules Filed by Alcatel- Lucent, Inc., <i>et al.</i>)	WT Docket No. 09-106
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Petition for Declaratory Ruling Filed by Wireless Strategies, Inc.)	WT Docket No. 07-121
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Request for Temporary Waiver of Section 101.141(a)(3) of the Commission’s Rules Filed by Fixed Wireless Communications Coalition)	

COMMENTS OF SPRINT NEXTEL CORPORATION

Sprint Nextel Corporation (“Sprint”) hereby respectfully submits its consolidated comments on the Notice of Proposed Rulemaking and Notice of Inquiry in the above captioned proceeding.¹ In this NPRM/NOI, the Federal Communications Commission (“Commission”) seeks comment on proposals for removing regulatory barriers to the use of spectrum for wireless backhaul and other point-to-point and point-to-multipoint communications. Sprint agrees that more flexible regulations may help promote access to new alternative backhaul solutions, at least in some circumstances. Access to

¹ *Notice of Proposed Rulemaking and Notice of Inquiry*, WT Docket Nos. 10-153, 09-106, 07-121; FCC 10-146 (August 5, 2010) (“NPRM/NOI”).

affordable backhaul services is critical to the deployment of wireless broadband and other wireless communications services.²

As a licensee of hundreds of microwave stations, Sprint appreciates the Commission's initiative to permit more flexible, cost-effective and intensive use of microwave spectrum. In these comments, Sprint briefly addresses the Commission's proposals to: (1) allow Fixed Service (FS) operations to share certain spectrum bands currently used by the Broadcast Auxiliary Service (BAS) and the Cable TV Relay Service (CARS); (2) permit licensees to use adaptive modulation that may temporarily drop below the existing minimum payload capacity requirements under certain circumstances, enabling FS links – particularly long links in rural areas – to maintain critical communications during periods of fading; and (3) permit FS licensees to operate “auxiliary stations” in conjunction with traditional microwave links.

Sprint also briefly comments on questions raised in the NOI: (1) whether lowering the current efficiency standards in rural areas would lower costs associated with providing backhaul service; (2) whether smaller antennas should be permitted in any FS band, thereby facilitating increased deployment of FS facilities without causing increased interference; and (3) whether additional modifications to the Part 101 rules, or other policies or regulations, would promote flexible, efficient and cost-effective provisions of wireless backhaul service.

Sprint notes, however, that regardless of the Commission's actions in this docket, the broader issue of special access service must be addressed if the rapid expansion of wireless broadband is to be achieved. Microwave alternatives will not correct the broken

² NPRM/NOI at para. 1.

special access market and Commission action on this critical input to wireless services needs to be taken immediately.

Making Additional Spectrum Available for Part 101 FS Operations

The Commission proposes to permit FS users to share existing bands allocated solely to BAS and CARS use at 6875-7125 MHz and 12700-13200 MHz.³ The Commission also seeks comment on the best approach to channelization of these bands, noting that existing BAS and CARS operations may use 25 megahertz bandwidth channels in both bands and that CARS operations at 12700-13200 MHz may also use 6 megahertz and 12.5 megahertz channels.⁴ The Commission proposes to apply the same technical parameters that currently apply in the Upper 6 GHz band (6525-6875 MHz) to the adjacent 6875-7125 MHz band. The Commission also proposes to add the current 11 GHz (10700-11700 MHz) minimum payload capacity and loading requirements contained in Section 101.143 of the Commission's rules to the existing technical rules that govern the 12700-13200 MHz band.⁵

Sprint agrees that the additional capacity that could become available in some places by permitting expanded FS operations, such as backhaul used to support broadband services, in these bands is in the public interest. Due to significant congestion in the existing 6 GHz microwave bands, permitting FS operations on frequencies previously limited to BAS and CARS operations would be beneficial and cost effective as existing FS equipment could be used on the adjacent BAS and CARS channels. Also, these bands could support new microwave backhaul operations that are less susceptible to rain fade as compared to microwave bands at higher frequencies.

³ NPRM/NOI at para. 13.

⁴ NPRM/NOI at para. 18.

⁵ NPRM/NOI at para. 20.

Sprint supports a channelization scheme for the 6875-7125 MHz band that would permit common microwave channel sizes (such as 5, 10, and 30 megahertz), as well as the existing channel sizes used by current BAS and CARS licensees, as the Commission proposes. This would accommodate both traditional BAS and CARS operations, as well as new FS operations. Sprint also generally supports the Commission's proposal for both common microwave channel sizes and the existing BAS/CARS channel sizes at 12700-13200; however, we specifically request that both 40 and 50 megahertz channels also be permitted in this band. The 11 GHz band already permits 40 megahertz channels, and the 18 GHz and 23 GHz bands permit 50 megahertz channels. Permitting these larger channel sizes in the 12700-13200 MHz band would facilitate backhaul for broadband uses in those areas where it is feasible to do so.

The Commission should adopt technical parameters for the 6875-7125 MHz band based on the existing requirements of the Upper 6 GHz band. However, Sprint suggests that the Commission permit the use of smaller antennas in the 6875-7125 MHz band based on the Category A and Category B approach currently permitted in the 11 GHz band.⁶ Under this approach, smaller and less expensive Category B antennas could be used unless another FS, CARS or BAS licensee makes a showing that it is likely to receive interference and such interference would not exist if a larger, more directional Category A antenna were used. Sprint supports the Commission's proposal to augment the existing technical rules that already apply to the 12700-13200 MHz band with the minimum payload capacity and loading requirements currently applicable to the 11 GHz band.

⁶ See 47 C.F.R. §§ 101.115(b) and 101.115(f).

Adaptive Modulation

The Commission proposes changes to the fixed microwave rules that would allow transmitters to use adaptive modulation to compensate for reduced propagation conditions that can occasionally occur.⁷ In particular, the Commission proposes to permit licensees to temporarily drop below the existing minimum payload capacity requirements in certain limited circumstances.⁸

Sprint supports the Commission's proposal to allow adaptive modulation as this would reduce costs and allow for better microwave performance over longer distances, particularly in rural areas, and in a variety of atmospheric conditions. Sprint believes that a microwave license applicant should be required to file only for the largest data rate and highest modulation that would be used.⁹ If frequency coordination is completed at the highest data rate and modulation, there should be no concerns about the interference potential at slower rates. Sprint suggests that limits be placed on the amount of time that transmitters may operate below the minimum payload capacity and loading requirements to ensure that spectral efficiency is maintained; however, exceptions to such time limits could be permitted when significantly less than normal propagation exists because of atmospheric conditions.

Auxiliary Stations

The Commission proposes to permit the operation of "auxiliary" stations that would operate on the same frequencies and in proximity to a main licensed point-to-point

⁷ Transmitters with adaptive modulation are able to lower their data transmission rates to compensate for poor signal propagation conditions. Under the current rules, if the data transmission rate were to go below the minimum payload capacity specified in the rules, the transmitter must cease operations.

⁸ NPRM/NOI at para. 28.

⁹ Currently the Commission routinely requires the filing of all data rates and all modulations that might be used.

link. The Commission proposes that each auxiliary station: 1) must operate on the same frequencies as the main licensed link; 2) must not cause any incremental interference to other primary links; 3) must be secondary in status and have no right to claim protection from interference from primary stations; 4) would have to be coordinated in advance; 5) would have to be licensed as an addition to the main link; 6) may not communicate directly with another auxiliary station; 7) would not be subject to the antenna standards and minimum path length requirements that apply to the main links; 8) would be exempt from loading and path length requirements, or would be allowed to be used to aggregate loading requirements to determine main link compliance; and 9) would be subject to FAA tower clearance and compliance with environmental requirements.¹⁰

Sprint supports the authorization of auxiliary stations on a secondary basis as proposed in the NPRM. Such authorization would provide more efficient use of the microwave bands, as well as flexibility to match the microwave backhaul capacity to the needs at specific locations. It also has the potential for reducing the cost of microwave backhaul in some situations.

Sprint envisions these auxiliary stations will allow for relief in congested microwave bands such as the Lower 6 GHz Band. Because each link would be fully studied and coordinated, interference should not occur to other microwave operations. Sprint envisions an opportunity to deploy these types of microwave links in areas where other options for replacing or expanding existing backhaul capabilities to a cell site are cost prohibitive or physically constrained. Although not always feasible, a wireless backhaul option could mitigate these challenges in some circumstances, especially in

¹⁰ NPRM/NOI at para. 52.

dense, urban environments where auxiliary stations could be deployed to accommodate several cell sites in need of backhaul.

Although building access, zoning and other typical issues affecting siting will need to be addressed, Sprint submits that these types of auxiliary stations could be developed in small, strategic numbers where backhaul capacity could be diversified among several cell sites densely deployed in the radius that a microwave's beam creates, which is larger among 6 GHz microwave patterns, and smaller with higher frequency microwave bands. Auxiliary stations are a promising alternative to network backhaul capacity challenges in some circumstances.

Modification of Efficiency Standards in Rural Areas

Sprint supports modifying Section 101.141(a)(3) to establish relaxed minimum payload capacities and minimum traffic loading payloads that would allow for greater microwave use in rural areas. Such revised efficiency standards could permit smaller antennas to be used, reducing the costs of deployment and allowing for more microwave backhaul deployment in rural areas. Reducing the minimum payload capacities and minimum traffic loading requirements in areas the Commission defines as rural would be beneficial particularly in the 6 GHz band, which is the only band that can be used for some longer links. Current rules requiring six foot microwave dishes in the 6 GHz band unnecessarily limits options for microwave backhaul in rural areas, especially in places with high annual rainfall.

In addition, Sprint sees advantages to modifying the efficiency standards because it would allow for more opportunities to provide backhaul for wireless data services. Sprint has found that broadband IP traffic can be quite "bursty" and licensees would be

able to provide higher bandwidth connections to locations defined as rural with relaxed efficiency standards.

Review of Part 101 Antenna Standards

Sprint supports reviewing antenna standards in certain microwave bands as updated standards permitting smaller dishes could facilitate increased deployment and decreased costs. As mentioned previously for the 12700-13200 MHz band, Sprint sees particular value in adopting antenna standards that would be similar to the current antenna standards in the 11 GHz band that allow for a smaller, less expensive Category B antenna that must be upgraded to a larger, more robust Category A antenna in the event that it is necessary to mitigate either real or potential interference. Antenna size is one of the factors that limits microwave deployment due to the accompanying lease costs, tower structure integrity and zoning. Current antenna standards could be relaxed in the 6, 18, and 23 GHz bands and in the 12700-13200 MHz BAS/CARS band. Sprint suggests that the following smaller antennas be permitted under the Category B approach: 4 foot dishes in the 6 GHz band, 18 inch dishes in the 12700-13200 MHz and 18 GHz bands, and 6 inch dishes in the 23 GHz bands.

Sprint also requests that the Commission permit the use of point-to-multipoint antennas with 30 or 60 degree beamwidths, subject to limitations on antenna size and transmit power. This would provide an opportunity to reduce antenna tower lease costs at hub locations since one hub antenna could effectively serve multiple remote locations and allow more remote stations to share the same frequency.

Increasing Flexibility Generally

Finally, Sprint offers several suggestions that would support the Commission's desire for input on ideas that would promote flexible, efficient and cost-effective provisions of wireless backhaul service. The first suggestion is to open additional bands for fixed services, especially in the Washington, DC and Denver, CO areas where some of the existing FS bands are encumbered with government operations. Over time, the Commission also should consider authorizing microwave channel bandwidths greater than 50 megahertz, as new mobile devices in the future may be capable of operating with data rates of 100 Mbps or more.

Sprint also suggests the Commission consider incentive-based adaptive power control rules that would allow more users and fewer antenna restrictions. Such rules could improve microwave band operations since less power radiating from transmitters naturally causes less potential for interference and permit additional users to gain access to the band. One possible incentive-based rule would be to permit a licensee using transmitter power below +8 dBm to use a Category B or even smaller antenna because the potential for interference would be reduced.

Sprint also recommends that the Commission develop more specific technical rules governing the use of spectrum masks above 15 GHz, which would allow for less variance in the interpretation of the Commission's rules by equipment vendors and enable more frequencies to be used while also reducing interference. Sprint believes that today's technology can enable microwave transmitters to be made to comply with such spectrum masks.

Finally, Sprint proposes that the Commission promulgate an additional set of Part 101 rules that govern the relationship between antenna power and distance above 15 GHz. These rules would allow for greater sharing of spectrum and increase the efficiency of frequency usage in these microwave bands. Sprint believes that establishing maximum power limits based on the link distance would create an environment that would encourage use of the minimum power necessary to achieve communications, in contrast to current rules that encourage maximum transmit power regardless of transmit distance thereby exacerbating the probability of interference and congestion in these bands.

In conclusion, Sprint believes that several changes should be made to the fixed microwave rules to increase efficient use of this spectrum for backhaul. Sprint reiterates, however, that regardless of the Commission's actions in this docket, the broader issue of special access service must be addressed if the rapid expansion of wireless broadband is to be achieved.

Respectfully submitted,

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