

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554**

In the Matter of)	
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Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies To Provide Spectrum-Based Services)	WT Docket No. 02-381
)	
2000 Biennial Regulatory Review Spectrum Aggregation Limits)	WT Docket No. 01-14
)	
Increasing Flexibility To Promote Access to and the Efficient and Intensive Use of Spectrum and the Widespread Deployment of Wireless Services, and To Facilitate Capital Formation)	WT Docket No. 03-202
)	

REPLY COMMENTS OF ERICSSON INC

Ericsson Inc (“Ericsson”) hereby submits reply comments in response to the Federal Communications Commission’s (“FCC” or “Commission”) *Notice of Proposed Rulemaking*, released October 6, 2003, to examine ways to promote rapid and efficient deployment of spectrum-based services to rural areas (“*NPRM*”).¹ Numerous parties submitted comments in support of easing regulatory burdens and eliminating unnecessary barriers to the deployment of spectrum-based services in rural areas. Ericsson provides these reply comments in further support of the goal of universal deployment of quality spectrum-based services, particularly in rural areas where there may be economic and other barriers to access.

¹ *Notice of Proposed Rulemaking, In the Matter of Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies To Provide Spectrum-Based Services, 2000 Biennial Regulatory Review Spectrum Aggregation Limits For Commercial Mobile Radio Services, Increasing Flexibility To Promote Access to and the Efficient and Intensive Use of Spectrum and the Widespread Deployment of Wireless Services, and To Facilitate Capital Formation*, WT Docket No. 02-381, WT Docket No. 01-14, WT Docket No. 03-202, 18 FCC Rcd. 20,802 (Oct. 6, 2003) (“*NPRM*”).

DISCUSSION

Shared Infrastructure

In its *NPRM*, the Commission sought comments on how it should view sharing arrangements, from a policy as well as a regulatory standpoint. In general, many commenters endorsed infrastructure sharing and encouraged the Commission to take steps toward facilitating such arrangements.² Ericsson supports these comments. In the discussion below, Ericsson provides actual examples of the potential of infrastructure sharing for the Commission's consideration. The examples help illustrate the benefits described by commenting parties. Ericsson agrees that infrastructure sharing offers a promising and economically viable means of providing spectrum-based services to rural areas. Ericsson also notes that these business relationships can include arrangements between (1) equipment providers and carrier(s); and (2) multiple carriers.

Small regional operators often face significant financial barriers to building out wireless networks. In light of such issues, Ericsson has been working with carrier partners to make network deployment more economically viable in rural areas. In this regard, Ericsson recently entered into agreements with three separate rural market operators, Missouri-based Chariton Valley Wireless Services, Pennsylvania-based Indigo Wireless, and Georgia-based PSC Wireless, to migrate their TDMA wireless networks to GSM through a shared infrastructure arrangement. The agreements will allow these operators to deploy a full-featured GSM network with less capital and operational expenses than traditional buildouts, thus demonstrating the real potential of infrastructure sharing.

² See, e.g., Comments of Cellular Telecommunications and Internet Association ("CTIA Comments") (filed Dec. 29, 2003) at 15-16, Comments of Rural Cellular Association ("RCA Comments") (filed Dec. 29, 2003) at 14.

Ericsson's managed core network capacity is a shared infrastructure offering that involves a core network that is built, and in various aspects operated, by the supplier and potentially shared among multiple users (referred to herein as "Shared Network"). In a typical Shared Network, the rural operator purchases, owns, or operates the radio access equipment.³ The equipment manufacturer owns and operates the core network infrastructure.⁴ The supplier takes the rural operator's calls from the operator's equipment (the BSC or BTS), switches them through the supplier's MSC, and then carries them back to the operator's BSC or BTS. In this way, the rural operator uses the supplier's equipment platform without having to purchase its own equipment. Thus, the Shared Network allows operators to quickly deploy wireless services in the most cost efficient manner.⁵

With the Shared Network, one or more rural operators can utilize the network to provide services to its subscribers with each operator connecting to the core network while maintaining and managing its own subscriber base.⁶ The overlaid radio system is connected to the supplier's transmission hub point and maintained by the operator. The operator still controls all of its existing PTSN connections and other transport agreements, as well as the connections from its system to the supplier's hub, up to the defined demarcation point.

Ericsson believes that its Shared Network is ideally suited for providing spectrum-based services to rural areas and illustrates the benefits of shared rural infrastructure. The supplier can

³ The Base Station Controller ("BTC") and/or the Base Transceiver Stations ("BTS").

⁴ The Mobile Switching Center ("MSC"), the Home Location Register ("HLR"), GPRS nodes, and network applications, such as MMS, SMS, and voicemail platforms, comprise the core network infrastructure.

⁵ The Shared Network consists of an MSC/HLR/AUC, BSC/TRC, GPRS Network, Service Order Gateway ("SOG"), Billing Gateway ("BGW"), Packet Backbone Network ("PBN"), Over-the-air Activation ("OTA"), and future nodes for service network applications such as Multi-Media System ("MMS") and Instant Talk (also known as "Push-to-Talk").

⁶ Additionally, a Customer Administration System ("CAS"), part of the Service Order Gateway ("SOG"), and an Operational Support System ("OSS") terminal are provided to each operator for administration of customer care and its radio network. Each operator will own the radio base stations and be responsible for the performance of its own radio network.

provide equipment and infrastructure while carrier partners provide services to their customers, all the while sharing costs among several companies. In many instances, capital barriers would prevent deployment of spectrum-based services in these areas absent such a cost-sharing solution. Since the Shared Network, like other infrastructure sharing arrangements, supports multiple carriers on a network, it also promotes competition in rural areas.

With respect to the regulatory standards that should apply, as the Commission noted in its *NPRM*, network sharing that does not involve a transfer of control does not require Commission pre-clearance.⁷ With a shared network, rural operators maintain significant and substantial control over the network, make key decisions, and provide services directly to their own customers. Thus, under the *Intermountain Microwave* test, no *de facto* “transfer of control” takes place that might trigger Section 310(d) review.

Nevertheless, Ericsson agrees with commenters that application of the same *de facto* standard adopted by the Commission for secondary markets to infrastructure sharing would provide greater regulatory clarity to all companies and would serve to further encourage these types of relationships.⁸ Carriers, in particular, would not have to worry about triggering 310(d) review by failing to meet one of the more rigid *Intermountain Microwave* prongs and would enter more freely into business relationships that would speed deployment of wireless services to rural areas. Licensees would ultimately remain responsible for operation under their own licenses and customers in rural areas would be served by having access to wireless services, including from multiple competitors supported by the shared infrastructure platform.

⁷ See *NPRM* at ¶ 102.

⁸ See, e.g., Comments of Cingular Wireless LLC (filed Dec. 29, 2003) at 12-14.

RUS Loan Program

Although Ericsson recognizes the importance of programs that are designed to facilitate access to capital for wireless investments, it shares the concerns expressed by some commenters that the program has proven to be of limited usefulness under its current rules.⁹ Of particular concern is the standard RUS contract, RUS Contract Form 397 (“Special Equipment Contract”), which places considerable commercial risk on equipment providers such as Ericsson.¹⁰ For example, the contract does not provide for standard UCC warranty disclaimers, or exclusions of incidental and consequential damages, which are customary commercial contract provisions. In addition, other provisions concerning damages and remedies do not permit suppliers such as Ericsson to accurately assess financial risk.¹¹ Until the contracting process becomes more commercially viable, suppliers may participate in only a limited way.

Increased Power Limits

The Commission sought comment on whether to increase power limits for stations located in rural areas. Numerous commenters favor exploring relaxed power limits to the extent it is responsibly balanced against potential interference and other concerns.¹² Ericsson shares this point of view and provides specific examples below of how relaxed power limits could result

⁹ See, e.g., Comments of Rural Telecommunications Group (“RTG”) and the Organization for the Promotion and Advancement of Small Telecommunications Companies (“OPASTCO”) (filed Dec. 29, 2003) at 12.

¹⁰ In its experience, Ericsson has found that administrators have virtually no ability to modify provisions of the standard contract, thus making it effectively non-negotiable.

¹¹ For example, the standard contract allows the accumulation of all damages available in law or equity. In addition, it permits the RUS administrator to enforce the rights and remedies of the operator utilizing RUS funding, regardless of whether the operator is satisfied with performance or has any intention of enforcing such rights. See, e.g., RUS Contract Form 397 Article V § 2 (“Liquidated Damages”), Article V § 3 (“Consequential Damages”), Article V § 4 (“Enforcement of Penalties by Administrator”), Article V § 5 (“Cumulative Damages”).

¹² See, e.g., RCA Comments at 9-10; CTIA Comments at 9-10.

in greater technical flexibility. In general, use of higher power would lead to improved coverage outdoors, indoors, and in vehicles,¹³ as well as overall improved performance.¹⁴

Relaxed power limits would, in particular, allow greater flexibility to use high gain directional antennas which would improve performance in both the reverse link and forward link directions, even with existing handsets.¹⁵ Increasing the antenna gain at the radio base station improves the forward link and reverse link at the same time which improves coverage, but also results in higher EIRP power outputs. In other words, with relaxed, or more flexible, output power limits, one could use a higher-gain, narrow beam antenna to balance the reverse and forward links.¹⁶ Balanced links, in turn, would improve service and coverage areas without requiring as many base stations, thus improving economic feasibility of such systems.

Reducing the number of necessary cell sites would be especially beneficial given the high construction costs and other financial challenges to deployment of wireless services in rural areas.

¹³ Technology exists with today's radio base stations in traditional 3-sector configurations (*e.g.*, tower mounted low-noise receiver amplifiers and 4-branch receiver antenna diversity) that makes it possible to balance the reverse link with higher output power in the forward link, but would exceed current power limits. For example, it is possible to balance an output power of 44 dBm at the antenna input which, with a very high-gain 23 dBi antenna, results in 67 dBm EIRP, or 5,000W.

¹⁴ New high-speed data technologies utilize link adaptation, which means that they adapt the data rate to the quality of the radio link (*e.g.*, signal strength for coverage). This is done on forward and reverse links independently, *i.e.*, the forward link may have a higher data rate than the reverse link if the forward link has a stronger signal. As a result, with higher output power from the radio base station it would be possible to provide higher data rates in the forward link in rural areas. With many data applications, the data rates will be highly asymmetric, therefore higher data rates in the forward link will be valuable.

¹⁵ Increasing the antenna gain at the radio base station improves both the forward link and reverse link at the same time which could improve coverage in rural areas. There are several ways to increase the antenna gain. For example, one could use a narrower horizontal lobe when selective coverage is sufficient (such as road coverage). One could also increase sectorization, such as 6-sector sites, or use a narrower vertical antenna lobe or smart antennas. However, a higher antenna gain also increases EIRP output power, which is already close to current power limits in rural areas, and thus makes such an approach for improving coverage not feasible.

¹⁶ A more flexible approach to output power limits may be to focus on safe power density levels when considering the minimum distance to the antenna (*e.g.*, tower height) and the direction of the antenna gain. The latter is important when a higher-gain antenna with a very narrow vertical lobe is used. In such a situation, the energy is focused towards the horizon where it is needed, thus reducing the energy transmitted towards the ground closer to the base station. As a result, the power density on the ground close to the base station will be lower, while the EIRP towards the horizon increases. Accordingly, this technology could improve both coverage (higher EIRP towards the horizon) and public safety (lower power density) at the same time.

CONCLUSION

Ericsson is working with carrier partners to facilitate the provision of wireless services to rural areas where costs and other barriers have acted as an impediment to rapid deployment. Ericsson commends the Commission for looking at different ways in which it can further the goal of rapid deployment of spectrum-based services to rural areas. Ericsson also urges the Commission to consider these reply comments in analyzing ways in which it can ease regulatory burdens to achieving this goal.

Respectfully submitted this 26th day of January, 2004.

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