

**Before the
Subcommittee on Communications and Technology
United States House of Representatives**

**Hearing on
“Creating Opportunities through Improved Government Spectrum Efficiency”**

**Statement of Mark Racek
Director, Global Spectrum Policy
Ericsson Inc.**

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Summary of Key Points

- Using innovation to empower people, business and society, we are working towards the networked society, in which everything that can benefit from a connection will have one.
- High-performing, cost-efficient, mobile networks depend on continued development of 4G/LTE technology and advanced network architectures, and will only exist with a robust mobile broadband ecosystem made possible by access to sufficient spectrum.
- Technology alone won't cure the demand for more spectrum. The allocation of additional licensed spectrum is the best way to relieve congestion and promote prosperity, jobs, and innovation.
- While spectrum legislation signed into law earlier this year was a key achievement, the question still remains – where can more spectrum be found?
- Federal spectrum holdings prove to be the next logical possibility given that the federal government is the largest user of spectrum below 3GHz.
- Spectrum sharing comes with a number of key challenges:
 - #1 Economic Potential - The value of spectrum is directly dependent upon the extent to which services can be guaranteed.
 - #2 Technical and Commercial Viability - The technical requirements for a shared environment are undefined and will require significant time for research and testing.
 - #3 Operational Complexity - For sharing to work, carriers will need clear answers to many questions about operational constraints.
 - #4 Regulatory Structures - Sharing raises a number of regulatory challenges all of which will take years to test and model.
- In conclusion, while spectrum sharing solutions can, in the right circumstances, support licensed operation and should be further assessed, sharing should not be considered a substitute for cleared, licensed spectrum to meet our nation's needs.

Written Testimony of Mark Racek, Ericsson Inc.

Thank you Mr. Chairman and good morning to all the members of the Committee.

My name is Mark Racek and I serve as Director of Spectrum Policy for Ericsson. In that capacity, I help lead the development of Ericsson's global legislative, regulatory, and industry positions with regard to spectrum. As communication changes the way we live and work, Ericsson is playing a key role in this evolution. Using innovation to empower people, business and society, we are working towards the networked society, in which everything that can benefit from a connection will have one.

For our part, Ericsson is responsible for more than 40 percent of the world's mobile traffic which passes through our networks every day serving roughly 2.5 billion subscribers. We are the fifth largest software company in the world. And we've been at this game a long time – when our company was founded 136 years ago, Ulysses S. Grant occupied the White House. With time has come experience, knowledge, and we believe, credibility.

The lifeblood of the networked society is a network that delivers what users want – wherever they are. This high-performing, cost-efficient, mobile network which in turn depends on continued development of 4G/LTE technology and advanced network architectures, will only exist with a robust mobile broadband ecosystem made possible by access to sufficient spectrum.

This subcommittee knows too well the severe spectrum shortfall our country faces due to sharp increases in spectrum demand. A market data report Ericsson released last month cited a doubling of global mobile data traffic from 2011-2012 with a growth forecast of 15 times that amount by 2017. Ericsson invests more than five billion dollars annually in research and development, employs 22,000 R&D engineers, and holds 30,000 patents in support of our effort to improve the capability of networks and increase the efficient use of spectrum. But technology alone won't cure the demand for capacity. The allocation of additional licensed spectrum is the best way to relieve congestion and promote prosperity, jobs, and innovation.

Mr. Chairman, you and your colleagues deserve a great deal of praise for passing voluntary incentive auction legislation contained in the 'Middle Class Tax Relief and Job Creation Act.' While this key achievement was an important step, less than a quarter of the 500 MHz needed by 2020 and outlined in the Administration's National Broadband Plan will likely be made available. Our industry is investing billions to drive spectral efficiency and performance in existing bands, but we know it won't be enough. So the question still remains - where can more spectrum be found?

Federal spectrum holdings prove to be the next logical possibility given that the federal government is the largest user of spectrum below 3GHz. And the new spectrum law is encouraging efficiency through collaboration with industry. For example, in the area of public safety, FirstNet's adoption of standards-driven LTE is a model that can be used by federal agencies to benefit from commercial technology

and increase spectral efficiency. In addition, federal agencies could also utilize commercial services wherever possible instead of relying on dedicated spectrum and dedicated systems. As similar opportunities are identified within the federal government, a determination must be made as to which approach will serve the solution best – spectrum clearing or spectrum sharing?

As a global leader in building networks that can operate in numerous spectrum ecosystems, I believe there are two key points to keep in mind as we answer that question:

First, clearing spectrum for licensed use is the best option available today. The engineering is ready and there is a well-established and commercial business model for providers to rely upon to profitably build and operate such systems.

Second, while there is a lot of interest in the concept of spectrum sharing, I would caution policymakers from being too optimistic about its potential. There are a host of technical and engineering challenges to building and operating networks that will rely upon shared spectrum and there is no evidence yet that business models exist to sustain them. The examples of challenges come in at least four areas:

#1 Economic Potential

The value of spectrum is directly dependent upon the extent to which services can be guaranteed. There has not been sufficient testing of technology or economic modeling to prove that the types of services consumers demand can be met by a

system predicated on sharing. Without these certainties, there will be little incentive for large scale investment.

#2 Technical

Existing commercial mobile technologies have been optimized based on well-understood licensed spectrum, which has fueled innovation and investment. The technical requirements for a shared environment, on the other hand, are undefined and will require significant time for research and testing. In addition, every sharing situation is unique. So even if one branch of government's spectrum is freed via sharing, there is no guarantee that another branch's spectrum can be utilized in the same way. In addition, many popular sharing technologies such as cognitive radio simply aren't commercially viable today.

#3 Operational

For sharing to work, carriers will need clear answers to many questions about operational constraints. For example, what kinds of services can be supported in a shared environment? Can the spectrum be used nationwide? What incentives will be in place to encourage collaboration between licensees?

And finally,

#4 Regulatory

Sharing raises a number of regulatory challenges all of which will take years to test and model. Will the users of shared spectrum have to meet public interest requirements such as CALEA and E-911? Can this spectrum be auctioned? What

about interference protections for incumbent users? Who will enforce issues that arise from interference or infringement? Who will develop the tests necessary to determine whether devices interfere? What legal rights will users and networks have with regards to federal spectrum?

These questions must be answered in advance to provide assurances for any potential operation to develop a business model for a shared environment.

Taken together, I believe that an analysis including these four factors leads us to the conclusion that while spectrum sharing solutions can, in the right circumstances, support licensed operation and should be further assessed, sharing should not be considered a substitute for cleared, licensed, spectrum to meet our nation's needs.

And when met, those needs will yield great returns for the economy.

In the future, we see a world where everything that can benefit from being connected, is connected. This will transform lives. It will revolutionize businesses. But more than that, it will have a profound impact on our entire society. Our industry needs spectrum to deliver on that promise. We at Ericsson stand ready to support Congress, the Administration, and our industry colleagues in meeting that goal.

Thank you, Mr. Chairman, for the kind invitation to be a part of this important discussion today and I look forward to answering any questions that you, or any other members of the committee, may have.