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

In the Matter of	)	
	)	
Unlicensed Operation in the TV Broadcast Bands	)	ET Docket No. 04-186
	)	
Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band	)	ET Docket No. 02-380
	)	
	)	

COMMENTS OF SHARED SPECTRUM COMPANY

Shared Spectrum Company supports the thrust of the Notice of Proposed Rule Making released by the Commission in the above-captioned proceeding on May 25, 2004, FCC 04-113.

Spatial and temporal spectrum "holes" comprise the bulk of the spectrum even in congested areas at peak times. Cognitive radios are designed to gain access for communications purposes to these holes. Shared Spectrum Company has been participating in measurements of such holes in the National Science Foundation's National Radio Research Testbed project ("NTNRT") managed by the University of Kansas Information and Telecommunications Technology Center, and has taken spectrum measurements in a variety of locations.

On June 14, 2004, Shared Spectrum filed a report in the Commission's Facilitating Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies, ET Docket No. 03-108, on measurements it made on the roof of the National Science Foundation building in Arlington, Virginia and at Riverbend Park, Northern Virginia. They showed the low occupancy of different spectrum bands from 30 MHz to 2900 MHz at a "worst-case" location (good line-of-sight visibility in a dense urban area) and at a "baseline" rural location. Subsequently Shared Spectrum took measurements at the most congested place in the country, New York City, and did so at a time of particularly high congestion -- during the Republican National Convention from August 31 to September 3, 2004 -- when security precautions and news coverage were at their peak.

Shared Spectrum's bottom-line conclusion is that, even in this severe congestion, no more than 16% of the spectrum was employed. While the 16% in New York City was much larger than the approximately 3% in Great Falls, it makes clear that the great majority of spectrum capacity is being left unused even in the most high-use case.

These vast spectrum holes can be identified and used by software defined radios ("SDR"), as described in Shared Spectrum's previous filings with the Commission in *Facilitating Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies Authorization and Use of Software Defined Radios* (ET Docket No. 03-108), *Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in Certain Fixed, Mobile and Satellite Frequency Bands*(ET Docket No. 03-237), *Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band* (ET Docket No. 02-380), and *Spectrum Policy Task Force Report* (ET Docket No. 02-135), *Software Define Radios* (ET Docket No. 00-47) -- which are incorporated herein by reference.

Improvements in detection equipment sensitivity permit ready detection of existing spectrum uses on a dynamic basis. A cognitive radio using these capabilities can change its transmitter parameters based on interaction with the environment in which is operates. This interaction may involve active negotiation or communications with other spectrum users and/or passive sensing and decision-making within the radio. Cognitive radio systems can be deployed in network-centric, distributed, ad hoc, and mesh architectures, and in both licensed and unlicensed applications.

The New York City measurements were taken from the roof top of the Stevens Institute of Technology Building in Hoboken, New Jersey. The measured data is reported in Appendix hereto. For background, Appendix B describes the measurement location and Appendix C the equipment used.

CONCLUSION

There is ample spectrum available for a major contribution to communications needs by cognitive radio.

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