

15 August 2002

FCC ELS

File Number: **0194-EX-PL-2002**

Applicant: Iospan Wireless Inc.
Re: Description of Experiment

Iospan Wireless Inc. is developing a 3.4 - 3.6 GHz non-line of site radio system for EXPORT ONLY. The system will not be sold in the United States; the intended market for the system is in the EU, Latin America, Asia, and Canada.

The experimental license is needed so that Iospan may demonstrate the efficacy of their system in a simulated wireless networking environment.

Brief Description (from Iospan website):

Iospan Wireless' MIMO-OFDM (Multiple Input, Multiple Output Orthogonal Frequency Division Multiplexing) technology uses multiple antennas to both transmit and receive radio signals. MIMO-OFDM is the only technology that will allow service providers to deploy a Broadband Wireless Access (BWA) system that has truly Non-Line-of-Sight (NLOS) functionality.

In environments with relatively low base station antennas that are not in a subscribers' CPE line-of-sight, radio signals bounce off buildings, trees and other objects as they travel between the two antennas. This bouncing effect produces multiple "echoes" or "images" of the signal, a phenomenon known as "multipath." As a result, the original signal and the individual echoes each arrive at the receiver antenna at slightly different times causing the echoes to interfere with one another thus degrading signal quality.

Iospan uses MIMO technology to turn "multipath" into an advantage for service providers and their customers. The system simultaneously transmits customer data using multiple transmit antennas located at slightly different points in space. The data is broken up into pieces and each piece is sent at the same time over the wireless channel. The receiver processes the separate data flows and puts them back together.

This spatial multiplexing technique proportionally boosts the carrying capacity or the data-transmission speed by a factor equal to the number of transmitting antennas. As an example, if two antennas are used, the data-transmission speed is doubled. Since all data is transmitted both in the same frequency band and with separate spatial signatures, this technique utilizes spectrum with extremely efficiency.

One of the most significant benefits of MIMO technology is that it enables service providers maximum return on their investment. MIMO technology makes it possible for service providers to:

- Leverage existing antenna infrastructure/towers for base station placement
- Achieve optimum system capacity and coverage
- Offer QoS guarantees necessary for competitive differentiation in the marketplace.

If service providers were to use the existing wireless infrastructure without incorporating MIMO technology, the inevitable results would be enormous reductions in both service coverage and capacity. Current broadband wireless solutions are not able to support the necessary NLOS operation in these conditions. These line-of-sight technologies also do not support frequency re-use and, therefore, are not scalable solutions.

Experimental Goal

Iospan will use two fixed stations (one called the "hub", the other called the "interferer") and a mobile CPE to simulate actual network traffic and to demonstrate the system's throughput and capacity under actual LOS (line of sight) and NLOS (non-line of sight) conditions.