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Re:	Call for contributions IEEE 80216e-02/01
Abstract	This contribution presents some notes on reference system deployment scenario and impact of the mobile environment on the current 802.16a, and answers some of the points presented in the call for contributions IEEE 80216e-02_01.
Purpose	Answering to points presented in the call for contributions
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IEEE 802.16e Mobility System Perspective

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1 General

This contribution presents some notes on reference system deployment scenario and impact of the mobile environment on the current 802.16a, and answers some of the points presented in the call for contributions [6].

2 Reference System Deployment Scenario

The reference system deployment scenario is based on the following assumptions:

Multi-cell, macro and/or micro

The service area is covered by a set of base-stations, where each base station contains at least one air-interface instance (i.e. at least one sector).
A sector should be able to cover an area ranging from a few hundreds of meters to 15 kilometers.

Omni-directional or sectored antennas or both

A sector may use either a directional or omni-directional antenna in a single multiple antenna formation.

Frequency reuse and cell-to-cell interference (FDD &TDD)

The system should be able to operate in either TDD or FDD mode. H-FDD operation of the mobile handset should be possible.
The sectors share the frequency and/or time resources of the system. In order to minimize mutual interference, base-stations are synchronized in frequency and in time (sections 8.4.5.1.1 and 8.5.10.1.1 in [2] define how this can be achieved).
Frequency reuse factors will range from 1/1 up to 1/6. See [5] for coverage simulation.

Level of Cell network interconnect and handoff

The base-stations share a common backbone connection through which they can communicate with each other.
The system should provide all the hooks required for efficient operation of mobile-IP.
All the base-stations forming the infrastructure of the mobile network comply with a certain *mobile-operation-profile* (i.e. all support IPv4 and IPv6, all support a certain set of convergence sub-layers, etc.).

Mobile Channel Effects

The channel model is based on [4] modified to support frequencies up to 6GHz.

Doppler

Doppler channels up to 250Hz will be supported (equivalent to 100Km/H at 2.7GHz).

Dispersive Multipath – Fast Fading

Rayleigh channels up to 20usec excess delay spread

3 Impact of the mobile environment on the current 802.16a

Synchronization & Timing

No changes are required in the PHY layer synchronization and timing mechanisms. The base-stations should be synchronized to minimize system self-interference. Synchronization between base-stations simplifies the handoff procedures and facilitates fast handoff capability.

Ranging

No changes are required in the PHY layer ranging mechanism.

Power Control

Due to potential fast changes in the mobile uplink channel the power-control mechanism in [2] should be enhanced to support faster changes in the channel. The efficiency of this message should be improved as well, as it will be used sparingly.

Channel Coding

No changes are required in the PHY layer coding.

Measurement methods and messaging for handoff support

See section 2.4 in [7].

Effect on Advanced Antenna Systems MAC Protocols

Not addressed.

References

[1] IEEE Std 802.16-2001 “Part 16: Air Interface for Fixed Broadband Wireless Access Systems”
[2] IEEE P802.16a/D7-2002 “Part 16: Air Interface for Fixed Broadband Wireless Access Systems – Medium Access Control Modifications and Additional Physical Layer Specifications for 2-11 GHz”
[3] IEEE C802.16-SGM-02/23 “802.16a OFDMA PHY suitability for mobile applications”
[4] RECOMMENDATION ITU-R M.1225 “GUIDELINES FOR EVALUATION OF RADIO TRANSMISSION TECHNOLOGIES FOR IMT-2000”
[5] IEEE C80216e-03_03 “OFMDA System Simulation in a Single/Multi Cell Configuration”
[6] IEEE 80216e-02_01 “Call for Contributions on Project 802.16e”
[7] IEEE C80216e-03_05 “IEEE802.16e Mobility Enhancements”