

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	Input on 802.16m Performance Requirements (Section 7.0)	
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Re:	Call For Contributions on Requirements for P802.16m – Advanced Air Interface	
Abstract	This contribution provides a set of Performance Requirements for the P802.16m Advanced Air Interface amendment, based on the initial Draft Requirements document IEEE 802.16m-07/002.	
Purpose	This document is submitted in response to the Call For Contributions on Requirements for P802.16m – Advanced Air Interface, dated 2007-01-29, issued by the 802.16 Working Group.	
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Input on Performance Requirements for 802.16m

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Abstract

This contribution provides a set of Performance Requirements for the P802.16m Advanced Air Interface amendment. These requirements address section 7.0 of the Draft Requirements document IEEE 802.16m-07/002.

Text to be Added

Insert the following text:

7.0 Performance Requirements

7.1 User Throughput

The IEEE 802.16m standard shall provide Aggregate User Throughput according to the following table:

User Type	10 MHz Channel Bandwidth	20 MHz Channel Bandwidth
Fixed User	100 Mbps	200 Mbps
Mobile User	50 Mbps	100 Mbps

Aggregate User Throughput shall be defined as the total sustained throughput (uplink + downlink), net of MAC & PHY layer overheads, across all users scheduled on the same RF channel. These throughput requirements must be supported for all distributions of users in all regions of a fully loaded cell surrounded by other fully loaded cells using the same RF channel (i.e. an interference limited environment with full frequency reuse).

The IEEE 802.16m standard shall support the required throughput with a minimum downlink efficiency of 80%, where airlink efficiency shall be defined as:

$$I - (\text{Number of downlink MAC and PHY overhead slots (Preamble, MAP, sub-MAP, FCH, etc.) per frame} / \text{Total number of downlink slots per frame})$$

The IEEE 802.16m standard shall support the required throughput with a minimum uplink efficiency of 80%, where airlink efficiency shall be defined as:

$$I - (\text{Number of uplink MAC and PHY overhead slots (ranging allocations, HARQ Ack-Nack, CQICH, etc.) per frame} / \text{Total number of uplink slots per frame})$$

7.2 Spectral Efficiency

The IEEE 802.16m standard shall provide spectral efficiency of at least 10 bps/Hz, where spectral efficiency shall be defined as:

$$\text{Aggregate User Throughput in Mbps (defined above)} / \text{Channel Bandwidth (MHz)}$$

These spectral efficiency requirements shall be supported in all regions of a fully loaded cell surrounded by other fully loaded cells using the same RF channels (i.e. an interference limited environment) assuming the following mix of user traffic:

- Fixed and nomadic (no mobility) – 70%
- Low speed mobility (up to 60 km/h) – 20%
- High speed mobility (over 60 km/h) – 10%

These spectral efficiency requirements shall be supported in a network utilizing a frequency reuse pattern of $(1, 1, s)$. Frequency reuse is indicated as (c, n, s) where c is the number of base station sites per cluster (i.e. 1), n is the number of unique RF channels needed for reuse (i.e. 1), and s is the number of base station sectors per base station site.

7.3 Mobility

The IEEE802.16m standard shall provide seamless mobility within and between all cell types in an IEEE802.16m system. The standard shall provide seamless mobility with legacy IEEE 802.16e reference systems. Handoff with other IMT-2000 standards is highly desirable.

7.4 Coverage

The IEEE 802.16m standard shall provide PHY and MAC structures that enable significant improvements in system gain through the use of multi-antenna beamforming, higher order MIMO and enhanced diversity techniques. System gain improvements shall be obtained in a fully loaded cell in an interference-limited environment regardless of user distribution within the cell.

The IEEE 802.16m standard shall provide performance of control channels (MAPs, etc.) to be equal to or better than that of bearer traffic in all areas of a cell under fully loaded conditions regardless of user distribution.

The IEEE 802.16m standard shall incorporate enhanced MAP techniques to improve MAP reliability in interference limited deployments.