Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**	
Title	**Proposed text for P802.16m Requirements Document -- Section 7**	
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Re:	IEEE 802.16m-07/004r1 – Call for Contributions for P802.16m Requirements	
Abstract	Proposed draft text for 802.16m Requirements Document -- Section 7	
Purpose	Incorporate into the draft-802.16m Requirements Document	
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Alcatel-Lucent 16m team

7.1 User throughput

Average rates
In a 20 MHz channel, the achievable average throughput, per terminal, in practical operational conditions (cellular environment, mobility effects, etc.) at typically required cell coverage, shall be at least 10 Mbps. The definition of average throughput per user terminal should be consistent with the definition and measurement specifics specified in the TGm Evaluation Criteria document (TBD).

PHY Improvements
Some improvements over the current 16e standard are required to increase performance in variable mobile user environments, mobility speeds and spectrum/bandwidth allocations. In particular, the service availability at the cell edge should be doubled (relative to "16e") for the 10-percentile of the cell-edge users. Such improvements should be accompanied by increased spectral efficiency. Example solutions include:

- Extended MCS range to support large channel loss
- Waveform adaptation depending on channel multi-path spread and Doppler
- Increase spectrum efficiency by:
    - Enhanced multiple antenna schemes including BF and MIMO.
    - Frequency and time optimised scheduling (water-filling)
    - Interference avoidance, or coordination methods, to achieve higher cell edge throughput, and more uniform service availability

Adaptability to a wide range of user speeds

- High speed need large overhead for reference symbols and signalling
- In low speed environments, higher spectrum efficiency can be achieved
    - By lowering signalling and reference symbols overhead, or increase channel estimate (including channel sounding needed in CL MIMO)
- Cognitive methods should be used to get knowledge of users characteristics, and adapt the transmission format, receiver algorithms and sounding periodicity accordingly

MAC Optimization
Further optimization of the MAC should be considered for "16m". Overhead for critical real-time, latency-sensitive applications, should be reduced as far as feasible without compromising other performance criteria. More specifically, 802.16m should support various FEC-block, MAC-PDU and other protocol layer block sizes, optimized for typical applications by minimizing padding bits, i.e., matching payload to block sizes for the key application that need to be supported (VoIP, Gaming, Video, etc).

Although backward compatible 802.16m should be able to receive the legacy DCD/UCD messages, as well as the DL and UL MAPs, other non compatible operating modes shall be supported where the overhead of the layer 2 maps is significantly reduced.

7.2 Spectrum efficiency

7.3 Mobility

For seamless mobility interoperation with other mobile wireless standards, Event, Command and Information services specified in IEEE 802.21 should be adopted by 802.16m as media-specific support. Event services in the 802.16m PHY and MAC should be supported by triggering link events when configurable thresholds are crossed, enabling the MIH (Media Independent Handover) function to react expeditiously to the changing channel conditions. Similarly, the MAC and PHY layers should be able to accept local and remote commands as specified in IEEE 802.21.

Mobility procedures should be fully compatible with the Network Control and Management Services (NCMS) procedures described in the IEEE 802.16g amendment. At a minimum, 802.16m shall support all the NCMS functional entities, described in IEEE 802.16g, which may be centrally located or distributed across the network.

7.4 Coverage

7.5 Enhanced Multicast-Broadcast