Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Scope of PAR of the Study Group on Mobile Broadband Wireless Access**
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Re:	Call for contributions towards the Working Group Study Group on Mobile Broadband Wireless Access (MBWA), IEEE 802.16-02/13r1.
Abstract	This contribution states the position of authors in regards to the scope of the new Working Group Study Group on MBWA. Specifically, this contribution proposes that the SG include a TDD air interface in the scope of the PAR of this new project.
Purpose	It is recommended that the Study Group adopt this proposal.
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Scope of PAR of the Study Group on Mobile Broadband Wireless Access

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Background

IEEE 802.16, during its last meeting held 11-15 March 2002 in St. Louis, MO, initiated a Study Group (SG) on Mobile Broadband Wireless Access (MBWA) "operating in licensed frequency bands and supporting mobility at vehicular speeds"[1]. The SG is responsible for activities leading to the authorization of a Mobile Broadband Wireless Access project within IEEE 802. In particular the SG shall:

- Develop the PAR for MBWA;
- Complete the "Five Criteria" for MBWA; and
- Make a recommendation on the placement of the project within IEEE 802"[2]

The authors, who are all members of the TDD Coalition, welcome this effort by IEEE 802 in starting a new project addressing high-speed data networks for mobility applications. Some of the TDD Coalition members, who are also members of IEEE 802.16, are also planning to attend the SG meetings held in conjunction with the next 802.16 interim meeting May 20-24 in Calgary.

In an early submission by the Chair of the new SG, a draft for PAR and 5 Criteria was proposed. These submissions limited the scope of the project to "1.25 MHz FDD channels"[3]. The authors, however, believe that the nature of the problem the new standard is going to address, i.e. high speed, mobile wireless access to data networks, and the inherent asymmetry of the data traffic that will be carried over the air interface of such systems, lends itself quite naturally to a Time Division Duplex (TDD) air interface.

Time Division Duplex Technology and Asymmetric Channels

Time Division Duplex (TDD) offers best solution for asymmetric, high data rate services and provides flexibility in deployment of networks in a variety of environments including busy urban, hotspot and busy indoor environments as well as wide area applications at low cost. TDD supports all voice and data applications, providing efficient use of spectrum for the most data-intensive services. It is the most effective air interface for asymmetric, "bursty" data applications such as Internet services. This capability is crucial as the number of wireless Internet applications and multi-media services for consumers and corporate/business users increases over the next few years. The TDD technology thus provides operators with an opportunity to deploy sufficient capacity and capability in order to increase their revenues through offering broadband data services that are inherently asymmetric.

TDD technology is being continually enhanced and supports increasingly higher data rates. This is in line with the increasingly data centric usage projected. Higher order modulations combined with fast link adaptation provides for the implementation of adaptive modulation and coding techniques that reduce the signal to noise ratio requirements and allow a more efficient data communication, in effect increasing system data transport capacity.

TDD technologies' capability to provide both time as well as code multiplexing, make them more attractive for high speed access schemes, because they allow more flexible and efficient use of physical channel resources, which allows for better integration of different types of services. This in turn provides higher capacity as well as greater spectral efficiency. In addition, the inherent reciprocity of uplink and downlink channel characteristics in TDD bands would make it more advantageous to deploy techniques such as adaptive beamforming arrays and diversity techniques that further enhance MBWA systems' ability to support higher data rate traffic.

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[1] 80216-02_14r1, Motion to establish a IEEE 802.16 Working Group Study Group on mobile broadband wireless access networks.

[2] ibid

[3] Preliminary MBWA PAR, April 2002, submitted to 802.16 by Mark Klerer, Flarion

Proposal

It is hereby proposed by the authors that the SG on MBWA include a TDD air interface in the scope of the PAR of this new project.
