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Re:	MBWA Call for Contributions
Purpose	To discuss the distinctions between fixed/nomadic and mobile wireless
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MBWA Distinct Identity

The goal of this contribution is to point out some distinctions between mobile broadband wireless access (MBWA) and fixed and nomadic wireless access systems.

First, a key differentiator is the speed at which the systems are designed to operate. According to ITU-R Recommendation M.1034-1, wireless access can be divided into the following mobility classes:

- stationary (0 km/h)
- pedestrian (up to 10 km/h)
- typical vehicular (up to 100 km/h)
- high-speed vehicular (up to 500 km/h)

By MBWA ("mobile wireless"), we refer to any systems that can address the latter two mobility classes. In contrast, the definitions of fixed and nomadic wireless access ("fixed wireless") require the user terminal to be stationary while in use. We define portability to cover only the first and second mobility classes.

In addition to distinct mobility classes, fixed wireless and mobile wireless have traditionally involved distinct sets of carriers, vendors, spectral allocations, data rates, applications, user services and devices. In particular, mobile wireless typically uses licensed spectrum below 3.5 GHz allocated for mobility, with allocations as small as a single or paired 5 MHz blocks and channel bandwidths as small as 1.25 MHz. Meanwhile, fixed wireless systems typically use unlicensed bands or licensed spectrum allocated for fixed services, with different block allocations and channel bandwidths than mobile wireless.

There are numerous system design issues for mobile wireless that may impact the PHY and MAC design. To support vehicular speeds, the system needs to be robust against rapid channel variations. Since licensed spectrum for mobility is limited, great emphasis is placed on spectral efficiency. To achieve these ends, mobile wireless systems may make use of real-time control channels, non-contention-based transmissions and messaging and efficient, low latency access schemes that scale with the number of users. In addition, synchronization, access, power control, timing control, and multiple antenna spatial processing may also be optimized for vehicular mobility. There are also significant implications of mobility on the IP layer due to the need to maintain routability of the host IP address and preserve in-flight packets during IP hand-off. This may require specialized low-latency MAC signaling resources for IP hand-off management, e.g., for movement detection, re-authentication, and hand-offs for uplink and downlink IP packets and MAC frames.

Finally, MBWA will need to work in close coordination with other standards groups focused on mobility (such as IETF, T1P1, the Partnership Projects and ITU-R). In order to facilitate joint meetings and collaboration, it will greatly ease logistical considerations to have a separate group focused on mobile wireless.

For technical, market and logistical reasons, we argue that MBWA has a significantly distinct identity from fixed, nomadic and portable wireless, and recommend that there should be a separate working group within IEEE 802 to address mobile wireless.

The table below provides a highlight of the distinctions in for MBWA and fixed wireless.

Issues	MBWA	Fixed Wireless

Channels	Licensed for mobile. Typical bandwidths of 1.25 or 5 Mhz	Unlicensed, or licensed for fixed
Design issues for PHY/MAC	Need to address fast channel variations, e.g., using control channels, non-contention-based transmission, fast power control, spatial processing for mobility	Not required for Fixed Wireless
Network layer issues	Support for higher layer mobility management, e.g., handoffs, roaming, paging	Not required for Fixed Wireless
Speed	Vehicular	Stationary / pedestrian
Applications	Mobility-oriented	Transport
Logistics	Coordination with other mobile standards groups (IETF, T1P1, Partnership Projects, ITU-R)	802.16 WG