

Discussion Draft of Pedestrian Mobility BWA “Five Criteria”

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Purpose:

SG Chair’s draft to stimulate discussion and facilitate progress toward work on separate projects on Vehicular and Pedestrian Mobility. The Pedestrian Mobility drafts are based on C802.16SGM-02/02, C802.16SGM-02/03 and C802.16SGM-02/11. The Vehicular Mobility drafts are based on C802.16SGM-02/08 and C802.16SGM-02/11.

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Early disclosure to the Working Group of patent information that might be relevant to the standard is essential to reduce the possibility for delays in the development process and increase the likelihood that the draft publication will be approved for publication. Please notify the Chair <<mailto:r.b.marks@ieee.org>> as early as possible, in written or electronic form, of any patents (granted or under application) that may cover technology that is under consideration by or has been approved by IEEE 802.16. The Chair will disclose this notification via the IEEE 802.16 web site <<http://iee802.org/16/ipr/patents/notices>>.

**Mobile Broadband Wireless
Access Systems
“Five Criteria”
Pedestrian Mobility**

Draft 0.1

June 20, 2002



Broad Market Potential

- a) **Broad sets of applicability.**
 - b) **Multiple vendors and numerous users.**
 - c) **Balanced costs**
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- **Wireless access networks have the potential to compete with copper-and fiber-based systems in terms of capacity, and they offer the advantage of not requiring the installation of buried or pole-based infrastructure. The capability of the wireless networks to easily support nomadcity and pedestrian mobility is a feature unmatched by the capabilities of wireline broadband access networks. This capability allows users untethered access to the following serivces and capabilities:**
 - **Enterprise Intranets and VLAN Services**
 - **Entertainment & Gaming**
 - **Internet and Location Services**
- **The interest in this project is attested by the participation of 45 companies in the tutorial and CFI session on mobile broadband wireless access.**
- **Given that a base station in a point-to-multipoint network can serve many user stations, the cost of the equipment can easily be spread over many users. Typically it is expected to compete with the prices of cellular phones and similar equipment while providing superior performance in terms of capacity and available bandwidth.**

Compatibility

- a) Conformance with 802 Overview and Architecture
 - b) Conformance with 802.1D (MAC Bridges) and 802.1F (VLAN Bridges)
 - c) Conformance with 802.1F and compatible managed object definitions
 - d) Identification of any variance in conformance
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- **The proposed standard will conform to the 802 Functional Requirements Document, with the possible exception of the Hamming distance.**
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Distinct Identity

- a) Substantially different from other IEEE 802 standards.
 - b) One unique solution per problem.
 - c) Easy for the document reader to select the relevant specification.
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- IEEE 802 presently has no project that supports pedestrian mobility in a macro-cell environment. The low mobility BWA standard is intended to provide for public access networks operated by a third party, where the user typically makes use of a wide-area network through an access network when mobile. It differs also from a wireless LAN, which typically is operated by a single organization over smaller distances and has less-stringent requirements for system integrity and resistance to unauthorized usage.
- The project has been socialized with the existing 802 Wireless groups. (To be done at the July/November meeting).
- It is envisioned that the standard will provide protocols sufficiently flexible to provide efficiently for a variety of services, some of which may have stringently bounded delay requirements. Hence it will not be necessary to have a multiplicity of different and incompatible versions. An effort will be made to utilize the 802.16a MAC and PHY layers or applicable elements thereof.
- It is anticipated that the document will be easily selectable by the reader.

Technical Feasibility

- a) Demonstrated system feasibility.
 - b) Proven technology, reasonable testing.
 - c) Confidence in reliability.
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- The feasibility of such systems has been demonstrated by proprietary systems covering some if not all of the capabilities intended for this standard and now going into operation in many cities worldwide.
- Mobile radio technology in centimeter-wave systems has been demonstrated in recent years in point-to-multipoint systems, as used in commercial and military environments. Many systems are now in commercial use.
- Commercial deployment of point-to-multipoint systems at centimeter-wave frequencies by carriers is evidence of proven reliability.

Economic Feasibility

- a) Known cost factors, reliable data.
 - b) Reasonable cost for performance.
 - c) Consideration of installation costs.
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- The economic feasibility of the equipment has already been demonstrated at the level of proprietary systems now going into operation and the acceptance of 802.16 by the marketplace. Addition of capabilities for nomadic and pedestrian mobility will further enhance the economic attractiveness of these systems..
- Point-to-multipoint communication is efficient in handling data, which is characterized by high peak demands but bursty requirements overall. As demonstrated in many IEEE 802 standards over the years, such shared-media systems effectively serve users whose requirements vary over time, within the constraints of the total available rate. The cost of a single base station is amortized over a large number of users.
- Installation of any wireless customer-site system is relatively simple in that no offsite cabling need be installed. In contrast, with wireline networks the plant expense to connect the customer to the network is a very substantial part of the total cost and must be incurred for the first user in a coverage area. With wireless, the expenses can be incurred as customers come on-line. The siting of base stations is a more complex issue, but since one base station supports many users, the costs involved are very nominal on a per-user basis.