Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**PAR and 5 Criteria for 802.16 mobility extension**
Date Submitted	**2002-06-27**
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Re:	MBWA Call for Contributions
Abstract	
Purpose	
Notice	This document has been prepared to assist IEEE 802.16. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.
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Patent Policy and Procedures	The contributor is familiar with the IEEE 802.16 Patent Policy and Procedures (Version 1.0) <http://ieee802.org/16/ipr/patents/policy.html>, including the statement "IEEE standards may include the known use of patent(s), including patent applications, if there is technical justification in the opinion of the standards-developing committee and provided the IEEE receives assurance from the patent holder that it will license applicants under reasonable terms and conditions for the purpose of implementing the standard." 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://ieee802.org/16/ipr/patents/notices>.

IEEE-SA Standards Board Project Authorization Request (PAR) Form

Note: For use with help hyperlinks offline, download guide.html and par2000.html into the same directory. After completing this form, please e-mail it to the NesCom Secretary.
Instructions for Downloading the PAR Form

1. Sponsor Date of Request

[ ]

2. Assigned Project Number

[P802.16d]

3. PAR Approval Date

_____

Copyright release must be submitted with appropriate signatures by FAX (1-732-562-1571)}
[...] PAR Signature Page on File {IEEE Staff to check box}

4. Project Title, Recorder and Working Group/Sponsor for this Project

Document type and title: {Place an X in only one option below}

 [X] **Standard fo**r{document stressing the verb "shall"}
 [..] **Recommended Practice fo**r{document stressing the verb "should"}
 [..] **Guide for** {document in which good practices are suggested}

Title: **[Amendment to IEEE Standard for Local and Metropolitan Area Networks–Part 16: Mobility Extension for Fixed Broadband Wireless Access Systems–Physical Layer Specifications and Medium Access Control modifications for Licensed and License-Exempt Bands within the 2-11GHz Frequency Range**

Name of Working Group (WG): **[802.16 Working Group on Broadband Wireless Acces**s]
Name of Official Reporter (usually the WG Chair) who must be an SA member as well as an IEEE/Affiliate Member: [Roger B. Marks]
IEEE-Standards Staff has verified that the Official Reporter (or Working Group Chair) is an IEEE and an IEEE-SA member: [...] (Staff to check box)
Contact Information:
Telephone [[+1 303 497 3037] FAX: [[+1 303 497 7828]
E-mail: [r.b.marks@ieee.org]
**Name of Working Group Chair (if different than Reporter): [**]
IEEE-Standards Staff has verified that the Working Group Chair is an IEEE and an IEEE-SA member: [...] (Staff to check box)
Contact Information:
Telephone] FAX:]
E-mail: []
Name of Sponsoring Society and Committee:
[Computer Society, LAN/MAN Standards Committee;
Microwave Theory and Techniques Society]
Name of Committee Sponsor Chair: [Paul Nikolich, Chair, LAN/MAN Standards Committ
IEEE-Standards Staff has verified that the Sponsor is an IEEE and an IEEE-SA member: [ ] (Staff to check box)
Contact Information:
Telephone [978 749 9999 x246] FAX: [978 749 8888]
E-mail: [p.nikolich@ieee.org].2001-11-17 IEEE 802.16-01/60r2

5. Type of Project

a. Is this an update to an existing PAR? [Yes/**NO]**

If YES, indicate PAR Number/Approval Date
If YES, is this project in ballot now? [yes/no]
[Indicate changes/rationale for revised PAR in Item #16. This should be no more than 5 lines.]

b. Choose one from the following:

[...] New Standard
[...] Revision of existing Standard {number and year} []
[X] Amendment (Supplement) to an existing standard {number and year}
[802.16-2001]
[...] Corrigenda to an existing standard {number and year} [...]

6. Life Cycle

[X]Full Use (5-year life cycle)
[...] Trial Use (2-year life cycle)

7. Balloting Information

Choose one from the following:

[X] Individual Sponsor Balloting
[...] Entity Sponsor Balloting
[...] Mixed Balloting (combination of Individual and Entity Sponsor Balloting)

Expected Date of Submission for Initial Sponsor Ballot: [November 2003]

8. Fill in Projected Completion Date for Submittal to RevCom [2004 ?]

9. Scope of Proposed Project:

To amend the 802.16 standard with the needed capabilities to support low speed mobile as well as nomadic use. The extension will need PHY and MAC changes to support low-speed roamming between FWA base-stations or their sectors, as well as new multi-media interactive applications.This amendment will keep the 802.16 uniqness, allowing in the same time high data rates and high cell sizes within 2-11GHz bands.

10. Purpose of Proposed Project:

Adding low-speed mobility to the existing 802.16 lower-frequency standard will dramatically increase the residential and business market potential, permitting to take advantage of the inherent mobility of wireless solutions, in opposition with wired broadband applications, as xDSL and Cable modem. People are most often using the mobile services in fixed, walking or low speed moving situations. This standard will fill the gap between very high speed (WLANs) and very high mobility (like UMTS) systems.

11. Intellectual Property {Answer each of the questions below}

Has the sponsor reviewed the IEEE patent policy with the group?
Are you aware of any copyrights relevant to this project?
Are you aware of any trademarks relevant to this project?
Are you aware of any registration of objects or numbers relevant to this project?

12. Are you aware of any other standards or projects with a similar scope?

[Yes]{Yes, with detailed explanation below / No}

 The ETSI BRAN HIPERMAN Project is currently focusing on licensed frequencies between 2 and 11 GHz and license-exempt frequencies in the 5.725-5.875 GHz band. No mobility is supposed.

 T1P1.4 is currently developing air interface standards for Fixed Wireless Access to the PSTN Network. The primary focus of the group is wireless access to POTS, ISDN and Fractional T1/E1 services delivered via the public circuit switched telephone network, although their charter does include packet data services. The individual user data rates currently contemplated by this group range from 8 Kb/s to 2 Mb/s.
 IEEE 802.11, ETSI HIPERLAN/2 and 802.15 address primarily short range WLAN and WPAN applications, respectively. The amendment is specifically directed towards longer-range wireless point to multipoint MAN systems that provide access to core public networks. These systems typically serve large numbers of dispersed subscribers.
 ITU-R Working Party 8F is developing air interfaces for IMT-2000 and access systems beyond IMT-2000 for both mobile and fixed applications. Nevertheless, the data rates and the time latency do not fit properly the IP applications.
 DVB-RCT (EN 301 958) is an ETSI standard for video distribution and broadband wireless access..2001-11-17 IEEE 802.16-01/60r2

13. International Harmonization

Is this standard planned for adoption by another international organization?
[Yes] {Yes/No/?? if you don't know at this time}
If Yes: Which International Organization [ITU]
International Contact Information:
Name: Dr. Jos M. Costa
Address: P.O. Box 3511, Station C, Ottawa, ON K1Y 4H7 Canada
Phone: +1 613 763 7574
FAX: +1 613 763 1225
Email: costa@nortelnetworks.com

14. Is this project intended to focus on health, safety or environmental issues?

[No] {Yes/No/?? if you don't know at this time}
If Yes: Explanation [...]

15. Proposed Coordination/Recommended Method of Coordination

Mandatory Coordination

SCC 10 (IEEE Dictionary) by **DR** {Circulation of **D**Rafts}
IEEE Staff Editorial Review by by **DR**
SCC 14 (Quantities, Units and Letter symbols) by **DR**

Coordination requested by Sponsor:

[ITU] by [DR] {circulation of **D**Raft**s/L**Iaison memb/**C**ommon memb}
[ETSI BRAN] by [DR,LI] {circulation of **D**Raft**s/L**Iaison memb/**C**ommon memb}
[.....] by [...] {circulation of **D**Raft**s/L**Iaison memb/**C**ommon memb}
[.....] by [...] {circulation of **D**Raft**s/L**Iaison memb/**C**ommon memb}

Coordination Requested by Others:

[...] {added by staff}

16. Additional Explanation Notes: {Item Number and Explanation}

5a) This PAR updates P802.16a to encompass P802.16b and should be accompanied by the withdrawal of the latter. In the process of developing P802.16a and P802.16b drafts, the documents have been integrated technically and editorially and are anticipated to draw largely overlapping ballot pools. Proceeding with separate projects is no longer beneficial.
The PAR Copyright Release and Signature Page must be submitted by FAX to 732-562-1571 before this PAR will

be sent on for NesCom and Standards Board approval.

Rationale for a Broadband Wireless Access Standard:

Meeting the Five Criteria

1. Broad Market Potential

A standard project authorized by IEEE 802 shall have a broad market potential. Specifically, it shall have the potential for:

a) Broad sets of applicability

The mobility enhancement will target the consumer and business market, allowing fast access to mobile IP applications, multi-media messaging, mobile videoconference, etc. The possible services include: games, video clips, virtual sightseeing, emergency, location based services, financial services, Telematics, telemedicine, etc. The user will have access to these services at data rates similar to those provided by 802.16a and 802.16b standards, while staying, walking or traveling with speeds up to 60km/h.
These applications will add the revenue flux that will improve the business case of FWA applications and will permit to transform a niche market into a main telecommunication segment.
This standard will create the real convergence between fixed and mobile services, by allowing connectivity for high-speed data rates in all the stationary as well as in most of the mobile situations cases.

b) Multiple vendors and numerous users

The products on the market already allow connectivity while using multiple standards (GSM, CDMA, 802.11a, 802.11b, 802.15, etc. Due to the mass-market applications for Lap-tops, PDAs, etc, we believe that the producers of those devices will add the PHY/MAC interface for portable terminals.

c) Balanced costs (LAN versus attached stations)

The production costs for portable PDA and Laptop radio interfaces should be the same as for different 802.11 interfaces.

2) Compatibility

IEEE 802 defines a family of standards. All Standards shall be in conformance with the IEEE 802.1 Architecture, Management and Interworking documents as follows: 802 Overview and Architecture, 802.1D, 802.1Q and parts of 802.1f. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with 802.

Each standard in the IEEE 802 family of standards shall include a definition of managed objects which are compatible with systems management standards.

The proposed standard will conform to the 802 Functional Requirements Document, with the possible exception of the Hamming distance.

3. Distinct Identity

Each 802 standard shall have a distinct identity. To achieve this, each authorized project shall be:

a) Substantially different from other IEEE 802 standards.

This standard will be the first IEEE 802 standard to support low speed mobility. Besides, it targets high cell sizes, as compared with 802.11 or 802.15 wireless standards.

b) One unique solution per problem (not two solutions to a problem).

The mass-market success of the standard will be possible only if a single air interface will allow both fixed and mobile use.

c) Easy for the document reader to select the relevant specification.

In order to help the document reader, is proposed to provide the standard as an amendment to 802.16 basic standard, instead of supplying an amendment to 802.16, 802.16a and 802.16b standards.

4) Technical feasibility

For a project to be authorized, it shall be able to show its technical feasibility. At a minimum, the proposed project shall show:

a) Demonstrated system feasibility

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.

b) Proven technology, reasonable testing

802.16a and 802.16b like systems are already in commercial trials.

c) Confidence in reliability

Commercial deployment of point-to-point and point-to-multipoint systems at millimeter-wave frequencies by carriers is evidence of proven reliability.

5) Economic feasibility

a) Known cost factors, reliable data

The economic feasibility of the equipment has already been demonstrated at the level of proprietary systems now going into operation. The willingness of investors to spend large sums to acquire spectrum rights, plus the large additional investment required for hardware in public networks, attests to the economic viability of the wireless access industry as a whole.

b) Reasonable cost for performance.

The use of such methods as point-to-multipoint communication provides substantial economies relative to earlier point-to-point technologies, particularly 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.

c) Consideration of installation costs.

The mobile hand-held devices, as PDAs and Laptops, do not need installation. The base stations site is a more complex issue, but since one base station supports many users, the costs involved are very nominal on a per-user basis.