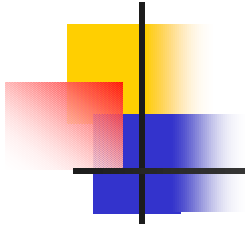| Project	**IEEE 802.20 Working Group on Mobile Broadband Wireless Access** **<http://grouper.ieee.org/groups/802/20/>**
Title	**Requirements for 802.20 Compliant Mobile Wireless Systems**
Date Submitted	**2003-05-12**
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Re:	MBWA Call for Contributions – Session # 2, May 12, 2003
Abstract	This document defines key system requirements for mobile broadband wireless access systems implementing the IEEE 802.20 standard. (Presentation version of C802.20-03/34)
Purpose	Review and adopt
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1 Purpose

This document defines key system requirements for mobile wireless systems implementing the IEEE 802.20 standard.   These requirements reflect the rapidly evolving wireless market and the growing demand for data services.

2 Scope

This document defines requirements for the operations of 802.20 compliant systems in a multi-vendor, multi-technology metropolitan area environment. This includes interoperability with other access systems with intra and inter-system hand-off support.

3 Requirements

3.1 Drivers

802.20 based systems should support the following services:
1.   High-speed and high capacity data services at rates (see Tables 1 and 2) suitable for mobile Internet applications, such as: real-time audio and video streaming of multi-media and other emerging applications.
2.   Symmetrical (Uplink/Downlink) sustained high data-rate traffic at defined QoS levels.
3.   Toll quality voice

3.2 Core Network

The 802.20 air interface should be designed to take advantage of Next Generation Network (NGN) architectures currently being defined in standards bodies and industry groups, such as existing wireless, IETF, ITU, including globally harmonized IP core network.

3.3 Information Data Rates and Capacity

802.20 is envisioned to be a high speed, high capacity spectrally efficient air interface suitable for IP connectivity. Consistent with the 802.20 PAR, the Tables 1 and 2 outline proposed data rates and capacity characteristics.
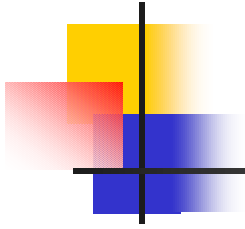
Table 1 – Information Data Rates and Capacity Requirements for 1.25 MHz channel.

Description	Downlink	Uplink
Voice Capacity	Equivalent of 52 Erlangs/Sector	Equivalent of 52 Erlangs/Sector
Outdoor Peak Data Rate[1]	3 Mbps	3 Mbps
Outdoor Average Data Rate[2]	1 Mbps/Sector	1 Mbps/Sector
Indoor Peak Data Rate[3]	3 Mbps/Sector	3 Mbps/Sector

1. "Outdoor Peak Data Rate" is defined as the maximum instantaneous information data rate available to any given user in a mobile application.
2. "Outdoor Average Data Rate" is defined as the system-wide average information data rate available per sector in a fully loaded system with all users moving at average vehicular speed.
3. "Indoor Peak Data Rate" is defined as the maximum instantaneous data rate available to any given indoor user moving at pedestrian speed.
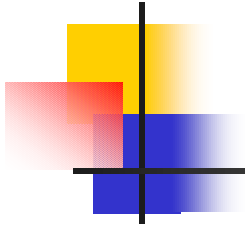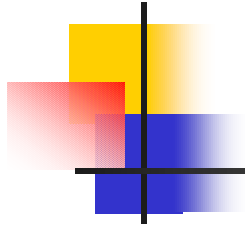
Table 2 – Information Data Rates and Capacity Requirements for 5 MHz channel.

Description	Downlink	Uplink
Voice Capacity	Equivalent of 175 Erlangs/Sector	Equivalent of 175 Erlangs/Sector
Outdoor Peak Data Rate[1]	9 Mbps	9 Mbps
Outdoor Average Data Rate[2]	3 Mbps/Sector	3 Mbps/Sector
Indoor Peak Data Rate[3]	9 Mbps/Sector	9 Mbps/Sector

1. "Outdoor Peak Data Rate" is defined as the maximum instantaneous information data rate available to any given user in a mobile application.
2. "Outdoor Average Data Rate" is defined as the system-wide average information data rate available per sector in a fully loaded system with all users moving at average vehicular speed.
3. "Indoor Peak Data Rate" is defined as the maximum instantaneous data rate available to any given indoor user moving at pedestrian speed.
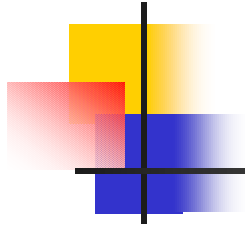
3.4   Fundamental Requirements

3.4.1   Support for multi-sector cell configurations

3.4.2   The 802.20 RF channel characteristics should be compatible with existing mobile wireless systems[1] (e.g., band classes, guard bands, interference constraints for coexistence with neighbouring RF systems.).

3.4.3   Integrated Operations, Administration and Maintenance (OA&M) capabilities for performing service configuration of end user devices

3.4.4   Integrated security framework providing for authentication, authorization, session protection, and information privacy that is comparable with existing mobile wireless systems and other relevant Standards.

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[1] For the purposes of this document, "existing mobile wireless systems," means systems based on 3GPP and 3GPP2 family of standards.
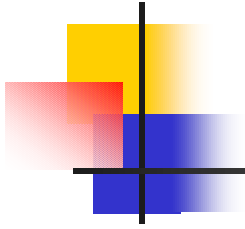
3.4.5   Integration with AAA architectures of existing mobile wireless systems

3.4.6   High-speed packet data capability along with real-time IP based voice support

3.4.7   Interoperability (including handoff) with other existing mobile wireless systems. Seamless handoff of voice over IP and other packet data services between 802.20 and existing mobile wireless systems (assuming multimode end user devices).

3.4.8   Support for multiple packet data application types that can be used to achieve the best system performance and maximize the data throughput while satisfying the Quality of Service requirements of the end user. Packet air-interface optimised for the transport of IP services including:

- Real-Time Services and High-Speed Data

- Non-Real-Time High-Speed Packet

- Broadcast and Multicast

3.4.9   An "always–on" user experience for data services

3.4.10   Provisioning for future advanced antenna technologies support for higher data rates
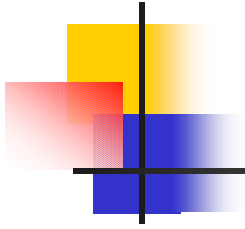
3.4.11   Over-The Air (OTA) Activation and Service protection

3.4.12   Network support for multiple concurrent packet sessions

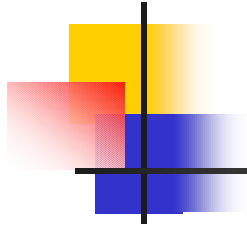3.4.13   Support for well defined range of audio and video codecs

3.4.14   Consistently "Excellent" (MOS >= 4.0) voice call quality when operated in the highest quality mode

3.4.15   Capability to develop accounting records

3.4.16   Support real-time and non-real-time services based upon the following
Quality of Service parameters:

a. Assured Data Rate

b. Latency or Delay

c. Effective data loss rate.

3.5   Radio Environment

As a minimum requirement, the coverage range for 802.20 shall align closely with existing mobile wireless systems. The objective of the coverage requirements is to ensure that operators can use existing cell/sector configurations.

Further, all standards developed must be consistent with the regulatory requirements such as those described in Part 15, Part 22, and Part 24 of the FCC Rules.