



Report ITU-R M.2116-1
(11/2010)

**Characteristics of broadband wireless
access systems operating in the land mobile
service for use in sharing studies**

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***Note:** This ITU-R Report was approved in English by the Study Group under the procedure detailed in Resolution ITU-R 1.*

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(Questions ITU-R 1/5 and ITU-R 7/5)

(2007-2010)

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1 Introduction

This Report provides characteristics for a number of terrestrial broadband wireless access (BWA)¹ systems, including mobile and nomadic applications, operating, in the mobile service for use in sharing studies between these terrestrial BWA systems and other fixed or mobile systems.

2 Characteristics

Annex 1 contains technical and operational characteristics of mobile BWA² systems to be used for sharing studies for both mobile stations and base stations. It should be recognized that the footnotes in the Table provide important information on the derivation of particular values and any limits to their applicability for sharing studies. Therefore, these footnotes should be taken into account wherever referenced.

¹ “Wireless access” and “BWA” are defined in Recommendation ITU-R F.1399.

² BWA radio interface standards can be found in Recommendation ITU-R M.1801. Radio interface standards for broadband wireless access systems, including mobile and nomadic operations, in the mobile service operating below 6 GHz.

3 IMT-2000 radio interfaces

Terrestrial IMT-2000 systems³ meet the definition of BWA found in Recommendation ITU-R F.1399. In addition to the characteristics found in Annex 1, sharing characteristics of IMT-2000 systems in the 2 GHz range can be found in Report ITU-R M.2039 – Characteristics of terrestrial IMT-2000 systems for frequency sharing/interference analyses, and are not duplicated herein. These systems should also be considered in sharing analysis involving BWA systems⁴.

Systems beyond IMT-2000 will also meet the criteria to be considered BWA, and as these systems are developed their characteristics should also be considered for sharing studies with BWA systems. Systems beyond IMT-2000 may be incorporated into future revisions of this Report directly or by reference.

4 RLAN characteristics

In addition to the characteristics found in Annex 1, characteristics of RLAN systems can be found in Recommendation ITU-R M.1450 – Characteristics of broadband radio local area networks, and are not duplicated herein.

Annex 1

Table 1 contains technical and operational characteristics for use in sharing studies in the 1-3 GHz frequency range, Tables 2a and 2b contain technical and operational characteristics for use in sharing studies for the 3.4-4.2 GHz band and Table 3 contains a list of acronyms and abbreviations.

³ IMT-2000 radio interface standards are described in Recommendation ITU-R M.1457. Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000).

⁴ Recommendation ITU-R M.1823 provides values for some systems applicable to BWA.



TABLE 1

Technical and operational characteristics for use in sharing studies in the 1-3 GHz frequency range

Parameter	IEEE 802.16 ⁽¹⁾		HC-SDMA ⁽²⁾		XGP ⁽³⁾		T1.716/717 ⁽⁴⁾		ATIS.0700001.2004 ⁽⁵⁾		T1.723 ⁽⁶⁾		SCDMA BWA ⁽⁷⁾	
	BS	MS	BS	MS	BS	MS	BS	MS	BS	MS	BS	MS	BS	MS
System														
Nominal channel BW (MHz)	5 {1a}		0.625 {1b}		10 {1c}		2 × 5 to 2 × 20 MHz (in 3.5 or 5 MHz increments)		5		1.25		5	
Modulation type	QPSK, 16-QAM, 64-QAM	QPSK, 16-QAM, 64-QAM	BPSK, QPSK, 8-PSK, 12-QAM, 16-QAM, 24-QAM	BPSK, QPSK, 8-PSK, 12-QAM, 16-QAM	BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM	BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM	QPSK	QPSK	QPSK, 8-PSK, 64-QAM	QPSK, 8-PSK, 16-QAM	QPSK	BPSK, QPSK	QPSK, 8-PSK, 16-QAM, 64-QAM	QPSK, 8-PSK, 16-QAM, 64-QAM
Duplex method	TDD/FDD		TDD		TDD		FDD		TDD		FDD		TDD	
Access technique	TDMA/OFDMA		TDMA/FDMA/SDMA		TDMA/OFDMA		CDMA		CDMA		CDMA		CS-OFDMA	
No. of sectors	3 {3a}	Not applicable	3 {3b}	Not applicable	1 or more	Not applicable	Typically 3	Not applicable	Typically 3	Not applicable	Typically 3	Not applicable	Typically 3	Not applicable
Reuse factor	1:1, 1:3		1:1 {4a}		1:1		1:1, 1:3		1:1 {4a}		1:1		1:1	
Antennas per sector	Not specified		12 {5a}	1	4 or more	1 or more	Not specified	Not specified	Not specified	1	Not specified	1	1 or more typically 8	1 or more
Co-located antenna minimum coupling loss (dB) {6}	30	Not applicable	30	Not applicable	30	Not applicable	30	Not applicable	30	Not applicable	30	Not applicable	30	Not applicable
Antenna gain (dBi)	18 {10a}	0 to 6 {10a}	15	0	12 or more	0 to 4	18 {10a}	0 to 6 {10a}	18 {10a}	0 to 6 {10a}	17 {10a}	0 to 6 {10a}	17 {10a}	0 to 6 {10a}
Antenna height AGL (m)	15 to 30 {11}	≤ 1.5	15 to 45	≤ 1.5	15 to 45	≤ 1.5	15 to 30 {11}	≤ 1.5	15 to 30 {11}	≤ 1.5	15 to 30	≤ 1.5	15 to 30 {11}	≤ 1.5
Radiation pattern	Horizontal {7c} Vertical {7d}	Not specified	Adaptive {7b}	Omni-directional {7a}	Omni-directional {7a}	Omni-directional {7a}	Not specified	Not specified	Not specified	Not specified	Not specified	Not specified	Typically vertical	Typically vertical

TABLE 1 (*continued*)

Parameter	IEEE 802.16 ⁽¹⁾		HC-SDMA ⁽²⁾		XGP ⁽³⁾		T1.716/717 ⁽⁴⁾		ATIS.0700001.2004 ⁽⁵⁾		T1.723 ⁽⁶⁾		SCDMA BWA ⁽⁷⁾	
	BS	MS	BS	MS	BS	MS	BS	MS	BS	MS	BS	MS	BS	MS
Transmitter														
Average power (dBm)	36 {8a}	20 {8a}	24.2 {8b}	20	40 {8a}	23 {8a}	36	20	24.2 {8b}	20	43	26	33 {8b}	23
TDD activity factor (dB) {9}	3		−1.76 {9a}	−4.77 {9b}	3		Not applicable		Variable 0 to −4.77		Not applicable		Variable −8.45 to 8.45	
Antenna gain (dBi)	18 {10a}	0 to 6 {10a}	15	0	12 or more	0 to 4	18 {10a}	0 to 6 {10a}	18 {10a}	0 to 6 {10a}	17 {10a}	0 to 6 {10a}	17 {10a}	0 to 6 {10a}
Antenna height AGL (m)	15 to 30 {11a}	≤ 1.5	15 to 45	≤ 1.5	15 to 45	1.5	15 to 30 {11b}	≤ 1.5	15 to 30 {11b}	≤ 1.5	15 to 30	≤ 1.5	15 to 30	≤ 1.5
Misc. losses (dB)	2 {12a}	0	1 {12b}	0	2 {12b}	0	2 {12b}	0	2 {12b}	0	< 2 {12b}	0	< 1	0
Adjacent Channel Leakage Ratio (ACLR) (dB)	{13a}		{13b}		{13d}		{13e}		{13e}		{13f}		{13e}	
ACLR_1 (dB)	53.5	33	53.5 {13c}	33	40	23	40 {13c}	33	40 {13c}	33	40 {13c}	33	40 {13c}	33
ACLR_2 (dB)	66	43	66 {13c}	43	60	33	50 {13c}	43	50 {13c}	43	50 {13c}	43	50 {13c}	43
Receiver														
Antenna gain (dBi)	18 {10a}	0 to 6 {10a}	15	0	12 or more	0 to 4	18 {10a}	0 to 6 {10a}	18	From 0 to 6 {10a}	17	0 to 6	17	0 to 6
Antenna height (AGL) (m)	15 to 30 {11a}	≤ 1.5	15 to 45	≤ 1.5	15 to 45	1.5	15 to 30 {11b}	≤ 1.5	15 to 30	≤ 1.5	15 to 30	≤ 1.5	15 to 30	≤ 1.5
Misc. losses (dB)	0 {12a}	0	1 {12b}	0	2 {12b}	0	0 {12a}	0	0 {12a}	0	0 {12a}	0	< 1	0
Noise figure (dB)	3	5	5	7	5	7	4	7	4	7	4	7	4	6
Thermal noise density (dBm/Hz)	−174		−174		−174		−174		−174		−174		−174	
Adjacent Channel Selectivity (ACS) (dB)	{14a}				{14b}									
ACS_1 (dB)	46	33	46	33	42	30	46	33	46	33	46	33	46	33
ACS_2 (dB)	56	47	46	43	42	30	56	43	56	43	56	43	56	43