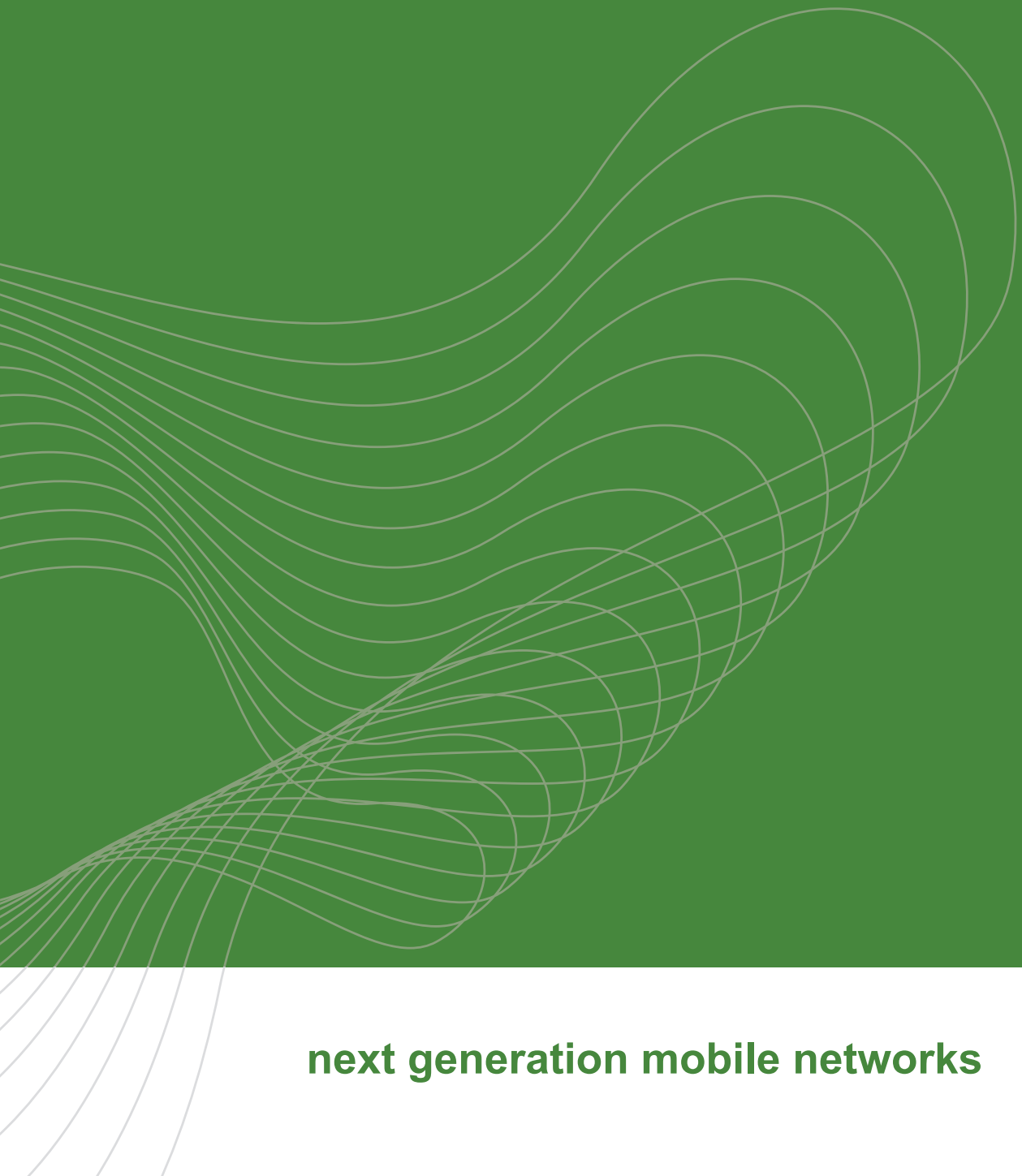
ngmn
the engine of broadband wireless innovation

A White Paper Update by the NGMN Alliance

NGMN Spectrum Requirements Update



next generation mobile networks

A White Paper Update by
the NGMN Alliance

Next Generation Mobile Networks Spectrum Requirements Update

Release Date: February 11th, 2009

Document Information

Editor in Charge	Michael Krämer (KPN / E-Plus)
Editing Team	NGMN Spectrum Working Group
Document status:	Approved
Version:	1.1
Date:	February 11th, 2009

Abstract

Spectrum is the life blood of the mobile industry. But unfortunately spectrum is a limited and scarce resource that requires careful global, regional and national planning and regulation. The timely availability of sufficient and suitable spectrum for mobile communications is a prerequisite to extending the benefits of mobile broadband to all people, and to furthering the global success story of mobile communications.

To continue to offer benefits to the users and societies, the mobile communication industry requires continued availability of radio spectrum in sufficient quantity within suitable bands and arranged in a consistent and harmonised manner. This will facilitate global roaming and enable economies of scale that produce high cost efficiencies.

In 2007, the ITU World Radiocommunications Conference (WRC-07) has identified additional spectrum for International Mobile Telecommunications (IMT-2000 and IMT-Advanced):

- 20 MHz in the band 450 – 470 MHz (globally)
- 72 MHz in the band 790-862 MHz for Region 1 (Europe) and parts of Region 3 (Asia)
- 108 MHz in the band 698 – 806 MHz for Region 2 (Americas) and some countries in Region 3 (Asia)
- 100 MHz in the band 2,300 – 2,400 MHz (globally)
- 200 MHz in the band 3,400 – 3,600 MHz (no global allocation, but identified in 82 countries)

As a next step, the ITU-R is currently developing channelling arrangements for these bands so that they can subsequently be used on a harmonised basis around the world. NGMN members are actively participating in the ongoing ITU-R work to ensure that the new arrangements will suit the NGMN needs. The current status and NGMN views on these bands are provided below. NGMN is continuing to study these bands and may develop additional views in the future.

450-470 MHz

So far, the proposed channelling arrangements are FDD. NGMN did not include this band in the list of initial bands to be supported by NGMN terminal devices. Taking into account the current usages of this band, an FDD arrangement would generally be an option in alignment with existing usage.

698-806 MHz

The consensus achieved by the International Telecommunication Union at the World Radiocommunication Conference (WRC-07) in Geneva is an important step towards closing the digital divide. The WRC-07 identified 108 MHz of UHF spectrum for this purpose and China, India and Japan are among the countries that supported this identification advanced by Region 2 administrations.

This band allows mobile operators to provide a cost-effective, continuous, broadband experience, targeting for expanded rural coverage and better quality coverage in urban areas. Some countries in Region 3, such as China, India and Japan have supported identification of spectrum for IMT in the 698 – 806 MHz band, while other countries in Region 3 have supported IMT identification from 790 to 862 MHz. Introducing additional mixed band plans combining parts of CEPT and US plan would lead to equipment and roaming disadvantages, and therefore lose the merits of globally harmonized spectrum.

In March 2008, United States took further steps in implementation of its band plan for 698-806 MHz and equipment vendors have already started the work taking advantage of this resource in the provision of wireless broadband. The US band plan is unlikely to change and has an advantage of early deployment of mobile broadband networks as major service providers in the US have announced the deployment of LTE by 2009-2010 timeframe, and it forms the basis of a regional 700 MHz band plan proposal, shown in Figure 1.

Figure 1 – Proposed Region 2 700 MHz band plan

The schedule of Region 3 administrations in implementing the digital dividend varies widely and extends to 2015.

790-862 MHz

Within CEPT the channelling arrangement is currently being developed under a mandate from the European Commission. NGMN supports an FDD arrangement of 2 x 30 MHz, with reversed duplex direction (the mobile transmits at 832-862 MHz) and a duplex gap of at least 10MHz.

2,300-2,400 MHz

An unpaired TDD arrangement seems to be the most capable plan for delivering high bit-rates and therefore NGMN supports TDD in this band.

3,400-3,600 MHz

Both CEPT and ITU are developing channelling arrangements for this band. NGMN supports the allocation of all the blocks in a neutral manner, FDD or TDD alone in alignment with current regulation. Moreover NGMN supports a band plan which would allow an extension to 3,800 MHz and possibly up to 4,200 MHz for use in countries where terrestrial use is permitted.