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Nota di contenuto	About the Series Editors -- Preface -- 1 Introduction (Bernhard H. Walke and Hitoshi Yoshino) -- 1.1 Trends in Mobile Communication -- 1.1.1 Mobile applications and services -- 1.1.2 Radio interface technologies -- 1.1.3 Standardization -- 1.2 Trends in Spectrum Usage -- 1.2.1 Physical properties of radio spectra -- 1.2.2 Spectrum allocation and identification -- 1.3 Spectrum Allocation: Why and How -- 2 Utilization of Radio Frequencies (Hitoshi Yoshino, Naoto Matoba, Pekka Ojanen and Bernhard H. Walke) -- 2.1 Spectrum Usage Overview -- 2.2 Spectrum Management by ITU -- 2.3 Radio Communication Services -- 2.4 Radio Communication Systems -- 3 Spectrum Requirement Calculation for IMT-2000 (Hideaki Takagi) -- 3.1 Model -- 3.2 Input Parameters -- 3.3 Methodology -- 3.4 Sequel to the Story -- 4 Spectrum Requirement Calculation for IMT-Advanced (Marja Matinmikko, J<U+008a> org Huschke, Tim Irnich,

Naoto Matoba, Jussi Ojala, Pekka Ojanen, Hideaki Takagi, Bernhard H. Walke and Hitoshi Yoshino) -- 4.1 Overview -- 4.2 Models and Input Parameters -- 4.3 Methodology -- 4.4 Summary of Methodology for IMT-Advanced -- 5 Calculation Tool Package (Marja Matinmikko, J. Huschke and Jussi Ojala) -- 5.1 Description and Use of Software Tool -- 5.2 Front Sheet of Software Tool -- 5.3 Inputs to Software Tool -- 5.4 Intermediate Calculation Steps -- 5.5 Outputs from Software Tool -- 6 Market Data (Marja Matinmikko and Mitsuhiro Azuma) -- 6.1 Collection of Market Data -- 6.2 Use of Market Parameters in the Methodology -- 6.3 Analysis of Collected Market Data -- 6.4 Example Input Market Parameter Value Set -- 7 Radio-Related Input Parameters (Marja Matinmikko, Pekka Ojanen and Jussi Ojala) -- 7.1 RAT Group Approach -- 7.2 Use of Radio Parameters in the Methodology -- 7.3 Example Input Radio Parameter Value Set -- 8 Numerical Examples (Tim Irnich, Marja Matinmikko, Jussi Ojala and Bernhard H. Walke) -- 8.1 Packet Size Statistics and QoS Requirements -- 8.2 Traffic Demand Derived from Market Data -- 8.3 Traffic Distribution Ratios. 8.4 Offered Traffic per RAT Group and Radio Environment -- 8.5 Required System Capacity -- 8.6 Required Spectrum -- 9 Capacity Dimensioning to Meet Delay Percentile Requirements (Tim Irnich and Bernhard H. Walke) -- 9.1 Delay Percentile Evaluation -- 9.2 Service Time Distribution in IP-Based Communication Systems -- 9.3 Waiting Time Distribution in M/G/1 Queues -- 9.4 Delay DF Approximation -- 9.5 Accuracy of Gamma and H2 Approximations -- 9.6 Impact of Percentile Requirements on System Capacity -- 9.7 Conclusion -- 10 Epilog: Result of WRC-07 (Hitoshi Yoshino) -- Appendices -- Appendix A Derivation of Formulas by Queueing Theory (Hideaki Takagi) -- A.1 Erlang-B Formula for a Loss System -- A.2 Erlang-C Formula for a Delay System -- A.3 Multidimensional Erlang-B Formula -- A.3.1 Two classes of calls with single server occupation -- A.3.2 Several classes of calls with multiple server occupation -- A.4 M/G/1 Nonpreemptive Priority Queue -- Appendix B Example Market Study Parameter Values -- Appendix C List of Acronyms and Symbols -- C.1 Acronyms -- C.2 Symbols -- Appendix D ITU-R Documents and Web Sites -- D.1 ITU-R Recommendations -- D.2 ITU-R Reports -- D.3 Other ITU-R Documents -- D.4 Web Sites -- Bibliography -- Index.

Sommario/riassunto

Presents the model and methodology, applied by ITU-R WRC'07, to calculate the spectrum requirement for IMT-Advanced Systems, i.e. the next generation wireless communication systems. Spectrum requirement Planning in Wireless Communications: Model and Methodology for IMT-Advanced is a self-contained "handbook" of the models and methodologies used for the spectrum requirement calculating for IMT-Advanced systems, as well as for the predecessor IMT-2000 systems. The reader will learn how the spectrum requirement is calculated for real systems that prevail worldwide. The book also provides the basis on which to develop advanced methodologies for forthcoming systems, as the spectrum regulation will continue in the future. Key Features: . Provides the reader with information on how the spectrum requirement is calculated for real systems that prevail worldwide . Contains useful tables and examples, such as a flowchart of the methodology . Introduces definitions of service category and radio environment, the process of distributing traffic to radio environments, and the method to calculate the required spectrum . Applies queueing and loss models for the calculation of required system capacity . Explains how to use the calculation tool package . Provides a link to a website with the downloadable tool applied by ITU-R WRC'07 for making decisions on spectrum regulation for mobile

systems. This book serves as an invaluable guide to engineers in mobile phone companies, system design engineers, operator system engineers and other specialists dealing with mobile system planning and development. It is also of great interest to researchers and graduate students in the fields of applied probability theory, operations research, telecommunications, and mobile networks engineering.
