



Recommendation ITU-R P.2109-1
(08/2019)

Prediction of building entry loss

P Series
Radiowave propagation



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Foreword

The role of the Radiocommunication Sector is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services, and carry out studies without limit of frequency range on the basis of which Recommendations are adopted.

The regulatory and policy functions of the Radiocommunication Sector are performed by World and Regional Radiocommunication Conferences and Radiocommunication Assemblies supported by Study Groups.

Policy on Intellectual Property Right (IPR)

ITU-R policy on IPR is described in the Common Patent Policy for ITU-T/ITU-R/ISO/IEC referenced in Resolution ITU-R 1. Forms to be used for the submission of patent statements and licensing declarations by patent holders are available from <http://www.itu.int/ITU-R/go/patents/en> where the Guidelines for Implementation of the Common Patent Policy for ITU-T/ITU-R/ISO/IEC and the ITU-R patent information database can also be found.

Series of ITU-R Recommendations

(Also available online at <http://www.itu.int/publ/R-REC/en>)

Series	Title
BO	Satellite delivery
BR	Recording for production, archival and play-out; film for television
BS	Broadcasting service (sound)
BT	Broadcasting service (television)
F	Fixed service
M	Mobile, radiodetermination, amateur and related satellite services
P	Radiowave propagation
RA	Radio astronomy
RS	Remote sensing systems
S	Fixed-satellite service
SA	Space applications and meteorology
SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
SM	Spectrum management
SNG	Satellite news gathering
TF	Time signals and frequency standards emissions
V	Vocabulary and related subjects

Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.

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Prediction of building entry loss

(2017-2019)

Scope

This Recommendation provides a method for estimating building entry loss at frequencies between about 80 MHz and 100 GHz for probabilities of $0.0 < P < 1.0$. The method is not site-specific, and is primarily intended for use in sharing and compatibility studies.

Keywords

Building, indoor, propagation, interference, entry

The ITU Radiocommunication Assembly,

considering

- a) that, for system planning and interference assessment it may be necessary to account for the attenuation suffered by radio waves in passing into, or out of, buildings;
- b) that there is a need to give guidance to engineers to estimate coverage or predict interference from outdoor to indoor and indoor to outdoor systems,

recognizing

- a) that Recommendation ITU-R P.2040 provides guidance on the effect of building materials and structures on radio waves;
- b) that Report ITU-R P.2346 contains collated empirical data on building entry loss,

recommends

that the model in Annex 1 should be used to estimate building entry loss.

NOTE – Sharing studies carried out by ITU-R on different agenda items of WRC-19 were based on the text of this Recommendation which was in force at the time of these activities or at the time which the activity was carried out.

Annex 1**1 Introduction**

This Annex provides a model for building entry loss (BEL) as defined in Recommendation ITU-R P.2040. The output of the model is in the form of a cumulative distribution function of the probability that a given loss will not be exceeded.

The model makes no attempt to separate the loss suffered by a signal penetrating the exterior wall and the attenuation suffered in the path through the building. This approach has been adopted as it is felt unlikely that, in the context of ITU-R studies, sufficiently detailed building-specific information would be available.