inter.noise 2010
noise and sustainability
13-16 June 2010 . Lisbon . Portugal
www.internoise2010.org

NEW AUDIO-VISUAL APPROACH FOR ENVIRONMENTAL NOISE ASSESSMENT

L. Maffei[1], S. Iachini[2], M. Di Gabriele[1], S. Basturk[1], G. Ruggiero[2]

[1] Built Environment Control Laboratory, Second University of Naples, Aversa (CE), 81031, Italy luigi.maffei@unina2.it
[2] Laboratory of Cognitive Science and Immersive Virtual Reality, Second University of Naples, Caserta (CE), 81100, Italy, santa.iachini@unina2.it

Abstract
The END 2002/49/CE identifies noise maps as one of possible action to avoid, prevent or reduce the harmful effects due to exposure to environmental noise. Nevertheless, several international studies, carried out in urban open spaces, have shown that below some values of noise levels the acoustic comfort of people doesn't depend only on energetic levels, but rather by multi-perceptual factors. Recent developments in virtual reality technology and audio rendering techniques allow us to experiment new approaches for environmental noise assessment which evaluate noise annoyance. In the present study the acoustic impact of a project of a new motorway has been evaluated according to the audio-visual approach with help of immersive and non-immersive virtual reality applications and compared with traditional noise predictive method based on noise maps and noise limits.

Keywords: Environmental noise assessment, audio-visual perception, virtual reality, soundscape

1 Introduction

Presently, according to EU and national legislations, energetic levels of noise and defined limits for various land usage influence the actions taken against effects of environmental noise [1]. These actions, targeting reduction in measured or predicted noise levels, are not always feasible and cost-effective and also do not match always with people's expectations. To comply with these limitations, the soundscape approach purposes a comprehensive evaluation of the sound environment which is more directly related with people's perceived acoustic comfort. Recent studies on soundscape show that the process of assessment includes both objective parameters of the sonic environment and subjective parameters.