

Annoyance due to noise and vibrations from railway traffic in cities

Résumé :

Vibrations due to rail vehicles (e.g. tramway, train) propagate from the tracks to inside neighbour houses. These vibrations can be detected by people but they can also make some panels to move, thus creating noise. In the case of surface transportation these phenomena are associated with the vehicle pass-by noise. This co-exposition to noise and vibration is a source of annoyance, as well as of some health issues.

Few studies have been conducted to investigate this co-exposition in terms of annoyance. They use indices which only describe an amount of energy for each separate exposition. Results can be contradictory. These contradictions could be due to differences in the level or frequency content in the noise or vibration signals used in the experiments. The state of the art shows that more investigations are needed to get a better understanding of this co-exposition. Experiments should be conducted in laboratory as well as *in situ* in order to bring to light all perceptual phenomena related to annoyance.

The goal of the thesis is to improve the knowledge of the perceptual phenomena involved in a combined noise and vibration exposure. Intensity evaluation will be studied, as intensity is well-known to have a key influence on annoyance. As an example, is loudness modified by a simultaneous vibration stimulus? What about the reverse interaction?