Roughness is one of the most influential characteristics of pavements in terms of road safety (others include texture, slip resistance and optical properties). It is essential to be able to measure roughness because it may affect not only the lifetime of a road bed but also driving safety and comfort.

- discomfort for occupants;

Roughness analysis has always been one of the chief R&D lines of our acoustic analysis area at Euroconsult. Ever since the IRI (International Roughness Index) was adopted as an essential parameter for highway and airport conservation we have helped to assess and standardise the index and made proposals for improvements in road bed construction methods. We have also taken part in national and international level measurement repeatability and reproducibility testing. Every year we take part in comparative testing of roughness measuring equipment organised by the General Directorate for Highways of the Ministry of Infrastructures.

Roughness can be defined as the set of effects caused in vehicles by differences between the theoretical and actual profiles for each project. It is important to analyse surface roughness because it can cause vibration and movement in cars, resulting in:

- wear on mechanical parts;
- dynamic loads on pavements that shorten their useful lifetimes;
- rolling drag that increases fuel consumption;
- problems of vehicle control and slip resistance;

The IRI

The International Roughness Index (IRI) is the most widely used method for measuring pavement roughness. It uses a measurement length of 100 m, though in special cases other lengths or even other indicators such as the 3-metre rule or spectral analysis may be of use in obtaining an understanding of certain road surface pathologies.

The IRI measures the number of irregularities found, using a quarter-car vehicle math model with a simulated vehicle speed of 80 km per hour on a mathematically adjusted road profile.