AIT AUSTRIAN INSTITUTE OF TECHNOLOGY

The AIT Austrian Institute of Technology is Austria's largest research and technology organisation. With its seven Centers, the AIT regards itself as a highly specialised research and development partner for industry, and its researchers are tackling the key infrastructural challenges of the future: Energy, Health & Bioresources, Digital Safety & Security, Vision, Automation & Control, Transport Technologies, Technology Experience and Innovation Systems & Policy.

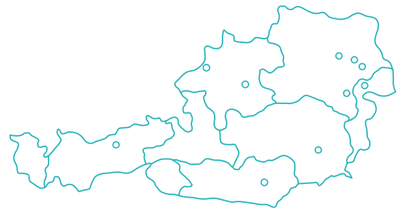
CENTER FOR TRANSPORT TECHNOLOGIES

Mobility is a core pillar of human society and therefore a central factor in our economic system. At the AIT Center for Transport Technologies, around 200 experts are working on solutions for sustainable, safe, intelligent and thus future-proof mobility. The focus of the research and development work is on material-based lightweight design, on the electrification of the propulsion train and the storage of electrical energy, as well as on a resilient and safe transport infrastructure. This also includes environmentally compatible and intelligent production technologies for mobility components. Comprehensive system know-how, scientific excellence, state-of-the-art laboratory infrastructure and many years of international experience enable AIT experts to drive innovations in the field of climate-friendly mobility and thus to serve industry and society already today with the solutions of tomorrow.

MORE ABOUT QUIET:

https://www.ait.ac.at/en/quiet

AUSTRIAN INSTITUTE OF TECHNOLOGY



1.400 EMPLOYEES

10 LOCATIONS

7 CENTERS

AUSTRIA'S LARGEST RESEARCH AND TECHNOLOGY ORGANISATION

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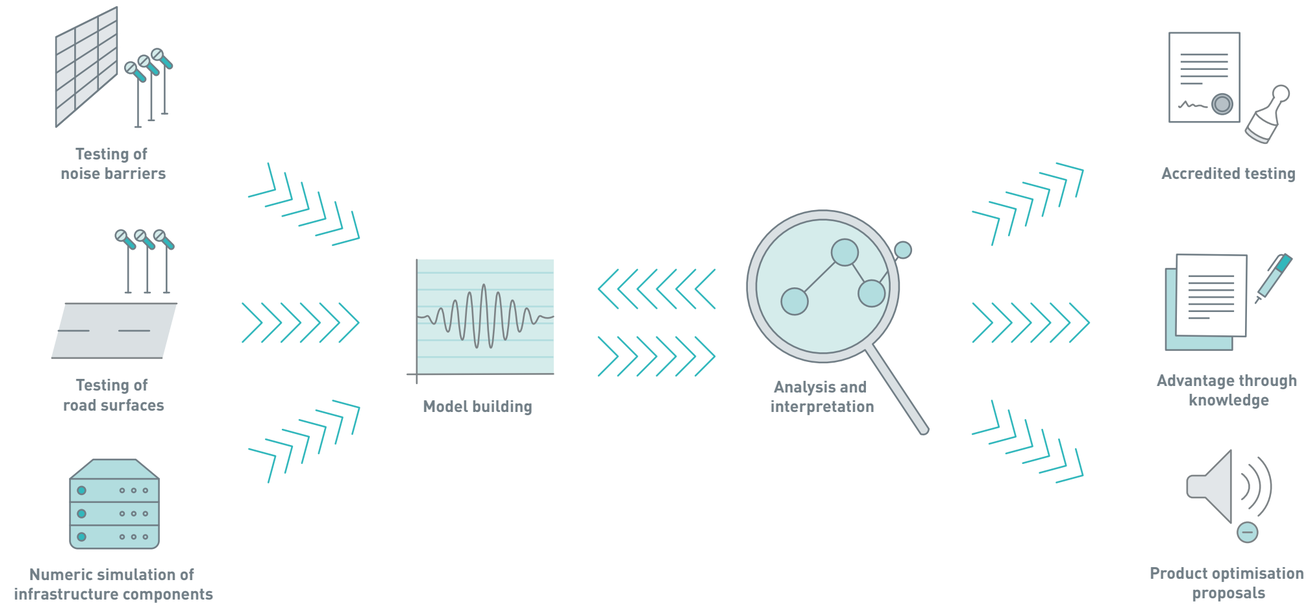
QUIET

Acoustics and noise abatement in the transport sector

QUIET: NOISE ABATEMENT FOR THE TRANSPORT INFRASTRUCTURE OF TOMORROW

For QUIET, our acoustic experts carry out precise sound measurements in the transport sector in order to numerically map and analyse noise emissions. Acoustic solutions and efficient noise abatement measures are developed together with infrastructure operators and manufacturers of infrastructure components.



THE FOCUS OF QUIET: OPTIMISATION AND TESTING OF NOISE BARRIERS

In order to understand the physical mechanisms of sound propagation in the immediate vicinity of noise barriers, we measure the acoustic properties on site. In addition, measurements are also carried out on our test bed. We validate and optimise noise barriers with the help of computer-aided models and sound field simulations.

THE FOCUS OF QUIET: ACOUSTIC PROPERTIES OF ROAD SURFACES

For speeds above 50 km/h, tyre-road noise is the dominant noise source in road traffic. That is why we pay particular attention to this aspect and to the interaction between tyres and road surface. Using a measurement trailer, we evaluate tyre-road noise in moving traffic based on the CPX method and analyse the impact of the road surface on noise emission. This is achieved by means of simultaneous and accurate 3D road surface texture measurements.

ACCREDITED TESTING – A CENTRAL ELEMENT OF OUR SERVICE PORTFOLIO

As an accredited testing laboratory, the AIT is available to conduct precise measurements in the areas of noise protection, environmental noise and sound power. Depending on the application, we carry out these tests on site and within our laboratory infrastructure. Similarly, expert assessments for noise protection are prepared in accordance with §31a of the Railway Act.

NOISE EMISSIONS ARE A BURDEN ON THE POPULATION

Traffic is often the reason why people, particularly in urban areas or on main roads, are subjected to noise pollution. Transport infrastructure operators are therefore obliged to proactively provide a low-noise transport system. The scientific staff at the AIT have been researching noise-generating mechanisms for years and possess the required expertise to provide the support needed.

QUIET TELLS YOU WHERE AND HOW TO REDUCE NOISE

We use the results from our high-precision measurements, simulations, and models to identify weak points in your infrastructure and help you with planning and implementing noise abatement measures, with the production and optimisation of infrastructure components, and with the development of new technologies such as low-noise road surfaces and innovative noise barrier systems.

People perceive noise subjectively and assess it emotionally. With QUIET, we apply methods from technical acoustics as well as psychoacoustics: using binaural measurement and aurally accurate playback technology, we conduct meaningful listening tests.

QUIET, APPLIED

- Measurement and acoustic analysis of noise barriers with regard to performance and long-term behaviour
- Optimisation of the acoustic properties of noise barriers using computer simulations, e.g. BEM, FEM, and raytracing
- Tyre-road noise and pass-by measurements for acoustic characterisation of road surfaces
- Simultaneous capturing and coupled modelling of road surface and tyre-road noise with a 3D surface texture scanner
- Analysis of the acoustic ageing behaviour of road surfaces

Rail transport: In cooperation with urban infrastructure operators, we develop algorithms for network-wide condition assessment and hotspot detection of noise and vibration emissions.