

Infrastructure – Prevention Is Better than Cure

Helmholtz Association and KIT Start the Innovation Hub “Prevention in Construction” /
Industry, Administration, and Science Want to Extend Lifecycles of Roads and Buildings



Prevention may help bridges and roads remain economically efficient and fit for their tasks in the long term. (Photo: M. Breig/KIT)

Motorways, sewer systems, energy supply, bridges – these technical infrastructure facilities in Germany are the backbone of the country’s industrial activities. Their maintenance is a big challenge for society, in particular in view of climate change, scarcer resources, and globalization. Instead of expensive repairs, more prevention might be the key to keep the infrastructure facilities fit. The Helmholtz Association and KIT have now launched the innovation hub “Prevention in Construction” to pool competencies and to develop appropriate technologies. The hub is scheduled for a duration of five years and has a budget of EUR 1.82 million.

“The hub will bring together actors along the complete chain of innovations and values added,” Professor Thomas Hirth, Vice President for Innovation and International Affairs of KIT, says. “Building owners, authorities, construction companies, and scientists together will identify development needs and develop technologies to maturity.”

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“The hub will provide access to KIT’s research installations, which are the only facilities of this kind worldwide to study this topic. Hence, big economic opportunities are opened up for the parties involved,” Professor Andreas Gerdes, coordinator of the KIT innovation hub “Prevention in Construction” and Head of the “Mineral Interfaces” Group of KIT’s Institute of Functional Interfaces, emphasizes. “Prevention in construction still is a rather insufficiently developed research area in spite of its high relevance to society. Here, enterprises can open up new markets and achieve advantages in international competition. But also for the federation, state, and municipalities, this hub represents a big chance to clear the present investment backlog.”

Prevention means that the risk of early material and building failure is reduced drastically by combining selected technical means and services along the lifecycle of a building. The costs of prevention, however, can only be justified by a lifecycle analysis that still is hardly used today. In contrast to this, pure construction costs are the basis of today’s calls for tenders. On the other hand, suitable prevention measures based on scientific engineering know-how are still lacking. Compared to repairs, costs and environmental impacts of prevention measures amount to about 10% only, as is shown by the concrete impregnation of Bavarian motorways, for example.

Long-term maintenance and future-oriented extension of technical infrastructure facilities, such as water, power, gas, and district heating lines or roads and bridges, are of central importance. Increasing failures of technical infrastructure systems show that there is a big need for action. The enormous innovation pressure in the construction sector, however, is opposed by strong traditionalism, a high density of regulations, and specific innovation obstacles of the branch that is dominated by small and medium-sized enterprises. In addition, building owners tend to optimize construction costs of a building in the short term rather than its lifecycle costs that consider construction, management, maintenance, and prevention in the long term.

To solve this problem, KIT will bring together actors of all levels in the innovation hub “Prevention in Construction”: Manufacturers of materials and products, building planners, building companies, building owners as well as authorities and standardization bodies. Together, need-oriented, structured innovation processes are to be established and research and development needs will be identified. This will lead to the development of innovative products, technologies, and services. The expertise developed will be made available directly to decision-makers of politics and society. In addition, the findings are

planned to be incorporated in the education and training of staff and, thus, in industry and administration processes.

The KIT innovation hub “Prevention in Construction” was selected for implementation together with six other so-called Helmholtz Innovation Labs (HIL) by the Helmholtz Association. These Helmholtz Innovation Labs are to strengthen the interface between industrial and non-university research. Mutual exchange is to increasingly push transfer of research findings to application. For the setup and establishment of the innovation labs, the Helmholtz Association will make available about 12 million euros in the next five years. The HILs are financed from the Initiative and Networking Fund of the Helmholtz Association and from funds of the Helmholtz Centers and companies involved. The Helmholtz Innovation Labs are supposed to extend beyond the types of know-how transfer practiced so far and to create new impetus.

Karlsruhe Institute of Technology (KIT) pools its three core tasks of research, higher education, and innovation in a mission. With about 9,300 employees and 25,000 students, KIT is one of the big institutions of research and higher education in natural sciences and engineering in Europe.

KIT – The Research University in the Helmholtz Association

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