Urban Research at KIT: A Contribution to Sustainable Urban Development

More than half of the world’s population is currently living in urban areas and this proportion is increasing continuously. In the 21st century, cities are challenged by globalization, increasing complexity and interlinkage of infrastructures, scarcity of resources, environmental pollution, climate change, and demographic change.

Research at KIT contributes to the investigation, development, and design of the city of the future in all essential aspects. With a unique combination of expertise in natural sciences, engineering, social sciences, humanities as well as planning and design, KIT researchers investigate at functional and the level of a city using a holistic approach.

KIT provides knowledge for sustainable urban development to stakeholders and policy makers on a local, regional, national, and international level.

KIT researchers have identified six challenges for urban areas, to the solution of which contributions are made.

**AMBITION**
- Integrated urban governance: Combine perspectives of different stakeholders
- Holistic and interdisciplinary scenarios for districts, cities and regions

**KIT APPROACH**
- Technology assessment and systems analysis: Embedding technologies in a social context
- Analysis of governance structures and mechanisms
- Sustainability analysis and assessment
- Development of eligible operational strategies
- Moderation of participation processes
- New cooperation and financing models

**URBAN SYSTEM**
- Analyze: finance and control

**PLAN and DESIGN**
- the city

**URBAN RESEARCH**
- at KIT

**RESOURCES**
- Efficient and sustainable use

**QUALITY of LIFE**
- Assess, preserve and enhance

**-INFRASTRUCTURES**
- Developing and connecting

**RISKS**
- Strengthen the city in handling

**AMBIENT**
- Measuring and improving the quality of life
- Better understanding of ecologic, economic and social complexity and dynamics
- Protection against hazardous environmental pollution
- Investigating urban ecology and assessing ecosystem services
- Measuring, modeling and analysing environmental pollution (air quality, water quality and soil quality)
- Determination of well-being and desirability
- Investigating demographic change, migration and multi-locality

**AMBIENT**
- Efficient urban material and energy flows
- Resource-efficient buildings
- Integrated Water Resources Management

**KIT APPROACH**
- Modeling, simulation, monitoring, balance study and analysis of material and energy flow
- Integral concepts for resource efficiency in urban areas and usage of renewable energies in buildings
- Development of efficient building materials
- Building Lifecycle Management
- Integrated urban water management

**APPLICATIONS**
- “Smart City” - Scutizing, crosslinking and improving infrastructures
- Adaptive infrastructures

**KIT APPROACH**
- Forensic disaster analysis: Natural hazards affecting technical infrastructures and societal structures
- Development of technologies for disaster prevention, reduction and management
- Risk analysis of critical infrastructures
- Investigation of regional climate change
- Analysis and development of adaptation strategies, resilience and vulnerability observation
- Monitoring, simulation, regulation and optimization of infrastructures
- Mobility systems analysis and development
- Travel behavior analysis and traffic simulation
- Smart Grids, Smart Home, Smart Traffic, Smart Data
- Electricity, gas, and ICT networks and security

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