The University of Wollongong is a leader in applied infrastructure policy, planning and delivery. UOW’s SMART Infrastructure Facility is one of the largest research institutions in the world dedicated to helping governments and businesses better plan for the future. SMART’s work is augmented by collaborations with experts across UOW’s Faculties in infrastructure-related fields such as energy generation and storage, water sustainability, environmental engineering, spatial geotechnics and social planning.

When the $62 million SMART building opened in 2011 as Australia’s first multi-disciplinary applied infrastructure research and training facility, it represented a commitment by the Australian and NSW Governments to apply a more scientific approach to infrastructure planning.

Since opening, SMART has built an international profile working with government agencies in Australia and around the world, and has developed a strong network of global collaborators. SMART brings together experts from fields such as rail, infrastructure systems, transport, water, energy, economics and modelling and simulation and provides 3D state-of-the-art laboratories to facilitate this important research. It has developed the SMART Infrastructure Dashboard (SID) to provide visual, graphical and geospatial data analysis capabilities using publicly available infrastructure utility data and relevant regional, state and national-level demographic and economic data.

The Facility provides specialist teaching laboratories for 200 post graduate research students and over 5000 undergraduate students per week.

SMART Infrastructure Facility Chief Executive Officer Garry Bowditch, who is one of Australia’s leading infrastructure experts, says SMART contributes to infrastructure planning in Australia through truly independent research coupled with deep academic rigour to ensure policymakers and industry receive high quality and timely advice on major projects.

SMART Research Director Professor Pascal Perez leads the dedicated team of researchers who tackle infrastructure issues from an integrated and multi-disciplinary perspective, with a focus on how infrastructure and social behaviour intersect to ensure more liveable cities and regions.

SMART Advisory Council Chairman Dr Ken Henry AC, former Secretary of the Australian Treasury and one of Australia’s most respected financial experts, heads a high-level advisory council that includes leaders of industry and finance, professional planners, former government infrastructure regulators and heads of government agencies.
GLOBAL CONNECTIONS

UOW’s Infrastructure researchers at SMART and in the Faculties are involved in key international partnerships and collaborations addressing some of the big challenges in infrastructure, while SMART also has an international network of Honorary and Visiting Professors.

SMART is a founding member of the International Symposium for Next Generation Infrastructure with University College London, the University of Oxford, Delft University of Technology and Virginia Tech, and hosted the group’s first international conference in 2013.

In 2014 SMART researchers working with the Jakarta Emergency Management Agency launched a big data project that uses Twitter tweets to map seasonal flooding in the Indonesian capital. The agency has worked directly with SMART engineers and geographic information systems experts to develop tools to assist authorities to deal more effectively with flood emergencies.

SMART LABORATORIES

The SMART Infrastructure Facility consists of 30 state-of-the-art research laboratories. Many of SMART’s laboratories and research facilities are also open to outside researchers from industry, academia and other national laboratories. SMART is also a member of the ICA-OSGeo Labs network – an international collaboration between the International Cartographic Association (ICA) and Open Source Geospatial Foundation (OSGeo).

SMART RESEARCH GROUPS

SMART is undertaking research that applies international experience, operational know-how, simulation, modelling and analysis.

SMART has a dedicated Economic and Governance Unit focused on providing world class, practical and actionable advice on infrastructure policy, assessment methodological and good practice. The unit offers strategic advice and applied research and services in three key areas – infrastructure economics appraisal; governance and institutional context of infrastructure; and finance.

The SMART Rail Logistics Group was established with NSW RailCorp funding of $10 million, to facilitate better rail infrastructure planning and management. It is building models for rail service providers that enhance understanding and appreciation of freight and passenger customer behaviour. The Rail Logistics research focus covers systems considerations in asset investment; education and training for rail professionals; improving customer service; constraint modelling to enhance rail capacity; and sensormatics.

The Computational Intelligence for Optimal Decision and Operation Group draws from experience in operations research and data mining to improve or combine existing methods and to develop new solutions for computational intelligence applied to infrastructure management, logistics and supply chains.

The Geo-social Intelligence for Urban Resilience and Liveability Group uses methods from ethnography and quantitative sociology mixed with social informatics (mobile technology and social media) to better understand and model social responses to policy or infrastructure changes.

The Social Simulation for Demographic Analysis and Transitions Group focuses on three complementary aspects of social simulation: creating and evolving accurate synthetic populations; developing realistic activity models for synthetic individuals and households; and integrating these active synthetic elements into spatially explicit agent-based models.

The Computer Simulation for Sustainable Transport Systems Group aims to enhance understanding of capacity and robustness of transport networks by examining elements systems such as road/rail/air traffic, design and operation.

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