PIM Project at UNSW Australia - Precinct Information Modelling Cooperative Research Centre for Low Carbon Living (CRC LCL)

The aim of this research is to ensure the veracity and reliability of all the information that informs decision-making throughout the lifecycle stewardship of the built and natural environment, specifically in the pursuit of low carbon living. The term “precinct information modelling” (PIM) describes a work program that will develop the most effective semantic structure for a precinct-level integrated digital information platform. PIM has the richness of current BIM (building information modelling) technology, but will manage the vast scale and complexity of precinct data required to support the development of software tools associated with the design and management of buildings and urban infrastructure, including the handling of real-time data streams for precinct monitoring. The PIM project will harness current Internet technologies like cloud computing and open standards to achieve a robust shared platform that integrates BIM with GIS (geographic information systems).

In short, the PIM project is about defining a common information platform capable of managing the entire information needs of all CRC project activities in order to deliver accurate, timely, consistent and relevant information that informs human decision-making, whether that is a householder trying to understand the carbon impact of their decisions, a utility or other urban infrastructure provider endeavouring to optimise their operations to reduce carbon impact, a product manufacturer managing the carbon efficiency of their product within a building context or an urban planner/designer wishing to measure projected carbon costs during precinct planning. Other CRC projects will address those specific scenarios, while the PIM project ensures that the information that informs all those activities is both accessible and reliable.

The core objective of the PIM work program is to develop a schematic definition of the types of objects required to model precincts in a more robust manner, the hierarchy of those type definitions and the relationship definitions required to holistically capture the meaning behind objects within their context. That precinct model schema needs to be both comprehensive and open so that it not only supports current assessment analysis and processes, but also allows for the development of more accurate methodologies in the future. More significantly, it must support the free flow of information between assessment tools and across stages in the planning, design, delivery and management of precincts. That requires that it be in an open, standard format that can hold information at an appropriate level of granularity to support the different processes. At the master planning stage, the kind of course level of analysis currently employed may prove to be sufficient (though there needs to be greater consistency across the indicators used that could impact on data definitions), but as precinct designs are refined and ultimately realised, the amount of information and its detail will increase, allowing more accurate performance assessments that can be checked against targets set during master planning.

This PIM work program involves: establishing an object database server technology to act as the platform for our research and development; beginning to develop and test some of the basic schema extensions and processes that will be needed to implement an urban-scale IFC schema to deepen our technical knowledge in that space (achieved through 2-3 exemplar precinct models); maintaining a close alignment with the IFC technical development team and gaining a deeper technical understanding of current GIS technology, particularly the suite of ESRI tools.