Applying system of systems methodology to transport systems

A framework to link transport stakeholders with the delivery process.

SMART Infrastructure Facility is assisting in the development of a framework capable of describing and linking all key transport enterprise stakeholder concerns and involvements in the transportation project delivery process. The initial model is for the Heavy Rail sector, with the ultimate goal being to generalise the model to cover all modes of public transport.

The need for such a model-based systems engineering approach and toolset is becoming increasingly urgent across multiple sectors in order to understand and work with all the interdependencies that exist between the components comprising modern transport systems. Experience has also shown that access to such a model, rather than a document-based system, leads to deeper understanding of the systems and a greater ability to discover errors.

The use of an architecture framework-type model provides a powerful structure for managing the engineering and behavioural aspects of large complex transport systems. At the top level, many stakeholders and their expectations are modelled and presented to them in views specific to each user’s needs so that the interdependencies can be managed in a timely manner.

Importantly, the architecture framework is designed to be readily adaptable to a range of applications within the transport sector, for example in addressing the impact of introducing new technologies in rail operations to human behaviours.

At the lowest level, the hundreds of thousands of standards, design documents and requirements specifications which are required can all be placed in a common database and linked to all the applicable nodes and viewpoints in the model. This provides users with a common underlying information base, and an easy-to-use graphical interface to navigate to the views of the information they need.

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