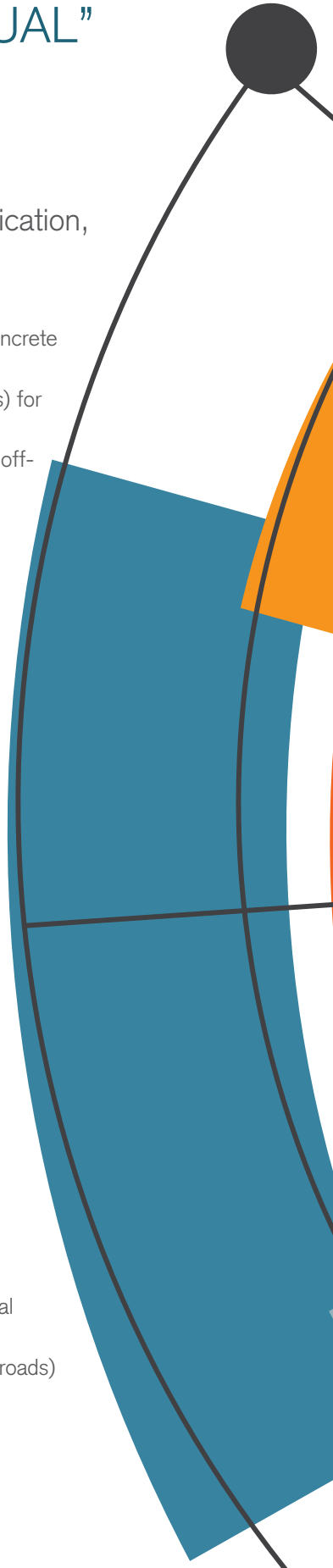
SmartCrete CRC

Outcomes of SmartCrete CRC Industry meets Academia Workshops

November 2018

A CHALLENGE TO "BUSINESS AS USUAL"



Engineered Solutions

Accelerated Innovation Pathways

Provision of innovation pathways to accelerate improvement in cost, application, durability and performance of concrete.

Program Concepts:

- Step change performance improvements in FRC and High-Performance Concrete over current concrete to enable new construction methodologies and lower costs
- Development of accelerated innovation pathways (e.g. quality assurance, performance guarantees) for concrete via an integrated Australian Standards methodology to facilitate industry innovation
- Development of Advanced self-compacting slabs to support new construction methodologies and off-site manufacturing.

Example Research Projects:

- New formula FRC and High-Performance Concrete. Fast track Australian Standards Modifications
- New formula Self-compacting slabs
- Advanced modular structures development.

Asset Management

Intelligent Assets

The use of big data to cost effectively evaluate, monitor and manage infrastructure and the urban environment.

Program Concepts:

- Development of a standardised bank of robust asset management evaluation criteria to facilitate significant project life cycle improvements
- Predictive asset management via AI and Big Data via linear monitoring and sensing of urban infrastructure (e.g. transport, utilities, infrastructure)
- Substantial reduction in the cost and durability of sensing and monitoring equipment to enable large scale proactive asset management
- Development of integrated systems and process to enable substantial disruptive transport (e.g. road, rail) productivity improvements.

Example Research Projects:

- Short and long-term monitoring of structures
- Standardised predictive modelling of project lifecycle
- Embedded sensors to monitor buildings during commissioning phase and loading phase -(e.g. Opal Tower)
- Embedded sensing and monitoring of infrastructure over lifetime - (e.g. sewerage pipes, bridges, roads)
- Automated Compliance Quality monitoring on-site of precast elements
- Faciliation modelling for integrated transport data management.

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Sustainability, Environmental and Disposal

Supply chain sustainability

Provision of innovative manufacturing methods and alternative material in a quality, cost effective, sustainable supply chain.

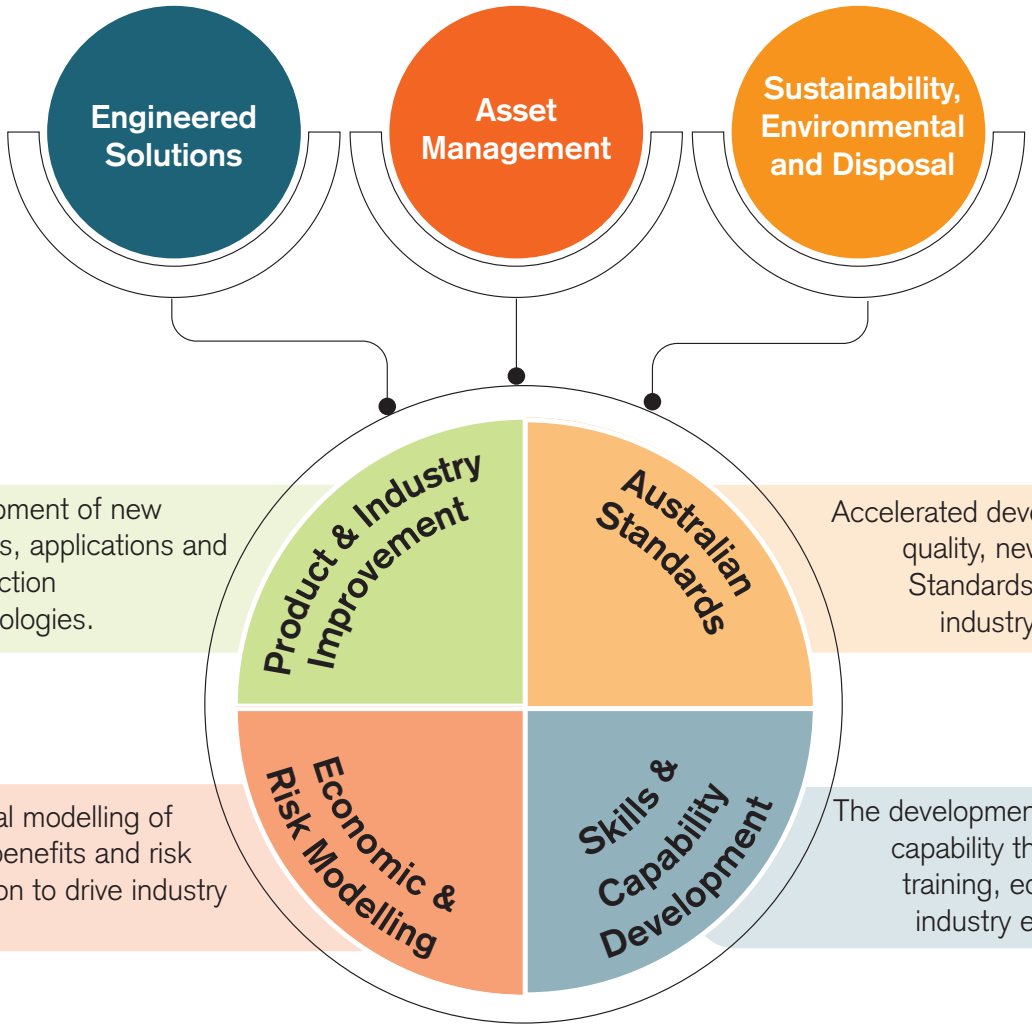
Program Concepts:

- Documentation and quantification of the sustainability of the concrete supply chain to future proof the industry.
- Development of viable alternative materials (e.g. cement, aggregates, sand) based on quality, cost effectiveness, process engineering and sustainable supply.
- Exploration and commercialisation of new material supply sources from the existing urban waste stream.
- Development of alternative manufacturing and construction methodologies to substantially reduce transport and site costs.
- Accelerated adoption of recycled concrete via the development of differential concrete formulations for low performance environments (e.g. Bikeways).

Example Research Projects:

- Financial modelling of supply chain logistics.
- Replacing dwindling resources (e.g. fly ash and beach sand)
- Use of sustainable alternative materials (e.g. glass, plastics, rubber, synthetic aggregates)
- Reducing supply chain, transport and site costs.
- Reformulation of low cost, low performance concrete.

OUR CHANGE ENABLERS



Development of new products, applications and construction methodologies.

Accelerated development of quality, new Australian Standards to advance industry innovation.

Financial modelling of cost / benefits and risk mitigation to drive industry uptake.

The development of industry capability through skills, training, education and industry engagement.