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Transport Research and Innovation Board

Transport Infrastructure Theme

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Introduction to TRIB

- TRIB, founded in March 2018, is a national board that brings together funders and leaders in transport research and innovation.
- Aim: to provide coordination to the UK transport research and innovation community, to let it work together to drive activity and investment, making UK transport R&I strategic, impactful and world-leading.
- TRIB's objectives are to:
  - **Join-up leaders**: identify priority areas; areas with most promise; and where to focus efforts.
  - **Join-up activities**: co-ordinate activities to meet these strategic needs.
  - **Leverage funding**: enable the funding of larger-scale projects.
  - **Facilitate demonstrators**: accelerate ideas and test them in practice to bring them to market sooner.
  - **Engage globally**: seize an advantage in the rapidly evolving transport technology sector.
  - **Create a line of sight to Government priorities**: understand the priorities of the SoS of DfT and BEIS.
- TRIB is chaired by David Prout, Pro-Vice Chancellor of Oxford University.
- TRIB Board Members are the Chief Executives or similar from a wide range of organisations, including from government, academia, research councils, and infrastructure operating/managing companies.

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TRIB Themes

TRIB theme	Subject	Theme champion
Transport Infrastructure	Smart, Digital, Robotic & Offsite Construction and Maintenance	Lord Robert Mair, University of Cambridge Mark Thurston, HS2 Ltd
Transport Integration	Hubs and Multi-Modal Nodes	Neil Gibson, ADEPT
Health, Wellbeing & Inclusivity	Integrated health impact transport models	Jennifer Rubin, ESRC
Transport Data	Ownership, Sharing, Interoperability, Cyber Security	Amanda Rowlatt, DfT
Transport Decarbonisation	Electrification, battery technology, hydrogen, alternative fuels	Phil Blythe, DfT

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TRIB Infrastructure Working Group (WG)

- DfT has the largest infrastructure budget across all UK government departments and, along with its ALBs, manages substantial projects including Crossrail, HS2 and Smart Motorways.
- The TRIB Infrastructure WG includes representatives from many organisations represented at TRIB, but also others with an interest in this area including, Heathrow Airport, TfL and IPA.
- Comprises two previously defined areas: (i) Infrastructure Construction and Maintenance, and (ii) Smart and Digital Infrastructure.
- Scope:
  - ✓ *The WG should focus its efforts on **smart infrastructure** ("what to build"), ("how to build more efficiently/economically"), through use of smart materials or embedded sensors; and on **smart management of infrastructure** ("how to use it").*
  - ✓ *Focus will be on driving improvements in productivity, cost and quality through standardising asset data, modular design approaches and construction methodologies and gaining more insight about the assets through life, and using data to extend the life of current assets.*
- There are very many civil engineering and construction sector initiatives that will be taken into consideration including i3P; Project 13; TIES; Construction Innovation Hub and others.

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TRIB Infrastructure WG - Project

- Two secondees from Highways England and Network Rail are working under the project management of the TRIB Secretariat to deliver the following (see Table).
- The findings for this work will be presented to the TRIB Meeting in February 2020.

TRIB Objective	Strand	Plans
• Join up Leaders • Join up Activities	Standards, Design and Data	The seconded team has been commissioned by the working group with: **1. Creating a catalogue of standards and references in use for all aspects of bridge building and maintenance to inform future activities.** **2. Identifying potential KPIs for successful innovation in transport infrastructure (bridge) build and maintenance.**
• Leverage Funding • Facilitate Demonstrators	ISCF Living Lab Demonstrator	The seconded team has been commissioned by the working group with: 3. Assessing the Transport Infrastructure Living Lab Outline Business Case (led by TIES), and making recommendations for enhancements.

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TRIB Infrastructure WG - Project

Creating a catalogue of standards and references in use for all aspects of bridge building and maintenance to inform future activities.

Joanne Geddes

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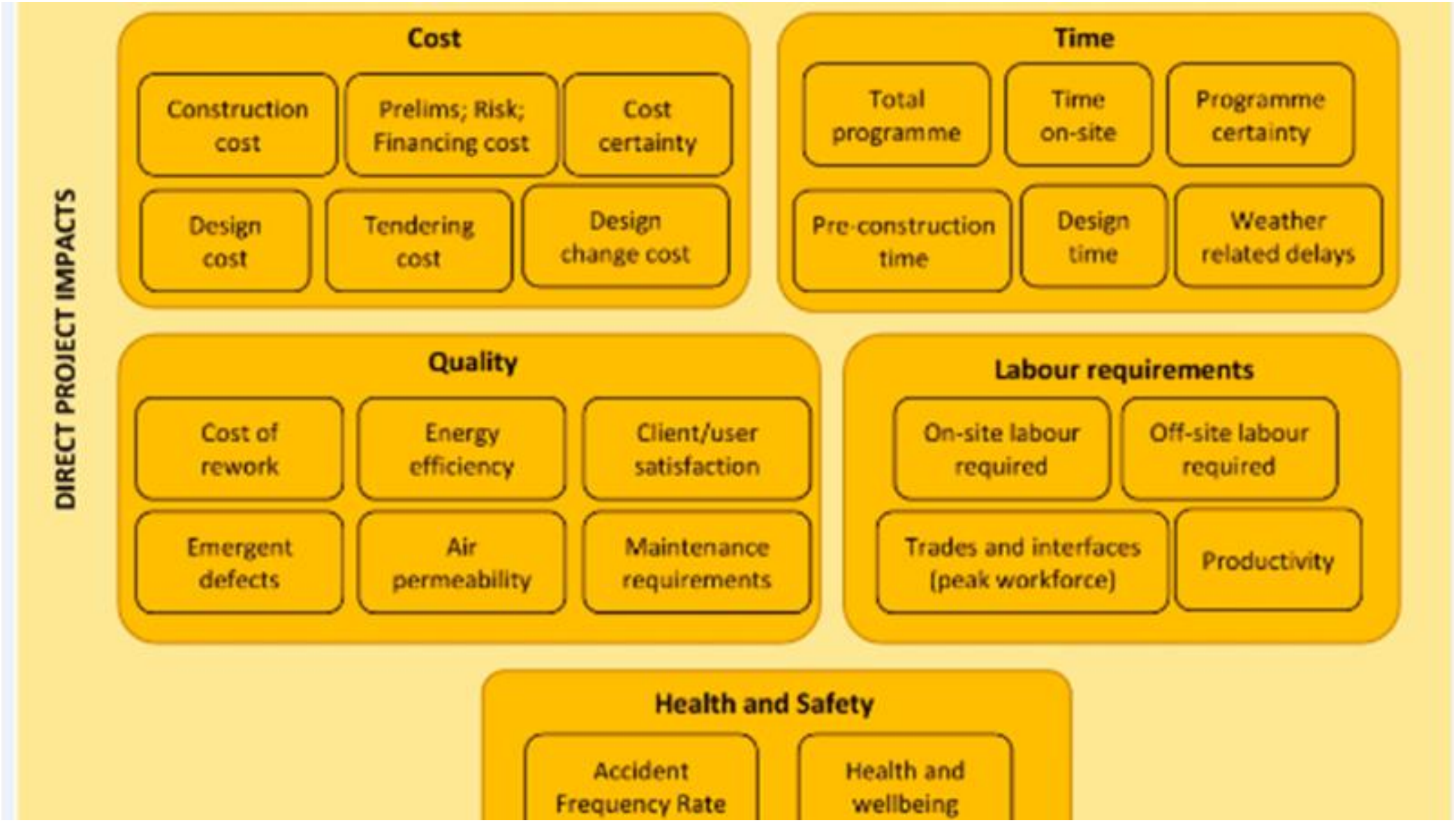
Measuring success and impact to enable comparisons



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Measuring success and impact to enable comparisons

	Metric	Unit	Definition	Notes
COST	Construction cost	£/m²	Construction cost of building works	Costs associated with the building work to be reported: Group elements 1 to 5 of RICS New Rules of Measurement. Exclude facilitating works and external works to reduce impact of site-specific constraints on result.
	Associated construction costs	%	Main contractor's preliminaries	Costs of main contractor's preliminaries, as reported in RICS group element 9, shown as percentage of construction cost.
		%	Risk (Contingencies)	Amount included for contingencies as noted in the RICS group element 13 should be reported, as a percentage of the total construction cost. Clearly state whether this refers to provisions made for contingencies or actual expenditure on the project.
		%	Financing costs	Amount of money paid by the contractor to secure financing for the project (usually interest payments), as percentage of construction cost. For example, interest on capital employed.
	Cost certainty	%	Expressed as percentage deviation from predicted cost: Final construction cost less predicted construction cost at contract award, divided by predicted cost.	Cost estimate at end of RIBA Stage 4 'Detailed Design' to be used as predicted construction cost. The predicted cost should be adjusted to include approved variations in cost due to client changes. Positive deviation shows that the costs were more than predicted and vice versa.
	Design cost	£/m²	Design team fees from concept to completion of detail design stage	
	Design change	£/m²	Cost of executing changes to the	This does not include cost of rectifying errors such as

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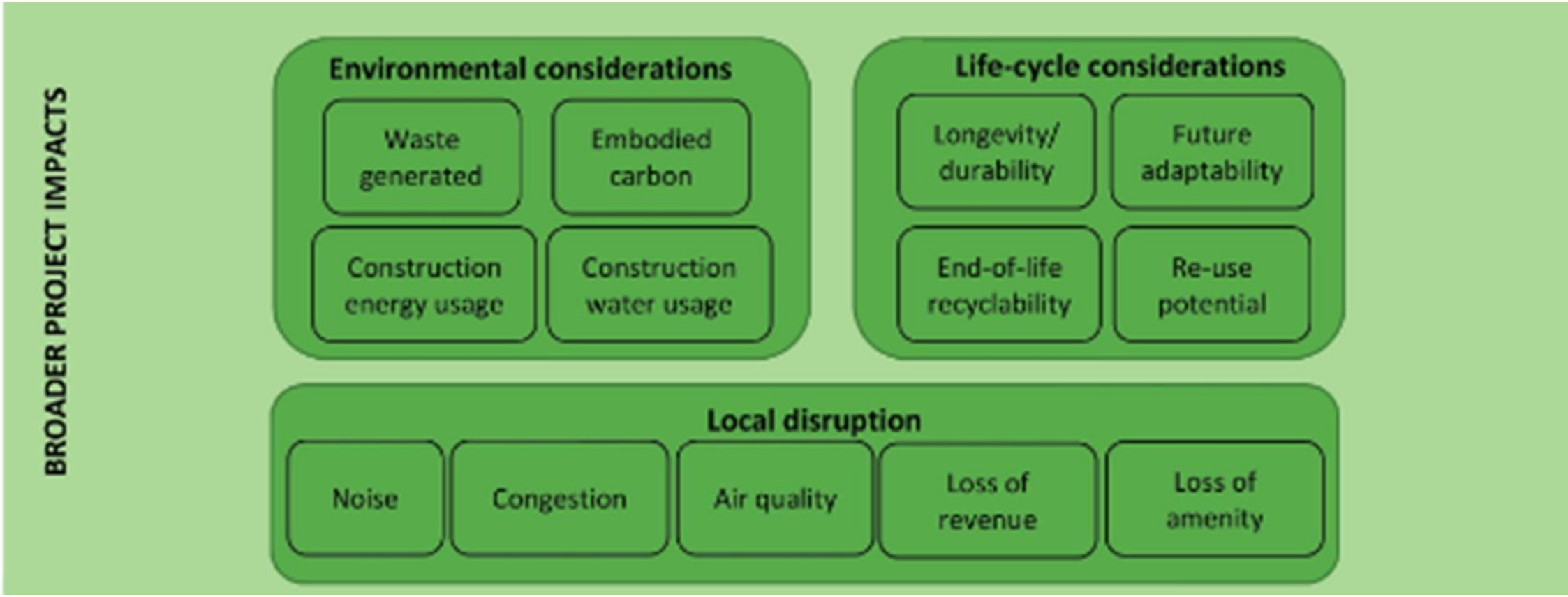
Measuring success and impact to enable comparisons



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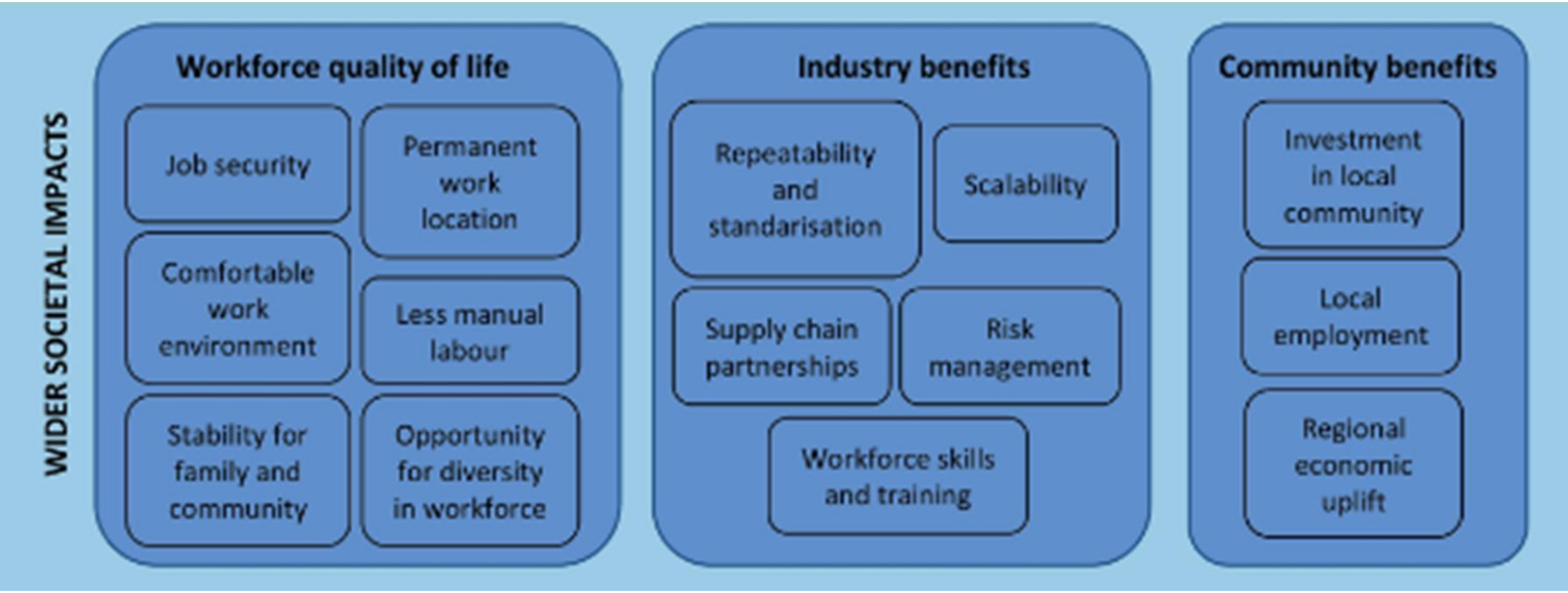
Measuring success and impact to enable comparisons



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Measuring success and impact to enable comparisons

Proposed amendments to the CIRIA model:

- Distinguish generic components / asset specific components (Bridges)
- Consider how the model could be used across the full lifecycle of the asset

Measuring success and impact to enable comparisons

Acknowledgements:

'Quantifying the benefits of off-site construction'

Prepared by the Laing O'Rourke Centre, University of Cambridge for CIRIA
Launch date: January/February 2020.

Measuring success and impact to enable comparisons

How do you evaluate a bridge project and compare it to what has happened in projects before?

TRIB Infrastructure WG - Project

Identifying potential KPIs for successful innovation in transport infrastructure (bridge) build and maintenance

Anastasios Andrianopoulos

Identifying KPIs for successful innovation in transport infrastructure

Aim

Create a catalogue of standards and references in use for all aspects of bridge building and maintenance to inform future activities

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Identifying KPIs for successful innovation in transport infrastructure

Targets and Goals Construction Strategy 2025

Lower costs

33%

reduction in the initial cost of construction and the whole life cost of built assets

Faster delivery

50%

reduction in the overall time, from inception to completion, for newbuild and refurbished assets

Lower emissions

50%

reduction in greenhouse gas emissions in the built environment

Improvement in exports

50%

reduction in the trade gap between total exports and total imports for construction products and materials

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Identifying KPIs for successful innovation in transport infrastructure

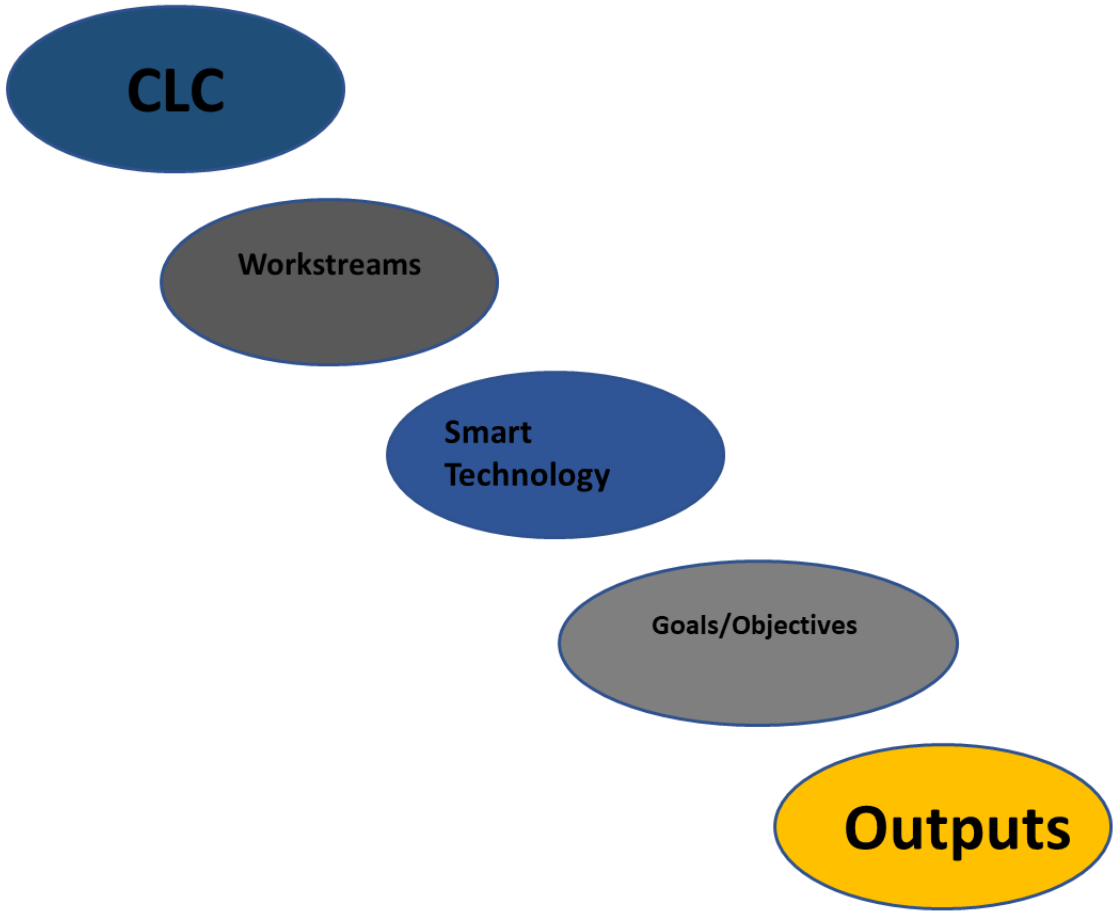
Industry boards

- Construction Leadership Council (CLC) ,
- NIC,
- ICG,
- I3P,
- ACE

Research Councils: EPSRC, Innovative UK

Identifying KPIs for successful innovation in transport infrastructure

CLC example



Thank you