The Centre for Systems Engineering and Innovation supports the application of systems engineering in the construction sector. The aim is to bring world class research on systems engineering and innovation into the sector to transform production of the built environment. The Centre acts as a hub for related inter-disciplinary research across campus on both systems engineering and innovation as applied to buildings and infrastructure. We are looking to fund feasibility studies through this call, we expect most proposals to be in the range £5k to £10k, although we will also consider smaller proposals.

Proposals are encouraged on (but not limited to) the following themes and topics:

1. Production systems, modularity, design and optimization of delivery
2. Visualization of interdependencies within and across infrastructures
3. Transitions to deliver value across the life-cycle

**Deadline for submission of proposals: 17 March 2017.** Submission by email to csei@imperial.ac.uk. Decisions will be made by 7 April 2017 and applicants notified of outcome by email shortly thereafter.

The proposal should fit on ONE page of A4 (Calibri 11 font), with the following table and check-boxes:

<table>
<thead>
<tr>
<th>Title of project:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal Investigator:</td>
</tr>
<tr>
<td>Co-Investigator(s):</td>
</tr>
<tr>
<td>Research background (brief context):</td>
</tr>
<tr>
<td>Scope/objectives:</td>
</tr>
<tr>
<td>Fit with the vision and aims of the Centre:</td>
</tr>
<tr>
<td>Methods/work-plan:</td>
</tr>
<tr>
<td>Potential industry impact:</td>
</tr>
<tr>
<td>Added value:</td>
</tr>
<tr>
<td>Overall costs:</td>
</tr>
<tr>
<td>Follow-on plans:</td>
</tr>
</tbody>
</table>

☐ I confirm that the above costs are FEC

☐ If funded, I will be available to present the project and any follow-up research to the Centre for System Engineering and Innovation and its industry partners and members at the Research Showcase event on 7 September 2017.

☐ Theme (please circle): 1 / 2 / 3
FURTHER DETAILS

Research topics

Following a roadmapping exercise undertaken by the advisory board, suggested topics include (but are not limited to):

Theme 1: Production systems, modularity, design and optimization of delivery

- Analysis of the component structure of large infrastructure systems
- How do we apply systems engineering to scheduling and planning?
- Design for efficient, intermodal supply chains for off-site construction
- Modularity – what is the optimum balance between factory and site content?
- Standardisation of modular components across manufacturers
- The relationship of systems engineering with project management process and methodology

Theme 2: Visualisation of interdependencies within and across infrastructures

- Interdependencies between infrastructure system
- Quantification of risks arising from interdependencies
- Analysis of delays and interdependencies in large projects
- Self-monitoring infrastructure

Theme 3: Transitions to deliver value across the life-cycles

- Life cycle – how can you future proof infrastructure systems for long term operation?
- Long term integrity of data about infrastructure systems and populating information models of existing structures
- How systems engineering supports carbon neutrality through a whole asset lifecycle focus

We also encourage research that extends recent work at Imperial, with a particular focus on systems, such as that on visualization, network analyses of infrastructure systems or resilience of systems; or on operational systems safety, the hand-over between projects and operations, cyber-security, validation of legacy data, and facilities management, or broader issues of project life-cycle associated with the circular economy.

We also particularly encourage research that uses a systems engineering framework, maps systems performance in construction, considers the relationship between standardisation and performance efficiency in operations, or that considers early stage set-up of projects from a systems engineering perspective.

The criteria used for assessment are quality, fit with the Centre, impact and timeliness. As a partner of the Centre, Laing O’Rourke will have the opportunity to rank submitted proposals in relation to these criteria. Unless applicants indicate, we will make proposals accessible for a limited period to all the Centre advisory board members and partners (Laing O’Rourke, PPI, Bentley Systems, Mott Macdonald) for review. Final decisions about funding will lie with the Centre Director, Professor Jennifer Whyte, in consultation with the theme leaders.

Please see the Centre website http://www.imperial.ac.uk/csei for further details of the Centre.