

# Innovate UK

## Results of Competition: Infrastructure Systems - Round 2 - 25-36 Months

Competition Code: 1701\_Infra\_R2\_36M

Total available funding is up to £15m for all streams.

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
James Fisher Testing Services Ltd	SmartBridge - Smart Monitoring and Inspection of Bridges Infrastructure	£716,432	£358,216
8power Limited		£489,995	£342,997
TWI Limited		£390,108	£390,108
Knowledge Now Limited		£246,144	£171,000
Brunel University London		£220,516	£220,516
<b>Project description - provided by applicants</b>			
<p>The SmartBridge project aims to revolutionise the monitoring and maintenance of bridge infrastructure by developing an innovative knowledge-based digital platform that will enable the visualisation of bridges' condition and degradation. These virtual models or twins will combine the multiscale 3D numerical models with sensor data collected and processed from real bridge infrastructure, incorporating operating environmental conditions and inspection history. Condition monitoring sensors including wireless accelerometers, displacement transducers, temperature sensors, strain gauges, barometers, hygrometers etc will be placed on bridges and data will be collected, processed and transferred to the digital twin, continuously resulting in a close to real digital twin of the bridge showing real-time conditions. Such a platform will allow bridge operators to predict failure and plan maintenance before incidents occur. It will reduce maintenance costs by 20% and downtime by 60%. The application of SmartBridge will include (1) Continuous remote condition monitoring of bridges infrastructures (2) Risk-based inspection approach to perform intelligent maintenance operations, (3) A better understanding of lifecycle and degradation behaviour of bridges in different operating conditions.</p>			

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<b>Teqniqa Systems Limited</b>	Dynamic Load Reduction and Station Keeping Mooring System for Floating Offshore Wind	£541,101	£378,771
University of Exeter		£249,399	£249,399
DNV GL UK Limited		£43,000	£21,500
<b>Project description - provided by applicants</b>			
<p>The Intelligent Mooring System (IMS) will result in substantial reductions to LCOE for floating offshore wind generation. It is an industry project led by Teqniqa Systems in collaboration with the University of Exeter and DNV-GL. The IMS has a unique approach to mooring damping, pressure based active control with no mechanical moving parts. In addition to excellent load reduction performance, it can be tuned dynamically in operation in response to wind and wave conditions, as well as allowing multiple pre-configured responses to loading thresholds. Offshore structures which would accrue greatest benefits from IMS are large high-cost platforms used in Floating Offshore Wind which need high survivability and optimal station keeping. The shape and steepness of the load–extension curve is variable in operation to adjust to the prevailing metocean conditions. This allows a much wider range of response characteristics than would otherwise be available. The controllable nature of the resistance and stroke length in reaction to platform feedback and requirements such as accurate position keeping, tidal range compensation or attitude efficiency for energy harvesting devices is a unique mooring capability and highly desirable for end users.</p>			

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Soluis Technologies Limited	Augmented WorkEr (AWE)	£448,650	£314,055
Pinnacle Business Solutions Limited		£406,425	£284,497
CLDB Limited		£141,720	£99,204
University of Sheffield		£238,849	£191,079
University of Strathclyde		£119,968	£95,974
<b>Project description - provided by applicants</b>			
<p>This proposal is submitted to Innovate UK for consideration of grant funding to expand the use of augmented and virtual reality in construction, by developing an Augmented Worker System enabling the intelligent design, construction, maintenance and whole-life value of construction buildings. The construction sector is a key sector to the UK economy and is a sector with considerable growth opportunity. The Government have started this investment which continues with the Digital Built Britain programme. Through the implementation of DBB, the industry will be able to deliver faster builds to a higher quality with fewer defects and more sustainable buildings. The challenge for industry is meeting the DBB Building Information Modelling (BIM) level mandated by the UK Government. The Augmented Worker System will target a reduction in cost and waste, whilst increasing productivity. A successful outcome will provide the construction industry with this Augmented Worker System to improve the construction process at every stage. The project will focus on implementing the Augmented Worker System for a modular, off-site construction company to demonstrate the impact of such a system.</p>			

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Route Monkey Limited	FreightShare Lab (FSL)	£625,464	£312,732
DVV Media International Limited		£92,903	£55,742
Transport Systems Catapult		£187,091	£187,091
Heriot-Watt University		£95,870	£95,870
<b>Project description - provided by applicants</b>			
<p>FreightShare Lab (FSL) aims to demonstrate how strategic data and asset sharing between multiple road and rail carriers and shippers can reduce empty running and under-utilisation of freight vehicles. FSL consortium partners Route Monkey, Transport Systems Catapult, Heriot Watt and Road Transport Media will develop an open data software platform for the optimisation and co-ordination of shared assets. The platform will act as a strategic planning tool; integrating job and vehicle data from shippers, fleets and carriers. The 30 month project aims to provide real-world validation of a previous feasibility study conducted by the World Business Council for Sustainable Development (WBCSD) in 2016. The WBC research estimated that asset sharing could deliver a 20% reduction in fleet CO<sub>2</sub> emissions from road transport. Through modelling and consultation, the project will tackle the technical and commercial complexity of multiple organisations seeking operational excellence whilst retaining competitive advantage. It will also undertake a live demonstration of data and asset sharing.</p>			

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Wideblue Limited	Adaptable Design for Low cost, Efficiently Reconfigurable Offshore Wind LIDAR	£353,875	£247,713
SgurrEnergy Limited		£393,696	£196,848
Fraunhofer UK Research Limited		£346,260	£346,260
Thales UK Limited		£61,000	£30,500
<b>Project description - provided by applicants</b>			
<p>This project seeks to reduce the costs of offshore wind by targeting the wind monitoring infrastructure used at multiple stages of wind energy projects. By developing a factory adaptable laser wind sensor design the costs of such remote sensor systems can be reduced - by using a modular approach to the subsystem design, maintenance and down time costs can be reduced. The outputs from this project will include field demonstrators of different wind profilers set up for different applications. These wind profilers are based on LIDAR - (Light Detection And Ranging) and the project brings together wind LIDAR developers, optical product designers, ruggedised optical instrumentation engineers as well as the wind industry end user. The project will make use of wind energy test sites in the UK and also in Germany - where a parallel project - looking at wind LIDAR vertical profiling and validation methods is being set up.</p>			

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