Innovate UK

Results of Competition: Infrastructure Systems - Round 2 - 13-24 Months

Competition Code: 1701_Infra_R2_24M

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
Precision Acoustics Limited	Development of Radiation Resilient Ultrasonic Sensors (ReDRESS)	£405,877	£284,114
Ionix Advanced Technologies Ltd		£475,315	£332,721
TWI Limited		£289,881	£289,881
University of Sheffield		£86,414	£86,414

Project description - provided by applicants

PUBLIC DESCRIPTION:The need to test difficult to access, thick section steel components for weld defects and in-service corrosion that may lead to pressure vessel/component failure in the nuclear power generation industry requires the application of high sensitivity ultrasonic testing (UT) techniques. However the transducers that generate the beams of ultrasound do not operate well in radioactive environments and their response quickly deteriorates such that they are rendered of little use for defect detection/monitoring. This project will research the construction and testing of novel, radiation resilient, ultrasonic transducers manufactured from exotic materials and a variety of probe assembly techniques. The goal is to provide the nuclear industry with a reliable UT solution for prolonged in-service inspection and permanent monitoring. Two scenarios are envisaged: (a) elevated temperature, high radiation inspection close to the nuclear reactor (b) low radiation - inspection of nuclear waste containers stored at bespoke sites over very long periods. Our objective is to develop a series of prototype ultrasonic probes designed to suit the specific in-service inspection needs.

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Return Loads LLP	FreightUp	£41,500	£29,050
Crafted Media Ltd		£105,583	£73,908
Project description - provided by applicants			
The UK road haulage industry is crucial economically (£41.2bn) and environmentally, 22% road surface emissions are from HGVs.Yet 29% of HGVs travel empty. Freight exchanges are web sites where users advertise available loads to a network of carriers to help fill them on return & other legs. But the takeup is than 10%. Exchanges and other platforms are not suited to most users (small operators):-they aren't on-demand, trusted, cost-effective. FreightUP develops & tests the feasibility of a national 'uber-style' web-based software platform, allowing load owners to request on-demand transport from A to B and carriers to immediately contract to provide the service. Carriers can link multiple legs according to where their route takes them in real-time, utilising their vehicles up to 100%. For the first time in this industry it applies state-of-the-art shared-economy technology & business models to this problem. It disrupts by allowing the vast majority to eliminate empty loads. It aims to improve network capacity, efficiency & reduce operational cost & logistics problems. It helps UK competitiveness and could save up to 6Mt/yr Greenhouse Gas (1.2% of UK GHG).			

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THURN Group Ltd	Improved Sub-bottom Data for Offshore Wind	£99,456	£69,619
Project description - provided by applicants			
THURN Group Ltd. develops innovative sonar technologies for specialist applications in the offshore survey industry. This project involves the development of a novel sonar system to improve mapping of sediment layers and objects under the seabed, to address engineering challenges encountered in the planning, design, installation and maintenance of offshore wind energy infrastructure. Climate change priorities have led to increasing demand for offshore wind energy and this has highlighted the engineering challenges, including obtaining adequate information about the sub-seabed. Current sub-bottom sonar survey technology has poor horizontal resolution and low signal levels. This project uses a combination of novel hardware and software to address these challenges, providing better resolution of buried objects and improved depth penetration. This creates significant savings in terms of survey time required per turbine installation and reduces the uncertainty and risk in the site engineering. Funding will enable evaluation of the technical feasability of applying this technology to real offshore sites. If the technical feasability is confirmed, THURN will manufacture products to compete in the global offshore survey equipment market, with systems available for use from 2018.			

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Modus Seabed Intervention Limited	Autonomous Vehicle for Inspection of offshore wind farm Subsea INfrastructure (AVISIoN)	£457,962	£114,491
Osbit Limited		£128,551	£44,993
Offshore Renewable Energy Catapult		£141,893	£141,893

Project description - provided by applicants

The AVISIoN project will address the cost, health and safety risk, and environmental impact of inspecting OWF subsea cables and foundations, and surveying the surrounding seabed. Through the optimisation of innovative and disruptive AUV technology, AVISIoN will unlock a 0.8% reduction in the LCOE of offshore wind. By removing the requirement for vessels, technicians and remotely operated vehicles (e.g. human intervention), AVISIoN will enable low cost, fully autonomous subsea inspections and surveys of OWF. Removing the vessel will reduce diesel emissions and the environmental impact of OWF. The main beneficiary of the project will be Modus, a UK provider of subsea inspection and survey services. The key optimisation will be delivered by the SME, Osbit, who will develop an innovative subsea docking station to allow the permanent residency of the AUV offshore. ORE Catapult will test and demonstrate the AUV hardware developed in the project at its world class test facilities. The project outcomes will demonstrate the benefits of the AUV approach, supporting Modus to secure subsea inspection and survey work in the offshore wind sector. AUV based inspection and survey can result in potential lifetime savings of £1.1bn for the current EU OWF fleet.

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Amey OW Limited	Sensor & Satellite Asset Alert and Management System (SSAAMS)	£336,264	£168,132
Rezatec Limited		£244,984	£171,489
UtterBerry Ltd		£272,543	£190,780
University of Birmingham		£114,447	£114,447

Project description - provided by applicants

The Sensor and Satellite Asset Alert and Management System (SSAAMS) project will take a systemic approach to improving infrastructure management of energy, transport and urban earthwork systems. The core innovation of the proposed system is the development of business decision support tools based on the analysis of low cost sensor data, combined with open access satellite data, and other sources of data to monitor and predict areas of high risk where disruption to urban living might occur. A monitoring and alerting system will identify potential and actual 'failure' events so asset managers (e.g. Amey, Network Rail and Local Authorities such as Sheffield City Council and Buckinghamshire County Council) can take proactive action to mitigate a potential event, or to react quickly and precisely to detected failures therefore making the infrastructure assets more resilient and minimise costly future interventions as well as improving the daily lives of citizens. The benefits of SSAAMS include: 1) improved intelligence, 2) greater asset resilience and longer lifetime expectancy, 3) reduced cost of asset management and event failure incidents, and 4) reduced impacts on citizens from transport, energy and urban system disruptions.

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Enable International Limited	MyJrny – Intelligent Infrastructure for Mobility-as-a-Service	£690,572	£483,400
Arriva UK Trains Limited		£227,993	£113,997
West Midlands Combined Authority		£59,641	£59,641
Project description - provided by applicants			
MyJrny is a novel mobility-as-a-service (MaaS) platform that securely combines customer data with transport operator information in order to deliver enhanced journey experiences. It's the first MaaS provider that matches an unique understanding of an individual customer's specific journey requirement(s) with real-time transit network data, alongside data sourced from a network of low-costs sensors installed in major transport interchanges. It dynamically integrates and delivers highly personalised multimodal journey guidance over existing transit network infrastructure and systems, based on available capacity. Abstracted mobility intelligence generated by the platform is shared with transport operators, who in turn leverage this data to enhance asset utilisation and exploit novel servitization opportunities. A prototype deployment hosted in the West Midlands will measure how MyJrny positively affects regional travel behaviour, generates operational efficiencies for operators, and enhances customer journeys. Led by Enable International and supported by Arriva UK Trains and Transport for West Midlands, the pilot will demonstrate an open data and infrastructure systems exploitation model that proves commercial viability and enables accelerated market entry.			

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Costain Limited	Infrastructure UAV Pathfinder	£54,621	£27,311
SenSat Surveying Ltd		£313,262	£219,283
Transport Systems Catapult		£142,446	£142,446

Project description - provided by applicants

A 21st century infrastructure is the bedrock of our social and economic stability. Infrastructure projects provide huge benefits to quality of life, however the delivery and operation can be disruptive. We want to reduce this disruption to the public by accelerating the use of Unmanned Aerial Vehicle. Improving safety is always our top priority, we want to reduce injuries and fatalities in the infrastructure sector through the use of advanced aerial robotics to reduce persons involved in hazardous work. Reducing the environmental impact of infrastructure projects is becoming more and more important. We want to cut carbon emissions by enabling UK business to access the inspection and surveying capabilities of cost effective battery powered UAV solutions. Reducing delays associated with large infrastructure projects benefits everyone. We want to reduce delays through regular mapping of infrastructure to provide relevant and up to date engineering information, this will help effective management and reduce delays. Improving the capacity of Infrastructure is enabled by reducing incidents and downtime, accessibility to regular maintenance information allows engineers to target problems before they become a disruption.

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Loowatt Ltd Thames Water Utilities Limited	HIT (Human waste systems Integration Technology)	£353,789 £41,362	£247,652 £20,681
Project description - provided by applicants			
* Challenge - Flushing human waste (HW) with potable water and treatment in UK's aging urban sewerage infrastructure is financially, socially and environmentally unsustainable. Poor systems integration and citizen-centric challenges require radical innovation. * Significance - This project will integrate systems to offer a waterless toilet, logistics and digital platform that records and coordinates HW, collection and delivery. This project could inspire larger operations, which could lead to even greater CO2e, water and Energy savings. * Innovation - This HIT project focuses on system integration, using an agile, user-centred approach to R&D, adjusting strategy according to results. To aid urban living and associated infrastructure, this project will innovate an off-grid waterless toilet, IOT sensors and a digital platform. * Content - This project will research systems integration and citizen issues to integrate and relate infrastructure systems (incl water, Anaerobic Digestion (AD) and transport), and related public health and environmental issues such as council parks. * Outcomes – oiutcomes will radically increase partners' competitiveness by demonstrating the value of the system for saving water and generating net positive renewable electricity from HW.			

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Horsebridge Network Systems Limited	SkyBridge	£2,471,473	£1,482,884
Rinicom Limited		£962,000	£673,400
University of Lancaster		£263,118	£263,118
University of Surrey		£461,218	£461,218
Bentley Motors Limited		£82,548	£41,274

Project description - provided by applicants

The SkyBridge project brings together unique & innovative organisations of SME's, Universities & an automotive OEM to form a 5G Innovation Value Chain in a collaborative development of a network connectivity solution for passenger journeys & smart cities. This solution leverages a defence sector technology from Horsebridge which allows the user to benefit from the secure, aggregated bandwidth from up to 4 mobile network operators & tailors it specifically for smart infrastructure & connected transport needs. In particular SkyBridge will be future-proofed to ensure compatibility with emerging 5G standards across secure, massive & critical IoT platforms. This novel connectivity solution allows improved & enhanced services to be provided to consumers to enrich their passenger experience & enables the provision of better services, greater flexibility with wider economic, social & environmental benefits. SkyBridge supports the UK's drive to develop capability & technologies which will position it at the forefront of the 5G Smart & Secure Living environment.

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