

# Innovate UK

**Results of Competition: Infrastructure Systems - Round 2 - 6-12 Months**

**Competition Code: 1701\_Infra\_R2\_12M**

**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.**

<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
<b>ProNetix Limited</b>	SmartSite/DriverNet - developing a cloud infrastructure for connected logistics and sites	£97,916	£68,541
<b>Project description - provided by applicants</b>			
The SmartSite/DriverNet project will introduce a cloud infrastructure that enables unlimited smart connections between customers, sites, drivers and vehicles to remove unnecessary levels of waste, risk and engine emissions caused by conventional operations. This project will develop the DriverNet mobile and SmartSite cloud applications to a deployable prototype stage, testing a series of modular releases in a simulated operational environment in the field. The aim to highlight the capability of a new collaborative operations environments for sites and fleet operators that optimises delivery and performance via cloud based infrastructure.			

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<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
Eleven Integration Limited	Wind Turbine Blade Condition Monitoring System	£99,947	£69,900
<b>Project description - provided by applicants</b>			
Development of an innovative, wind turbine blade specific, condition monitoring product.			

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<b>UrbanThings Limited</b>	OpenTicket: Unlocking the potential of universal mobile ticketing	£92,510	£64,757
<b>Project description - provided by applicants</b>			
Good mobile ticketing ('m-Ticketing') is essential to encourage greater adoption of flexible methods of payment and charging. Mobility as a Service is underpinned by this, and the ability to charge customers based on their usage, which requires operational insight into the movements of travellers. With existing approaches to transport m-Ticketing lacking such operational insights and often incurring significant deployment costs, UrbanThings proposes a new, low-cost approach to m-Ticketing that connects multiple modes of transport. This combines low-cost consumables with Bluetooth Low Energy beacon technology and a greater role for consumer-owned devices. Following an in-house feasibility study, industrial research will be conducted to further development in this area, with key components brought to prototypical stage in preparation for a pilot study. Key algorithms for sensory validation will be refined and optimised with a view to protecting this new intellectual property.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Highway Surveyors Limited	Real Time Traffic Speed Condition Survey (RE-TRAC)	£355,474	£248,832
University of Birmingham		£122,455	£122,455
<b>Project description - provided by applicants</b>			
RE-TRAC is a collaboration between HSL Ltd. and the University of Birmingham (UoB) to develop a multi-sensor platform to assess the condition and deterioration of local roads. The project will result in the current underfunded local road maintenance programmes to be better resourced, by providing cost effective preventative maintenance data. Poor data will lead to poor maintenance decisions such as the wrong treatment at the wrong time or in the wrong place and in turn will lead to unnecessary road deterioration. To address this, RE-TRAC will develop an automated process to collect and analyse road cracking and fretting (surface deterioration which leads to potholes) data at much higher levels of accuracy than current slow and expensive visual surveys using a suite of sensor technologies. The resulting information will improve asset management decision making and thereby yield a better return on road maintenance spending thus facilitating the preservation of our local roads and reducing, through improved road condition, road use costs.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Austin Consultants Limited	Satellite Application and Analytics for Renewables Integration (SAARI)	£80,848	£56,594
<b>Project description - provided by applicants</b>			
<p>Austin Consultants (AC) are a software and hardware engineering design, development, integration and test solution SME, having grown from a two-man engineering team back in 2005 to the highest certified LabVIEW integration house in the UK. Having worked across the energy and utilities industry, AC have identified a prototype Satellite Application and Analytics for Renewables Integration (SAARI) that estimates wind speed and direction, cloud optical thickness and cloud entrance/exit patterns over Renewable Energy (RE) assets using high-resolution satellite earth observation image processing and machine learning techniques. As new wind and solar capacity is added worldwide, generation using these technologies rises from 5% in 2015 to 30% of the global total by 2040 (BNEF, 2016). This requires improved forecast techniques for the optimal integration of RE into energy systems and markets. SAARI unlocks the access to low cost and scalable RE yield prediction analytics, adding intelligence to energy infrastructure systems. This feasibility study tests the technical and commercial potential of SAARI, applying cutting edge technology to improve the accuracy, scalability, user experience and reduce the costs of accessing RE data analytics.</p>			

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Total Trip Limited	Bluetooth Low Energy Smart Transport Ticketing (BLESTT)	£99,411	£69,588
<b>Project description - provided by applicants</b>			
<p>UK cities are the epicentre of economic growth as populations are growing at a rapid rate; for example between 2004-2014 the population of Oxford grew by 11.6%, Cambridge by 14.5% and Milton Keynes by 18.1%. This places significant stress on city infrastructure, particularly on transport infrastructure and assets, whereby significant investment is required to keep up with the demands of population growth. The social amenity of commuters is also severely affected by overcrowded services. Total Trip strives to address and solve these constraints on urban transport infrastructure. The BLESTT app will allow commuters to use smartphones to enjoy truly ticketless travel (without tapping-in/tapping-out) as well as incentivising travel on less busy services / routes. Network operators will have better oversight of asset usage and can redistribute under-utilised assets onto peak services, thus curbing the need for investment in new assets. This project progresses the BLESTT approach by facilitating further development of an alpha system to facilitate system testing, data gathering, gain further market insights and approaches to customers/investors.</p>			

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The Yellow Bike Company Ltd	Open access secure smart bike stand network	£77,127	£53,989
Marchwood Technologies Limited		£22,722	£15,905
<b>Project description - provided by applicants</b>			
Introduction of a disruptive and innovative commercial and technical solution to secure bike parking in the urban environment. This solution will facilitate competition and provide security, urban safety and recharging facilities to all bikes and all riders, hired or privately owned. The solution reuses existing street furniture for greater efficiency, and brings the parking of bikes to locations convenient for the user.			

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Sustainable Ventures Development Partners Ltd	Smart Waste Infrastructure & Forecasting Telematics (SWIFT)	£99,804	£69,863
<b>Project description - provided by applicants</b>			
<p>Current methods of waste collection have remained largely unchanged for decades, whereby significant inefficiencies exist in the system, creating unnecessary air pollutants and the congestion of busy urban roads. Smart Waste Infrastructure &amp; Forecasting Telematics (SWIFT) seeks to address these issues through the use of sensors and collection route optimisation. Retrofitting/installing the SWIFT device in bins/skips will also lead to a reduction in the incidence of litter resulting from overflowing bins/skips (improving the amenity of urban areas) and fly tipping. Throughout the UK, 37 of 43 zones are in excess of the mean annual limit for NO2 emissions (commonly associated with vehicles), the incidence of litter has not declined over the past 12 years and costs between £717- £850Mpa and there were 852,000 incidents of fly tipping 2013-14. This project seeks to confirm the impacts on emissions, truck movements, litter and fly tipping hypothesised to arise as a result of installation of the SWIFT device on bins and skips used for waste collection in the commercial and industrial (C&amp;I) waste sector.</p>			

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Community Broadband Network Limited	Community Electric Vehicle Energy Network (CEVEN)	£51,654	£36,158
Cybermoor Services Ltd		£48,346	£33,842
<b>Project description - provided by applicants</b>			
Community Electric Vehicle Energy Network (CEVEN) responds to the need to develop electric vehicle charging infrastructure for 8 million homes without off street parking. The project will: a) develop a network of community owned charging infrastructure around the UK; b) give people the tools to locally finance a community chargepoint; c) encourage the take up of electric vehicles, allowing people to save money on fuel costs; d) reduce air pollution and CO2 emissions. We are looking for feasibility support to develop methodologies for communities to finance their own electric vehicle (EV) charging points. The requirement for EV charging will expand markedly over the next 10 years as prices of vehicles drop and range improves. However 30% of homes do not have a driveway where they can plug in a vehicle, slowing takeup with this group. The project will support the further development of off street parking infrastructure and fill gaps in the charging network. It will leverage the partners existing experience in delivering community owned broadband infrastructure in a new fast growing area. Keywords: Chargepoint, Community, Electric Vehicle			

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R-Tech Consultants Limited	A novel integrity model for stainless steels in high temperature Nuclear applications	£99,946	£69,962
<b>Project description - provided by applicants</b>			
<p>In long-term high temperature service, austenitic stainless steels show considerable microstructural development, with often life-limiting changes in mechanical properties. Currently industry relies on conservative mechanical test data to assess remaining plant life, without reference to the actual metallurgical condition. This project builds on an earlier Innovate UK funded study which demonstrated the feasibility of a method for classifying the microstructural condition of austenitic steels, correlating this to mechanical performance, and producing an innovative preliminary structural integrity model. That project focussed on the life extension of the UK's AGR fleet, in particular the austenitic steels used in heat exchangers for tubing and supports. This project will focus on the metallographic assessment of 250+ specimens creep tested between 550 and 700°C, for up to 190,000 hours and ten ex-AGR samples with lives up to 178,000 hours – all provided by EDF Energy Generation. With supplementary mechanical testing, these results will enable us to develop and validate the model to a commercialisable stage. Exploitation will enable Metamet to develop a new business stream in high temperature plant integrity.</p>			

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Infinite Renewables Ltd	ADvanced multi-Energy management and oPTimisation time shifting platform (ADEPT)	£452,375	£316,663
University of Sheffield		£151,800	£151,800
<b>Project description - provided by applicants</b>			
<p>This project will create an innovative time-shifting process for advanced power management and optimisation of distributed energy resources. Specifically it will focus on Time-Shifting Grid Power – importing cheap and efficient electricity during low-demand periods and storing the power to support peak-demand periods; Offsetting TRIAD Costs - incorporating prediction tools to respond accordingly to Triad periods, which are not known in advance; Managing Micro-grid Systems - integrating Distributed Energy Resources to intelligently manage a Micro-grid system and supply residential developments with a combination of renewable, stored and grid power, resulting in lower electricity costs for the residents. State-of-the-art power management units for Micro-grids combine monitoring, generation/load forecast, load shedding, etc. to optimise the energy efficiency. The business model and commercial partnerships is in place to exploit the results. Infinite Renewables Ltd are currently engaged in 26 energy park projects, and have links to over 2,000 new and existing energy projects in the UK, as well housing association projects for IR to target after successful demonstration.</p>			

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Electric Blue Limited	Making Clean Air Zones easier, cheaper, quicker & smarter-enabling emission-based pricing	£114,462	£80,123
Coventry City Council		£6,086	£6,086
Emissions Analytics Limited		£36,828	£25,780
Omnia Smart Technologies Limited		£25,583	£17,908
<b>Project description - provided by applicants</b>			
<p>■ Poor air quality in populated areas is widely recognised as a national public health issue. In an attempt to combat this and reduce emissions in our cities, the UK Gov has allocated £101m for the creation of 6 ‘Clean Air Zones’ - designated areas where restrictions and charges can be placed on the most polluting vehicles. ■ Original proposals contained plans for 16 CAZs however these plans were curtailed by the high cost of current ANPR technology and is a major barrier to any future voluntary adoption. We aim to address this by using telematics, GPS and geofence technology to create a low cost, integrated solution that can be rapidly deployed to improve air quality. The system will be able to track activity within the CAZ and a vehicle's emissions footprint, enabling the development of an emission based pricing model - penalising heavy polluters and incentivising low emission behaviours.■ Our system requires no heavy road infrastructure, no disruption and will integrate with local authority traffic and parking systems. Our initial findings suggest that we can reduce the capital cost of a CAZ system by &gt;90% and running cost by &gt;50%.</p>			

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Altran UK Limited	ICON: Intelligent Control (for efficient nuclear applications)	£59,926	£29,963
Moltex Energy Limited		£9,623	£6,736
University of Bristol		£29,819	£29,819
<b>Project description - provided by applicants</b>			
<p>Wireless control systems in Nuclear Applications can enable economic growth and improve asset integrity. The ability to remotely-power and securely communicate control responses and asset information within a Nuclear Plant, can make control systems more robust and secure to external influences, such as plant sabotage or loss of electrical power, whilst also making the plant safer for operatives, reducing the number of human interactions required for servicing connections, lowering dosage. The deletion of power/data harnesses from in-reactor applications can facilitate faster deployment and replacement of instrumentation, and flexibility of deployment in hard-to-reach areas can enable monitoring of asset integrity to currently unachievable levels – these advantages can contribute to reduced service downtime and increased profitability for new build, existing plants and decommissioning. This research project explores the feasibility of designing a Nuclear Control System using wireless technology; as well as designing system architectures the research will determine appropriate control contexts, the resultant system reliability claims and approvals route to validate the viability of deploying this technology in Nuclear applications across the UK's Civil Nuclear landscape.</p>			

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Iknaia Limited	Digital Site	£28,209	£19,746
SenSat Surveying Ltd		£47,068	£32,948
Costain Limited		£22,829	£11,415
<b>Project description - provided by applicants</b>			
<p>The collaboration between Iknaia, SenSat and Costain will give infrastructure projects a highly accurate, real-time digital copy of the physical environment with real-time asset tracking and recognition. This innovation will help public infrastructure projects to be delivered efficiently, cheaper and with less environmental impact. It will do this by allowing infrastructure projects to track their assets in the physical environment, reducing total spend on assets and improving the efficiency in which they work. Mobile computing and remote sensing have been identified by the Royal Academy of Engineering as two of the upcoming IT waves that will positively disrupt the business models of all industries. However, the infrastructure sector is widely expected to benefit the least due its lack of preparation in integrating mobile sensing and IT into its business workflows. This partnership between SME's (Iknaia and SenSat) and FTSE 250 construction firm Costain will help to deliver this technological innovation to working infrastructure projects. Working as a feasibility study for further innovations in the same space; the project will deliver on three key innovations; 3D digital modelling, real-time asset tracking and workforce/project engagement.</p>			

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<b>Firesouls Limited</b>	Can the Social Value Exchange be supported by a scalable and interoperable system?	£70,069	£49,048
<b>Project description - provided by applicants</b>			
The Social Value Exchange matches government suppliers with community organisations: the former compelled by law to give resources to local communities; the latter needing resources to deliver projects to help local people. We use market design to optimise user outcomes. We can leverage £210bn of public contracts each year to maximise resources for communities, hitting the sweet spot: maximising resources for communities at a fair price for suppliers to pay for their Social Value obligations.			

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EDF Energy Nuclear Generation Group Ltd	Data over Audio for Industrial Internet of Things	£32,175	£16,000
Asio Ltd		£120,000	£84,000
<b>Project description - provided by applicants</b>			
EDF Energy and Chirp are partnering to experiment with data-over-audio technology in the Industrial Internet of Things. Using audio to transmit data could give a robust, flexible, easily installable connectivity that does not interfere with sensitive equipment. We will investigate this for applications such as health and safety wearables; remote updating of information tags; giving an operator information that they are working in the correct area; edge devices transmitting their readings through a series of rebroadcasters into an existing network. Data-over-audio can extend the existing network infrastructure by creating links between individual devices and a network, enabling the connection of the 90% of devices in the world that wouldn't normally be part of an IoT ecosystem with the 10% of devices that would. Or it can deliver this capability to remote areas or areas that have had disruption of their services.			

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Flexisolar Limited	Smart Hubs	£249,831	£174,882
Turbo Power Systems Limited		£481,917	£289,150
EMSc (UK) Limited		£248,742	£149,245
University of Newcastle		£151,362	£151,362
<b>Project description - provided by applicants</b>			
<p>This project will develop the technical solutions and commercial business models Smart Hubs. Smart Hubs are 400V micro grid interconnectors combined with energy storage and a floating DC-DC bus that optimise voltages across LV networks and Low Carbon Technologies (LCTs). PV, Wind, EV, V2G, CHP, and Energy Storage are multiple energy vectors that unbalance the LV distribution network and cause voltage losses and equipment damage. Smart Hubs will focus of DC-DC energy buffers that support a wide range of LCT. This project will focus on developing a Smart Hub to support high densities of EV charge points (7-300kW/unit) for infrastructure companies servicing the public and private sector. The Smart Hub energy management platform architecture will be flexible and adaptable to evolving LCTs and grid services as they are identified. This project seeks to combine three technology streams that are currently hampered by cost barriers: solar power, EV charging and energy storage. In this way infrastructure costs are shared and reduced through smart interconnected systems.</p>			

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Block Dox Limited	BlockDox - Better Journeys Through Unique Passenger Demand Management Platform	£99,980	£69,986
<b>Project description - provided by applicants</b>			
<p>With implications for customer satisfaction, revenue performance, congestion, route &amp; space planning, operational cost reduction, health &amp; safety, pollution, energy saving &amp; facilities management, having accurate knowledge of the localised demand from passengers is critical data to smart intelligent transport strategies. Passenger demand data underpins the 4 core objectives of the DfT and the Gvt's vision "to make journeys better: simpler, faster and more reliable" whilst supporting jobs, enabling business growth, and bring the UK closer together. BlockDox offers an interoperable platform that can be integrated into existing Transport Management Systems. It combines a patent-pending sensor fusion method with artificial intelligence, unique machine &amp; deep learning algorithms to deliver an accurate assessment of real time &amp; predictive passenger counting/flow. The solution addresses an unmet market challenge with 99% accuracy with the potential to deliver improved operational efficiency, journeys, improved security implications incl. crisis management. Potential for the solution to be applied to other sectors including building/facilities management, retail and event sectors.</p>			

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Highway Resource Solutions Ltd	IntelliSignal	£98,352	£68,846
<b>Project description - provided by applicants</b>			
Temporary traffic lights are essential for performing important road maintenance work. However, they cause major frustration to road users and the resulting travel delays impose a heavy economic burden on society The IntelliSignal project will connect temporary traffic lights to the internet and enable them to adjust their operation to changing traffic flows using dynamic traffic data (i.e. Google Maps).Not only will this significantly reduce delays and improve traffic flows, it also enables local authorities to monitor their traffic management assets in real-time and respond quicker to break downs or low battery scenarios. This will reduce operational costs significantly and make the traffic management operations more robust. IntelliSignal will therefore provide an indispensable tool to improve road network capacity during essential maintenance or improvements works, reduce operational costs and create greater system intelligence in temporary traffic management.			

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Fuel Cell Systems Ltd	HySerVe - A Mini Hydrogen Dispenser for Breakdown Service Vehicles	£98,830	£69,181
<b>Project description - provided by applicants</b>			
<p>There are three models of hydrogen fuel cell vehicles available in the UK today - the Hyundai ix35, the Toyota Mirai and the Honda FCX Clarity. Many more car manufacturers have announced their intention to produce a fuel cell vehicle by 2020 including Kia, Nissan, BMW, Audi and Mercedes Benz. The Office of Low Emission Vehicles has stated that fuel cell technology will play a strategic role in helping to deliver the Government ambition that all new cars be zero tailpipe emissions by 2040. In time, hydrogen fuel cell cars will become commonplace instead of unusual. There will be a network of hydrogen fuelling stations across the UK. Breakdown vans will need to be able to cover hydrogen vehicles, including the ability to top-up an empty fuel tank. The aim of this project is to design and build a mini hydrogen dispenser to be fitted into a breakdown recovery van. Success would be a working prototype, fitted to a service van, with training provided to a couple of engineers. A successful demonstration will enable all UK breakdown services to adopt this technology into their breakdown recovery vehicle fleets as demand grows.</p>			

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# Innovate UK

**Results of Competition: Infrastructure Systems - Round 2 - 6-12 Months**

**Competition Code: 1701\_Infra\_R2\_12M**

**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.**

<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
<b>Origami Energy Limited</b>	DART (Demand-side Assets for Response and Trading) - Origami Energy Limited	£99,974	£59,984
<b>Project description - provided by applicants</b>			
<p>*Issues: NG (National Grid) needs to balance electricity supply, but this is increasingly complex and costly. NG spends £1bn/yr on grid balancing services and imbalance charges account for up to 3% of UK end consumers' electricity bills. DSOs must manage their networks more dynamically but will need to utilise an increasing amount of demand side flexibility to achieve this. Using flexible load/demand such as pumps to provide grid balancing is established in other sectors, however no solution allows NG/DSOs to access a wide range of UK water industry assets (which use 1% of the UKs energy) for balancing services and wholesale trading.*Solution – Project will develop the DART Flexibility Platform which will utilise flexibility of a wide portfolio of water sector assets to provide a range of energy services. The DART Flexibility Platform will allow DSR asset flexibility to be forecast accurately, optimised dynamically, deployed in real time, traded on wholesale energy markets and used in a multi-vector approach to provide new services such as DFFR &amp; constraint management.</p>			

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