PRESS RELEASE

Issued by James Fisher Testing Services on behalf of SmartBridge consortium

SmartBridge consortium in ‘digital twin’ predictive modelling research project

April 2018

- **SmartBridge consortium in cutting-edge research project to develop ‘digital twin’ structural health predictive modelling system.**
- **The aim is to create digital versions of real world structures, offering unrivalled modelling and predictive capabilities.**
- **It is estimated that once in use, the Innovate-UK funded initiative could increase operational lifespans by more than 40 years.**

James Fisher Testing Services (JFTS) has announced a new strategic research collaboration with TWI Ltd (TWI), Brunel University London and Innvotek to form the ‘SmartBridge’ consortium.

The consortium’s aim is to further develop and integrate inspection, modelling, monitoring, big data management and analytics, deterioration diagnostics and prediction to create a ‘digital twin’ forecasting toolkit. The resulting model will provide bridge managers with significantly enhanced decision-making information to extend asset life and manage maintenance costs effectively.

The SmartBridge digital twin can play a vital role in operation and maintenance where two thirds of European bridges are more than 30 years old, with increased risk of ageing components and material failure, exposure to increased traffic volumes and more extreme weather events. The project team estimates that SmartBridge’s predictive and risk based tools will deliver improved return on investment, resilience and sustainability by extending asset life spans by 40 years or more.

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Funded by Innovate-UK, the project is developing the 'digital twin' concept to enable real-time condition monitoring of bridges by creating dynamic 3D models combined with:

- Condition monitoring data collected from sensors on the bridge
- Finite element modelling of the bridge
- Deterioration modelling and prediction
- Operating condition information
- All available historical data to mirror the life of its physical twin

This will offer a more informed and detailed representation than contemporary models as it will include real-time information on suspect structural detailing, loading and other significant events highlighted through historic condition monitoring data using dynamic modelling techniques.

SmartBridge will produce detailed forecasts relating to health, condition, reliability and the remaining life of infrastructure. The level of detail and accuracy afforded by effective big data management will make it possible to improve safety and maximise the operational lifespan of the asset with enhanced, proactive maintenance programmes.

Matthew Anderson, SmartBridge project coordinator said: "This is a great opportunity to bring together inter-disciplinary expertise to share knowledge that will benefit bridge owners, operators and maintainers.

"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 bridge condition and degradation."

The project has received initial positive support from bridge management teams at Amey and London Underground, affirming the desire and need for smarter methods of maintenance programming, with London Underground providing an existing bridge structure to form the basis of the research.

Ash Parmar of London Underground said "We are keen to adopt innovative and cost-effective methods for getting better information about the true condition of our structures. We do not like

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surprises when structures are suddenly found to have major defects which may lead to failures, during inspections. A robust approach for using historic information and real time monitoring data to enable reliable prediction of deterioration and defect occurrence is welcomed. We are pleased to be able to support the development project through the provision of a trial site for use by the consortium."

The project started in late 2017 and it is expected that on-site testing and proving phase will commence in 2018 and continue through 2019. The consortium plans to keep the bridge engineering community informed of the progress at key stages of the project through conferences and seminars.

Ends

Notes to editors

James Fisher Testing Services (JFTS), a part of James Fisher and Sons plc, has a strong track record in the design, manufacture, marketing, and selling of specialist testing and monitoring equipment worldwide. The JFTS team behind this project as coordinator boasts a combined experience of over 40 years in civil and construction engineering across a number of sectors with the majority being in the field of bridge and infrastructure management. Since 2013, the JFTS team has been involved in directing the delivery of the Queensferry Crossing structural health monitoring (SHM) system, with further involvement in the Forth Road Bridge and Mersey Gateway Bridge SHM systems, all of which use the latest BridgeWatch® technology. Visit: www.jftesting-services.com

TWI Ltd (TWI) has long-standing experience in integrity management of structures, particularly condition monitoring research and NDT services for bridges and will support the development of condition monitoring sensors network optimization, risk-based inspection techniques, sensor data processing algorithms and analysing risks for accurate predictive maintenance of bridges. Visit: https://www.twi-global.com/

Brunel University London (BUL) is an academic partner with vast experience in R&D in infrastructures research including data acquisition and analysis techniques. They will lead activities relating to data processing and analytics. Data will be stored on in the cloud-based

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platform, where data analytics will be applied to process the data before visualisation in the SmartBridge digital twin software platform. Visit: www.brunel.ac.uk/bic

Innvotek are contributing the extraction, communication, rapid processing and visual presentation of huge amounts of data in a form that both human beings and systems can interpret rapidly. Visit: https://innvotek.com/

Innovate-UK is the operating name of the Technology Strategy Board, the UK's innovation agency. Since 2007 innovate-UK has committed over £1.8 billion to innovation, matched by a similar amount in partner and business funding. We have helped 8,000 organisations with projects estimated to add more than £16 billion to the UK economy and create nearly 70,000 jobs. Visit: www.gov.uk/government/organisations/innovate-uk

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