



**UKCRIC**

UK COLLABORATORIUM  
FOR RESEARCH ON  
INFRASTRUCTURE & CITIES  
**Inspired infrastructure  
for better living**

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Edinburgh Futures Institute  
The University of Edinburgh

Deputy Convenor, UKCRIC

**Meeting the UK's infrastructure  
Investment Agenda**

# National Infrastructure Strategy

## November 2020 – ‘Fairer, faster, greener’



“Infrastructure underpins the economy...  
vital for jobs, businesses and economic growth.

But it also has a profound impact on people’s  
daily lives.

The government wants to deliver an  
infrastructure revolution”



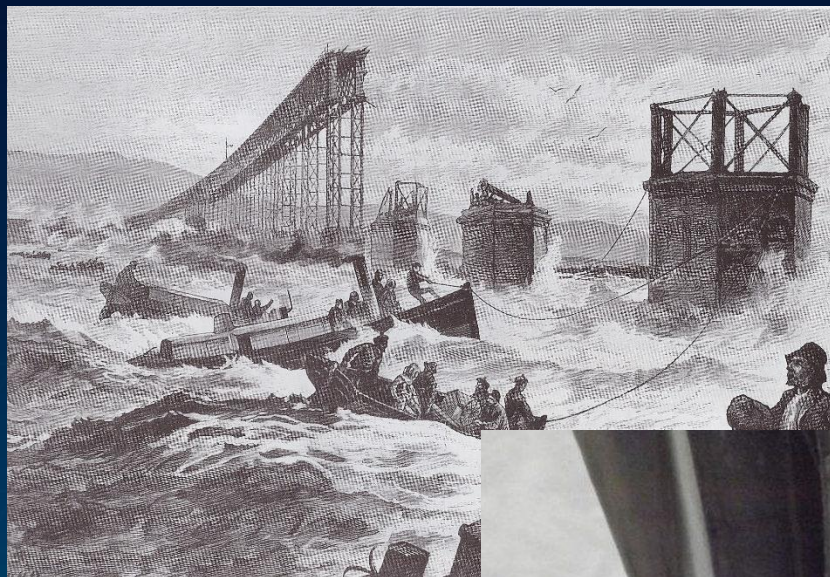
# National Infrastructure Strategy

Fairer, faster, greener

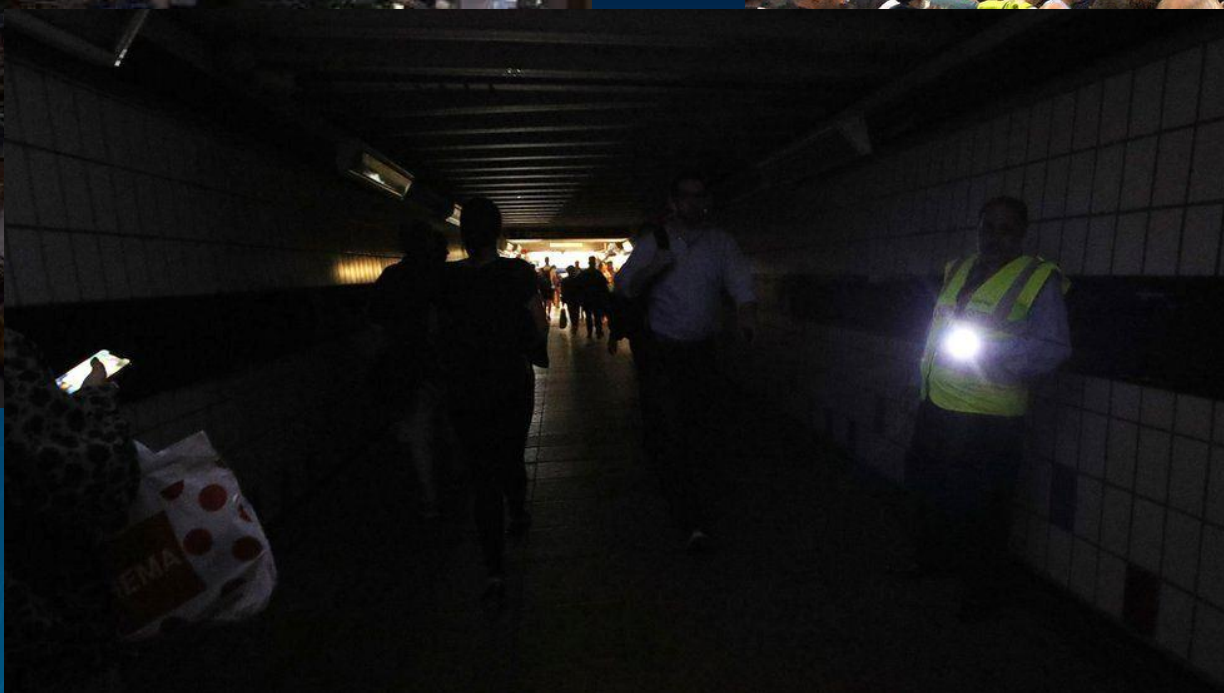
# Infrastructure impacts our Daily Lives



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# National Infrastructure Strategy

## November 2020 – ‘Fairer, faster, greener’



- Driving Recovery and Rebuilding the Economy
- Levelling Up and Strengthening the Union
  - Union Connectivity Review
- Decarbonising the economy and adapting to climate change
- Private investment in infrastructure
- Accelerating and improving delivery



# National Infrastructure Strategy

Fairer, faster, greener

# National Infrastructure Strategy

## November 2020 – ‘Fairer, faster, greener’



“Great nations depend on great infrastructure. Although not the only factor – skills, local leadership and business environment are also fundamental – infrastructure plays a crucial role in resolving disparities between places.”

BUT the systems approach to infrastructure *includes* people, skills, and business environment



## National Infrastructure Strategy

Fairer, faster, greener



# National Infrastructure Strategy

## November 2020 – ‘Fairer, faster, greener’

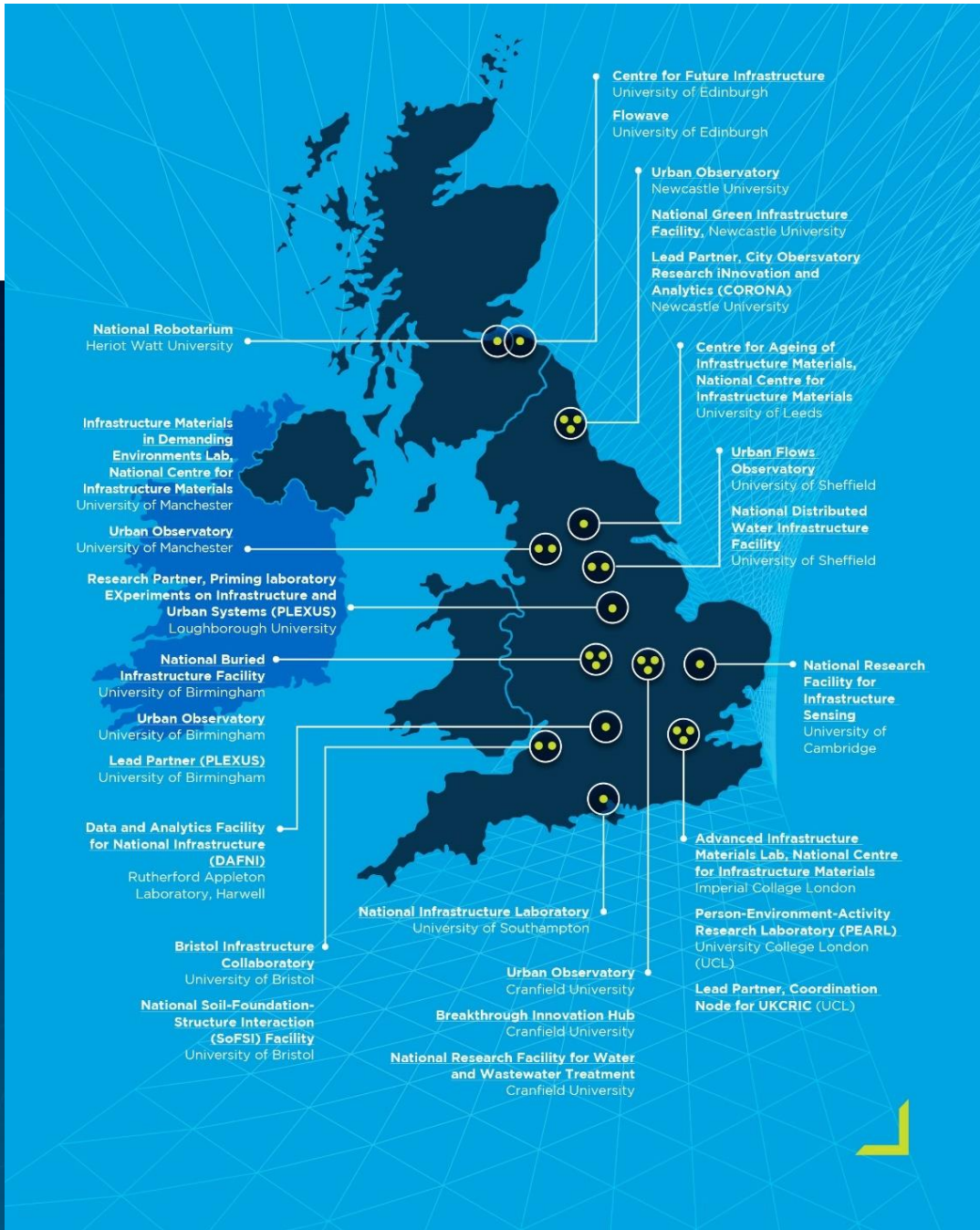


“Infrastructure will not level up Britain on its own. We must work on the skills, on research and on innovation to create new, wealth-generating clusters across the country.”

The cover of the National Infrastructure Strategy report features a red background on the left and a photograph of a multi-lane highway curving through a forest with autumn foliage on the right. The title 'National Infrastructure Strategy' is written in large white letters across the red section. Below the title, the slogan 'Fairer, faster, greener' is written in a smaller white font. At the bottom left, the HM Treasury logo and name are visible.

# National Infrastructure Strategy

Fairer, faster, greener



## Partners

University of Birmingham

University of Bristol

University of Cambridge

University College London

Cranfield University

University of Edinburgh

Heriot Watt University

Imperial College London

University of Leeds

University of Loughborough

University of Manchester

Newcastle University

University of Oxford


University of Sheffield

University of Southampton

## Affiliated facilities

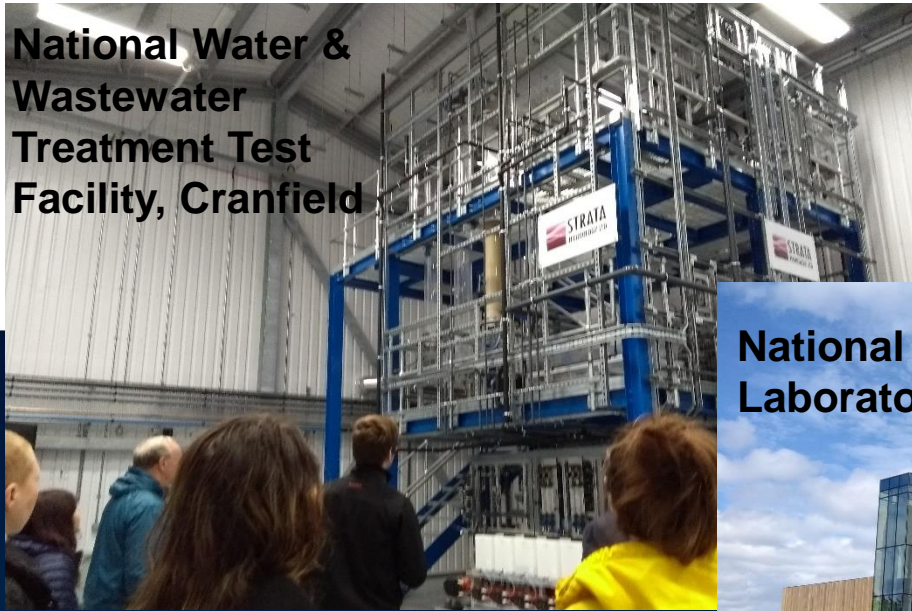
V-Simulators labs at Bath and Exeter

# UKCRIC Vision



UKCRIC provides the transdisciplinary, systems-based research for the transformation of infrastructure and urban systems, enabling safe, resilient and sustainable living, and generating economic opportunities for the UK.

**National Water & Wastewater Treatment Test Facility, Cranfield**



**National Infrastructure Laboratory, Southampton**



**National Green Infrastructure Facility, Newcastle**



**National Distributed Water Infrastructure Facility, Sheffield**



**National Research Facility for Infrastructure Sensing, Cambridge**



# UKCRIC Mission



To nurture underpinning research for the renewal, sustainment and improvement of infrastructure and cities in the UK and elsewhere.

By engaging government, industry, academia and end users, UKCRIC will derisk, help to prioritise, and provide evidence, analysis and innovation for future national infrastructure and urban investments to deliver a safer, more resilient and more sustainable future.

## Transformational infrastructure and resilient urban systems for a changing world

- Pioneering methods to resiliently adapt to the challenges of climate change, sudden perturbations, changing societal expectations and emergent technologies – data driven innovation

## Infrastructure and urban systems for one planet living

- Accelerating sustainability through substantial advances in responsible consumption, resource efficiency and sustainable growth and helping the UK meet its carbon targets



THE UNIVERSITY  
of EDINBURGH



University of  
**Strathclyde**  
Glasgow



Fife College

**babcock**<sup>TM</sup>

**IN DEVELOPMENT**

**Arrol Gibb Innovation Campus**

Overview

# FASTBLADE

## Why we need the project

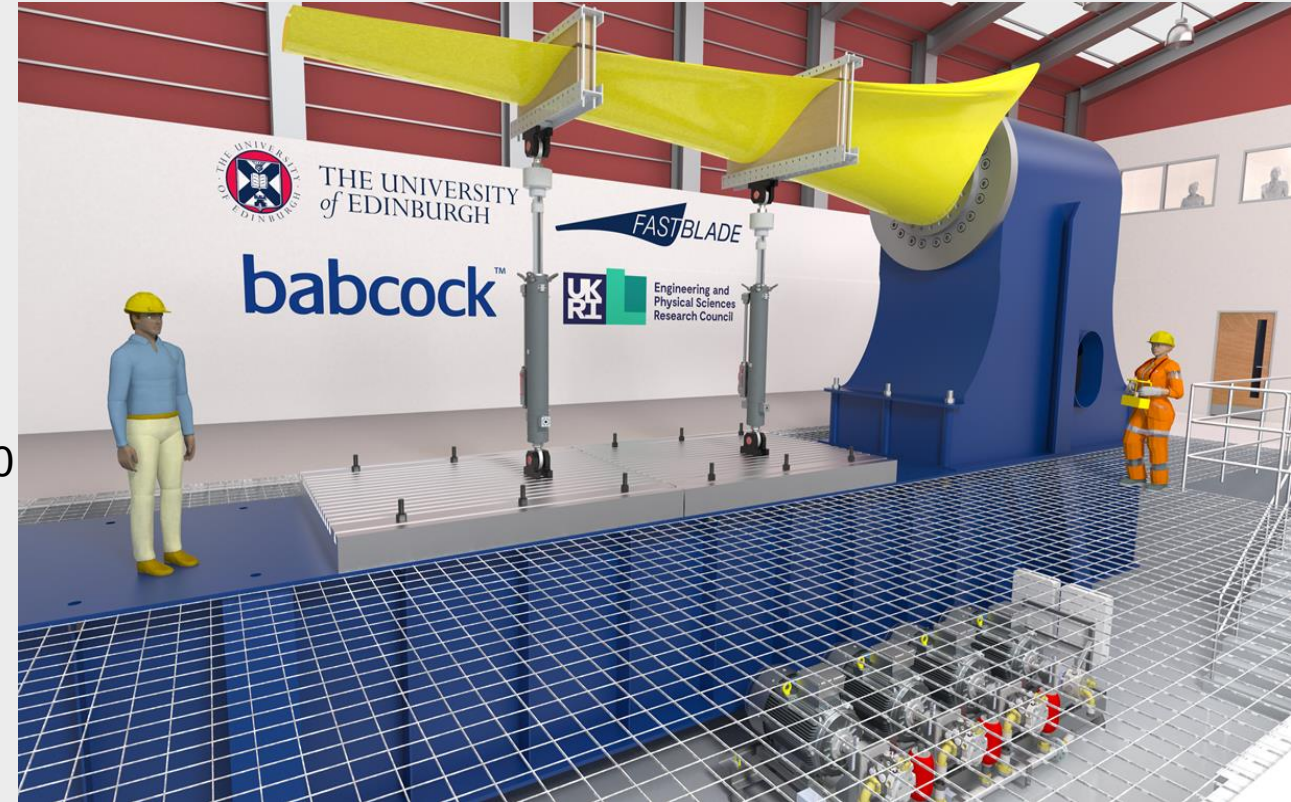
The world's first dedicated rapid fatigue testing facility for industrial scale heavy composite structures (e.g. tidal turbine blades), aiming to increase yield

## Target audiences / interested parties

MacTaggart Scott, Orbital Marine, SIMEC interested

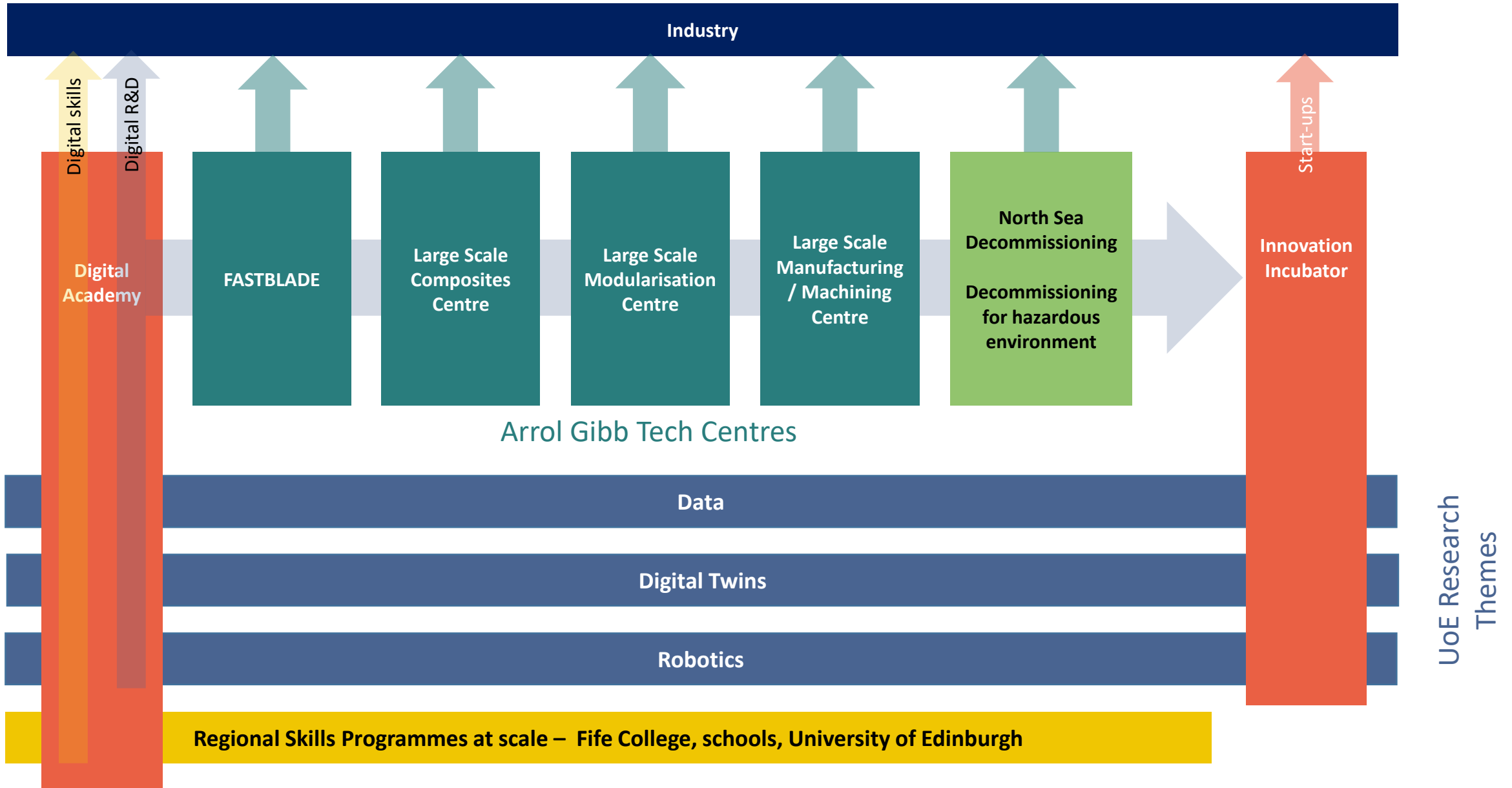
## Project delivery

University of Edinburgh design & operate; Babcock deliver 70 tonne reaction frame & fit out.





# Digital Manufacturing Research – Arrol Gibb vision



## Ownership, governance and business models for infrastructure and urban systems

- Coping with greater system interdependencies, changing patterns of use and new, disruptive technologies whilst at the same time delivering social justice and affordability

## Infrastructure and urban systems as drivers of equity, inclusion and social justice

- Forging healthy, happy and productive lives for all through urban design, planning, policy and infrastructure

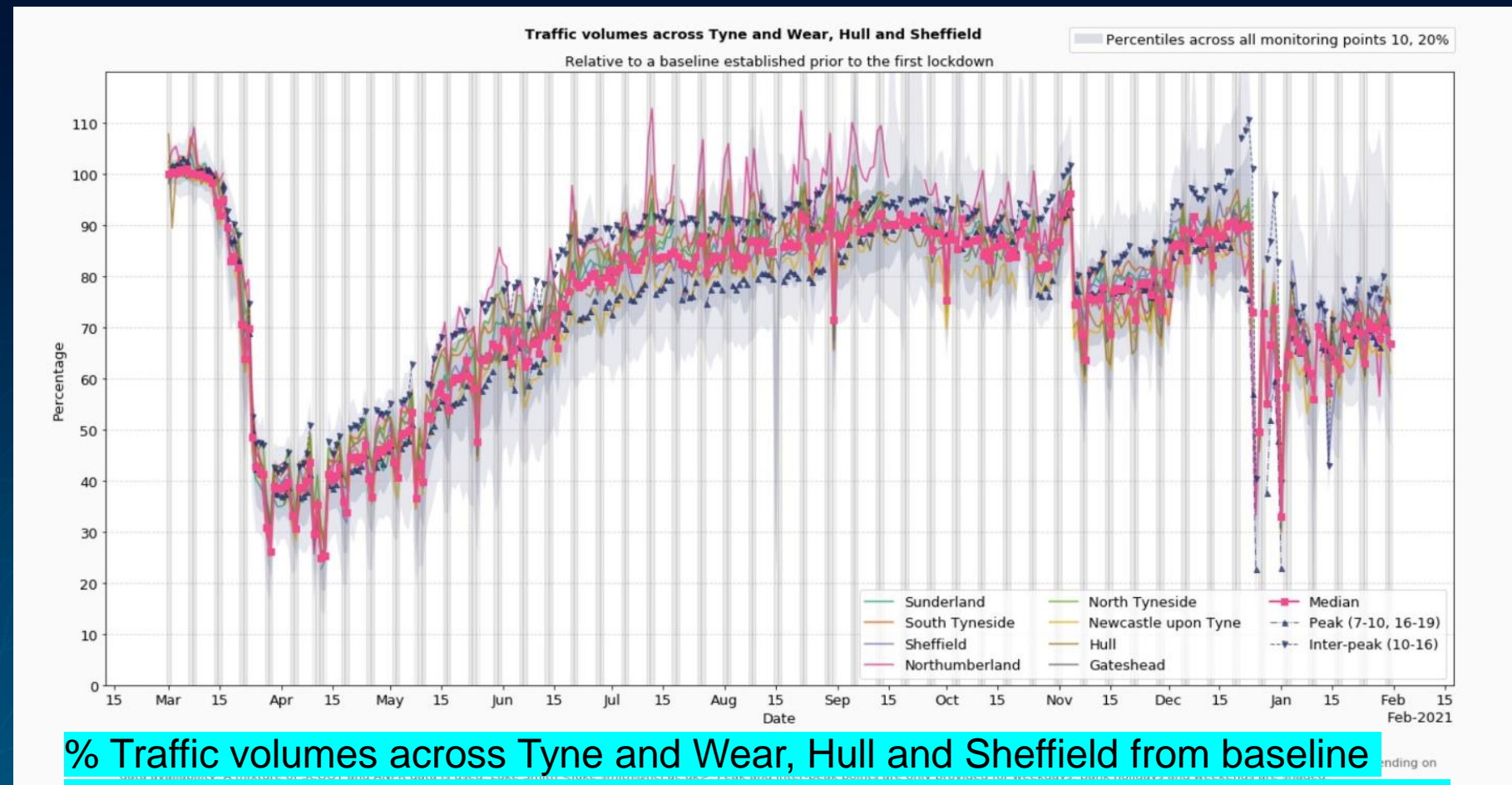
# Urban Observatories Use Case



## Investigating

- Air quality
- Flood Management
- Public Health
- Transport
- Machine learning
- Smart Buildings
- Effects of Covid-19

Open source real time  
urban data



% Traffic volumes across Tyne and Wear, Hull and Sheffield from baseline  
March 2020 (pre 1<sup>st</sup> lockdown) to Feb 2021 (Phil James; Newcastle University)

# Aims for UKCRIC



- 17+ UK universities – (2 more to complete UK Nations/Regions levelling up)
- The National Institute for Infrastructure & Cities
  - similar to Royce, Turing and Crick Institutes, but distributed around the UK and multi/trans-disciplinary / multi-application
- 3 strands: laboratories, urban observatories, DAFNI

# UKCRIC Futures



Key Dependencies	Current Status	With Future Funding
World Class Expertise and Commitment to Collaborate across UK	Green	Green
Modern Laboratory Facilities distributed across UK	Green	Green
Funded Programmes of Research, Innovation & Doctoral Training	Red	Green
Urban Observatories	Red	Green
DAFNI	Green	Green
Impacts on Levelling Up, Decarbonising, Climate Adaptation, Accelerating Improvement & Productivity	Yellow	Green

# UKCRIC in 5 Years



UKCRIC will:

- be seen from the outside as a coherent whole
- be accepted by the wider academic community as both high quality and inclusive
- have smooth functioning links with key industry and government stakeholders; an established pan-UKCRIC CDT; and demonstrable, significant impacts from the findings of its research programme

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