



UKCRIC

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

Data Sharing in Infrastructure and Urban Systems

30 October 2024

Joanne Leach, UKCRIC Executive Manager

UKCRIC's Vision

Inspired infrastructure for better living

UKCRIC's Mission

To connect research with policy and practice in
infrastructure and urban systems



UKCRIC™

UK COLLABORATORIUM
FOR RESEARCH ON
INFRASTRUCTURE & CITIES



UKCRIC™
FACILITIES

National
research
facilities



UKCRIC™
NETWORK

National
research
network

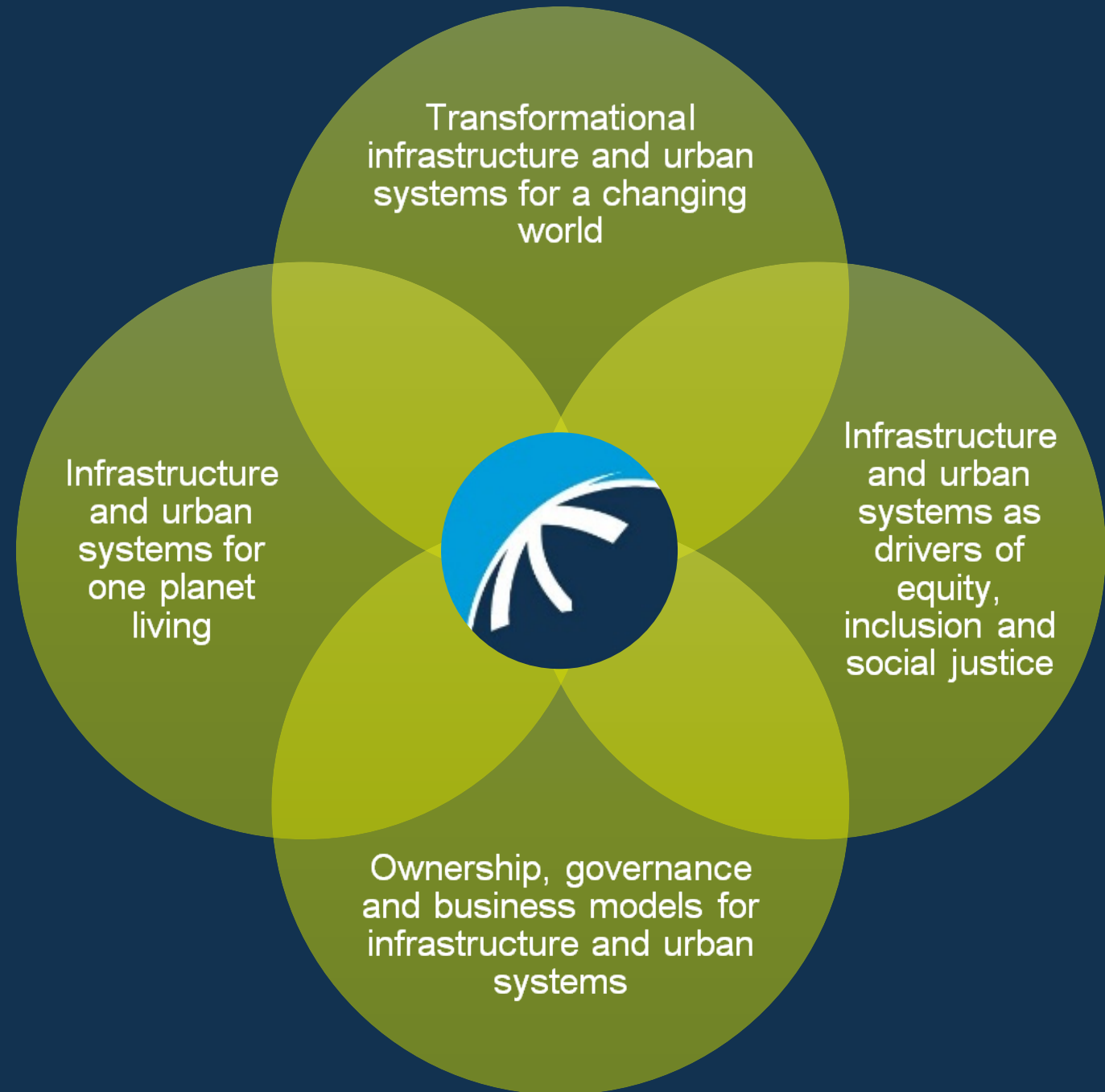


UKCRIC™
IMPACT

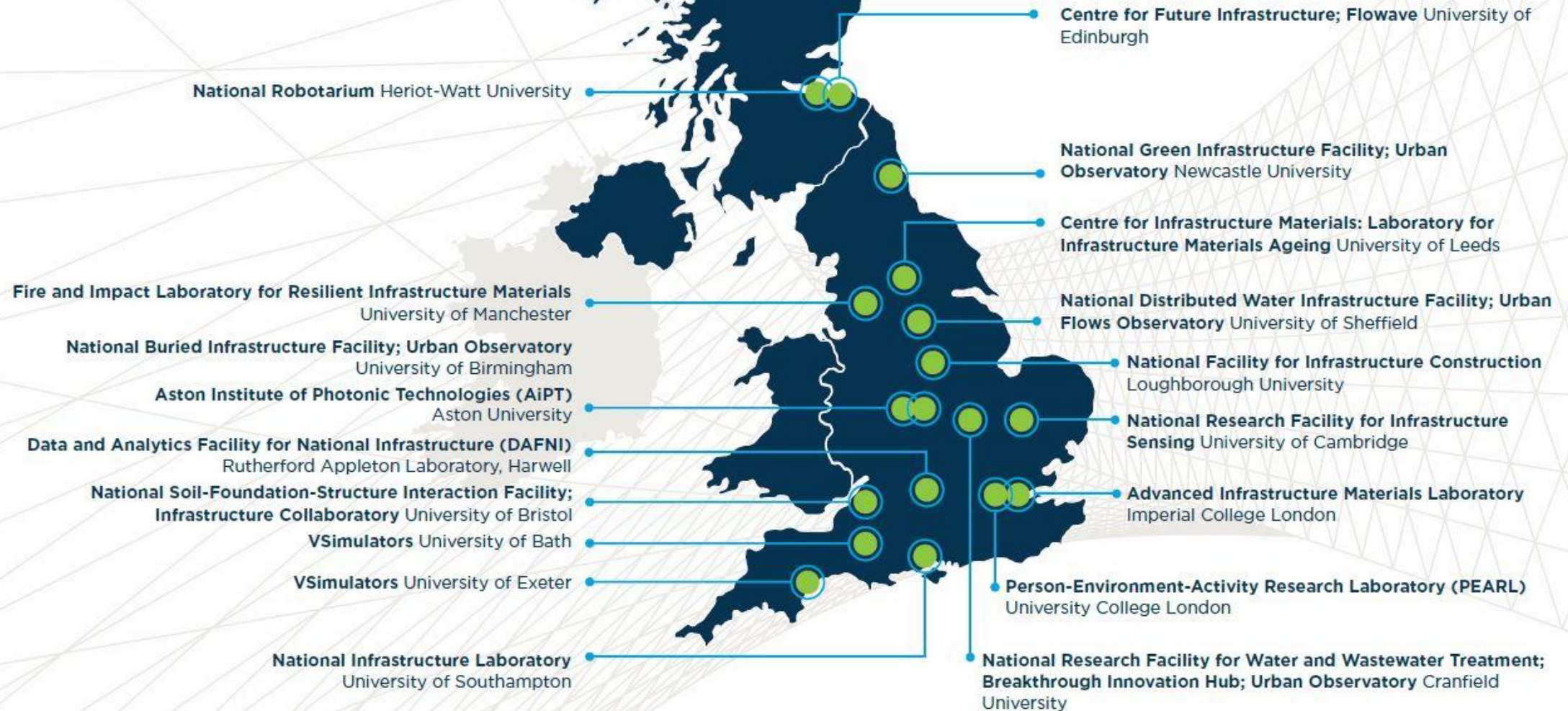
Company
limited by
guarantee

UKCRIC's work is driven by four Scientific Missions, each working to develop and deliver breakthrough research for the benefit of society.

The Scientific Missions are the framing through which UKCRIC facilitates the delivery of interconnected, integrated and transdisciplinary research programmes and projects.

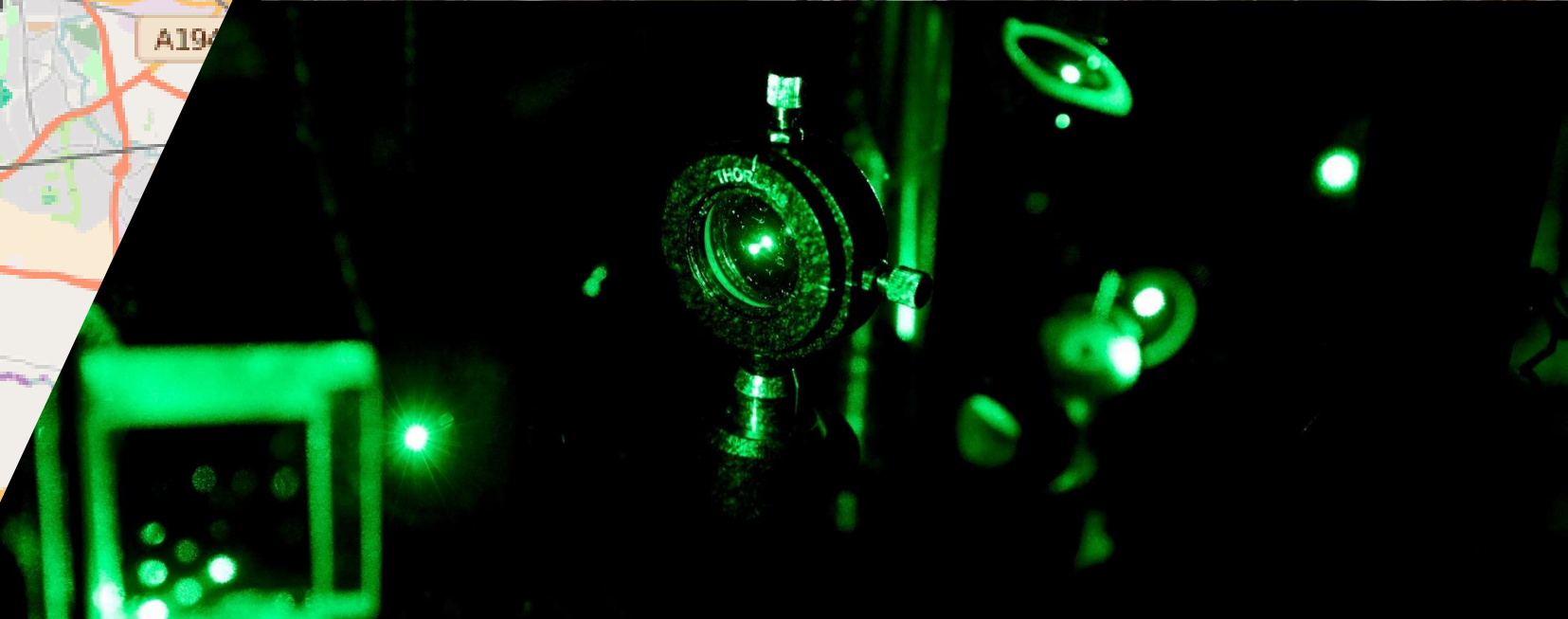
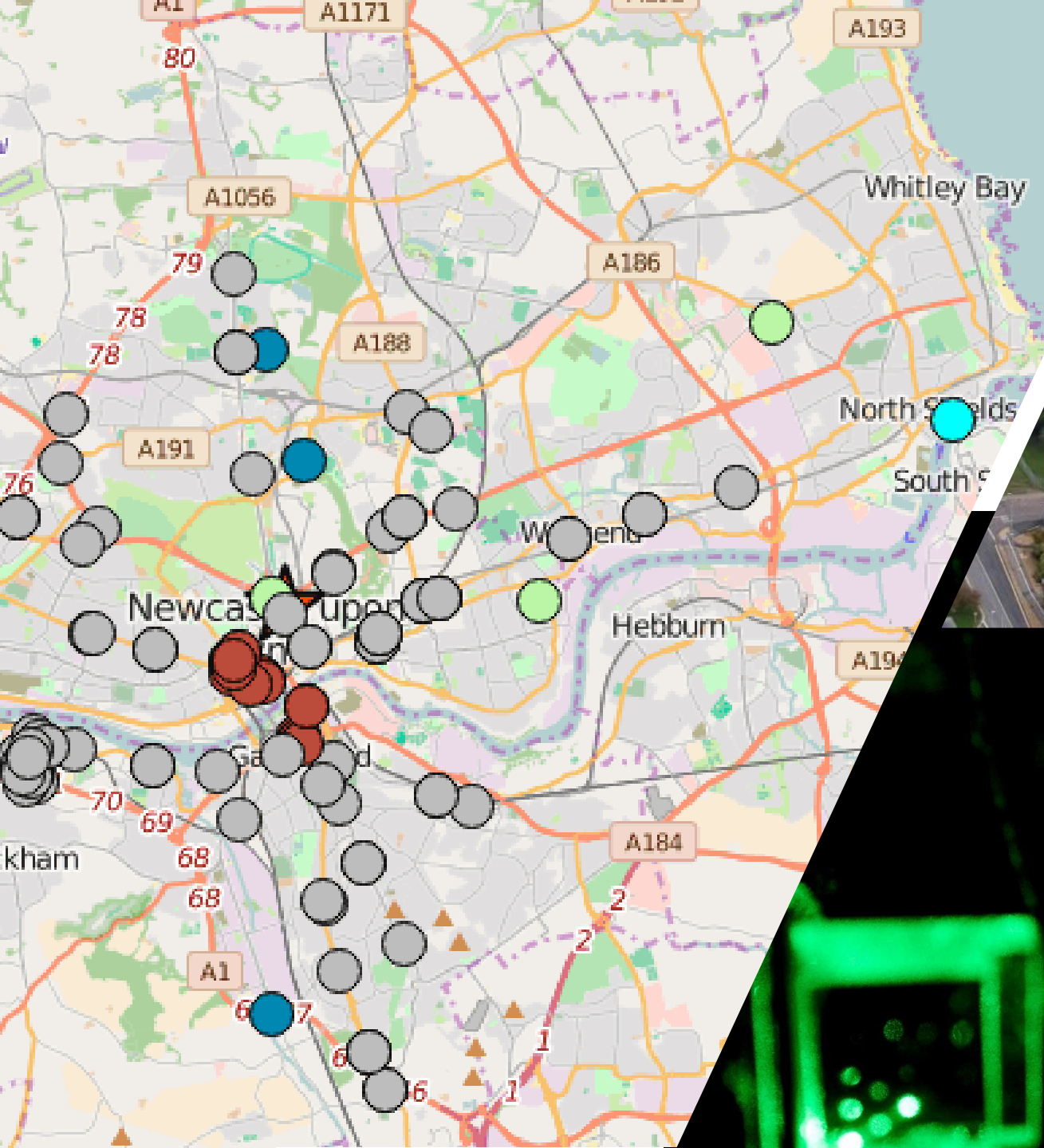


Where to Find Us









Guiding questions for the workshops

1. This discussion is predicated on the need for a 'national research cloud' that supports research data sharing. Do you recognise this need?
2. In your experience, what motivates data sharing?
3. What are the benefits and barriers you have experienced when sharing, exchanging and reusing data?
4. Can you recommend any data sharing best practices?
Examples might be for data policies; data sharing agreements; and data annotation, terminology and ontologies.

Data cloud v. data library

How can the UK transform its data into research assets that can be used to benefit society?

The workshops sought to identify the benefits and enablers of and the barriers to data sharing, exchange and reuse.

Workshop 1

**The challenges of and opportunities for
data sharing between industry and
academia**

There is the nature of data,
which is one layer, and
there is the nature of
data sharing, which is
another layer.

Then there is the nature of
the data library itself.

For data sharing
relationships to be
productive those in the
relationship need to ask:
what is data, for what is it
going to be used, and
how is it going to be
contextualised?

The nature of data

What is data? What does a national research data library consider data to be?

Data is not “a clean thing”

- It varies along the spectrums of quality, context and accuracy
- What it actually measures may not be the same as what it thinks it is measuring

Data exists within a sensemaking context (a context that makes sense of the data). Data on its own is meaningless. The user must have a way of contextualising it / benchmarking it.

The nature of data sharing

For data sharing relationships to be productive those in the relationship need to ask: what is data, what is it going to be used for, and how is it going to be contextualised?

Three elements are required if data is to be effectively shared:

1. knowing the purpose of the data
2. knowing the provenance of the data (its origin story)
3. trusting the data and its source

Willingness to share data is low. Willingness to use shared data is high.

The nature of a data library

Data sharing is more than creating a depository or a federated library. Data sharing requires an ongoing dialogue between the data supplier and user about how the data is being interrogated:

- Are the analyses being proposed sound?
- Is the data being used in a way that is valid and robust?
- Can the data answer the questions being asked of it?

The library must incorporate services that support easier ways to access data, easier ways to establish benchmarks, easier ways to conduct insights and analytics on the data.

“Data sharing must develop a purpose, otherwise it is a hammer looking for a nail.”

Data sharing infrastructure *is* infrastructure and should be recognised as a class of infrastructure that falls under the remit of the National Infrastructure Commission (NIC) (shortly to be NISTA – the National Infrastructure and Service Transformation Authority).

Data sharing infrastructure can't be owned by one group. It is a shared resource.

Mark Enzer

Workshop 2

**The challenges of and opportunities for
data sharing in urban observatories**

University of Newcastle's Urban Observatory



urban observatory
evidence for change

Portal

Graphs

API

Data

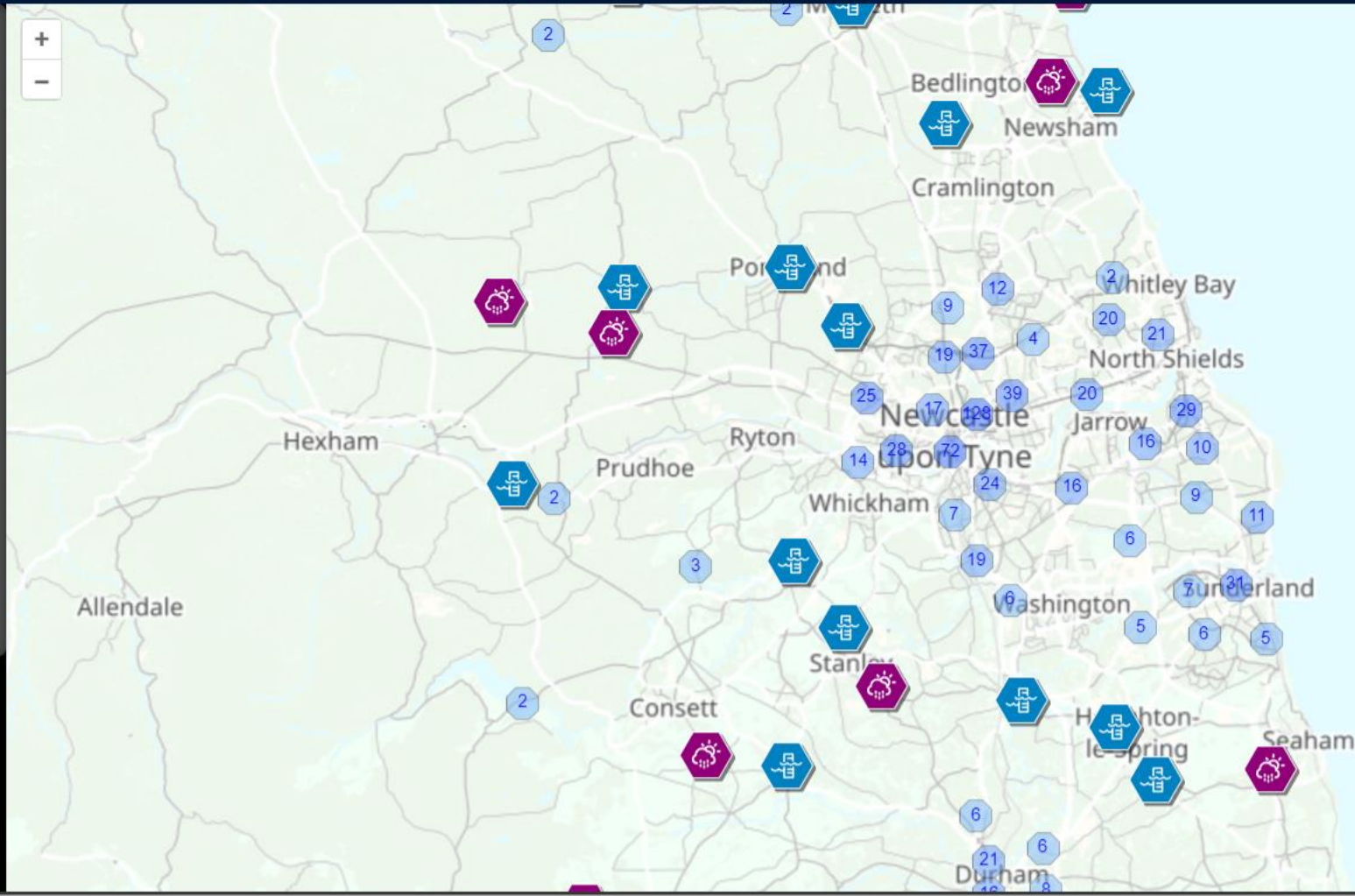
Dashboards

Sensor Clusters

- 2-9
- 10-24
- 25-49
- 50+

Sensors

- Air Quality
- Building
- People
- Sensor Metrics



Database count



urban observatory
evidence for change

Database Count



Portal



Graphs



API



Data




Dashboards

Live Newcastle UO Records

2 , 7 8 2 , 5 4 3 , 4 2 6

two billion, seven hundred and eighty two million, five hundred
and forty three thousand four hundred and twenty six

City heartbeat



urban observatory
evidence for change

City Heartbeat

Portal

Graphs

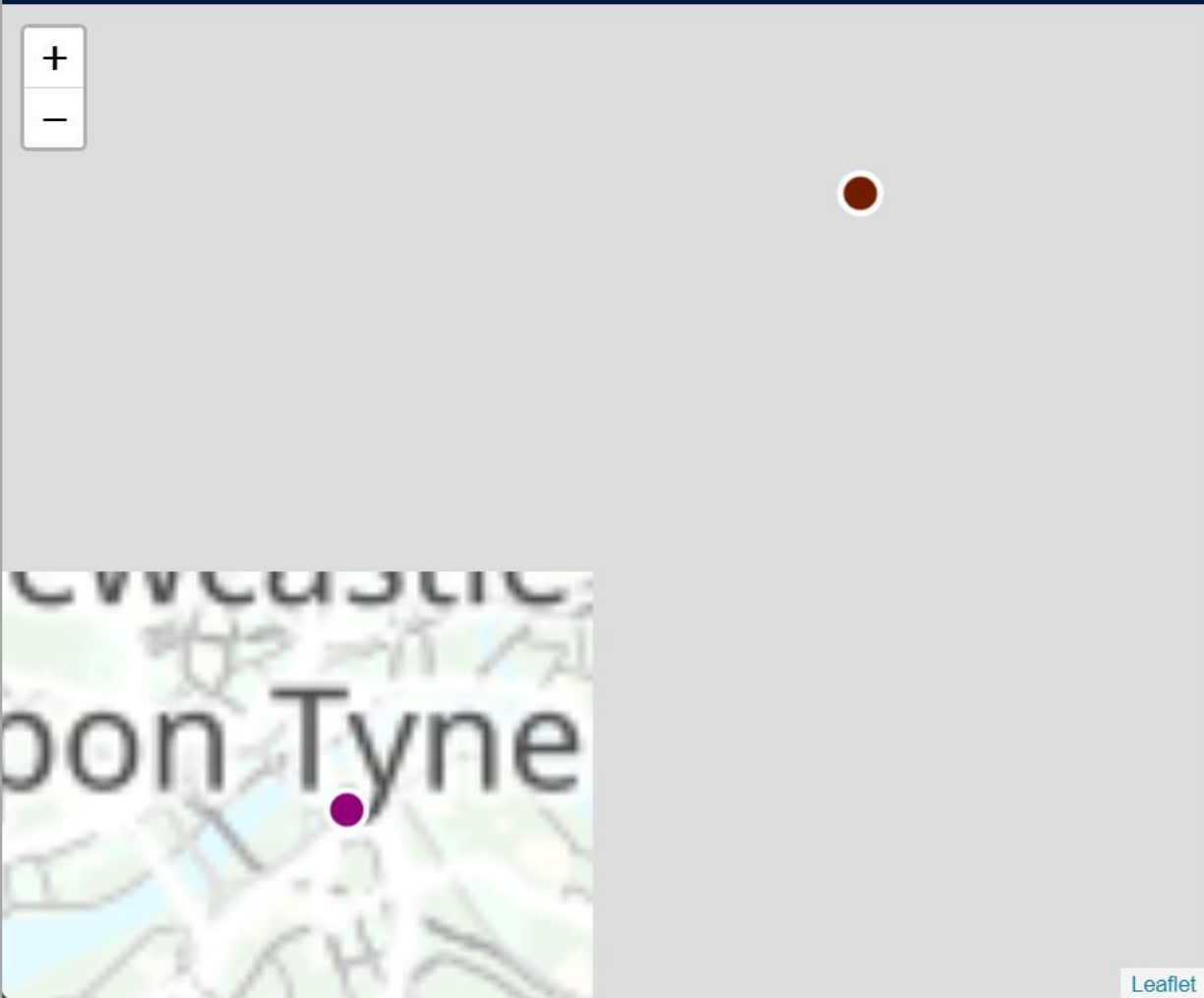
API

Data

Dashboards

+

-



Leaflet

2024-10-30 09:45:00	O3	18.55	ppb
2024-10-30 09:45:00	Particle Count	36.03	Kgm -3
2024-10-30 09:45:00	PM1	1.94	ugm -3
2024-10-30 09:45:00	PM10	8.51	ugm -3
2024-10-30 09:45:00	PM2.5	3.27	ugm -3
2024-10-30 09:45:00	PM 4	4.63	ugm -3
2024-10-30 09:45:00	Temperature	12.90	C
2024-10-30 09:45:00	Wind Direction	0.00	Bearing
2024-10-30 09:45:00	Wind Speed	0.00	m/s
2024-10-30 09:45:00	Pressure	1026.00	hPa
2024-10-30 09:45:00	Humidity	79.40	%
2024-10-30 09:45:00	NO	10.63	ppb
2024-10-30 09:45:00	NO2	11.98	ppb

Traffic cameras

<https://newcastle.urbanobservatory.ac.uk>



urban observatory
evidence for change

Traffic Cameras

Portal

Graphs

API

Data

Dashboards

[03] A191 Church Road &



[04] A191 Church Road &



A186 Westgate Road

[01] Brighton Grove Rd



[02] Brighton Grove



[03] Bri



[03] Meldon Terrace



[01] Warton Terrace



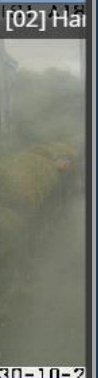
[02] Warton Terrace



[01] Hartford Street



[02] Har



Each group faces particular pressures that influence their ability to share data (such as commercial sensitivities and the ability to handle near-live data streaming), but they also recognise the opportunities afforded by sharing data and see the potential in taking a 'data-sharing first' approach to their work.

Thank you

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