Green Data
COVID-19's impact on environmental data management

14 December 2020

Natural Environment Research Council

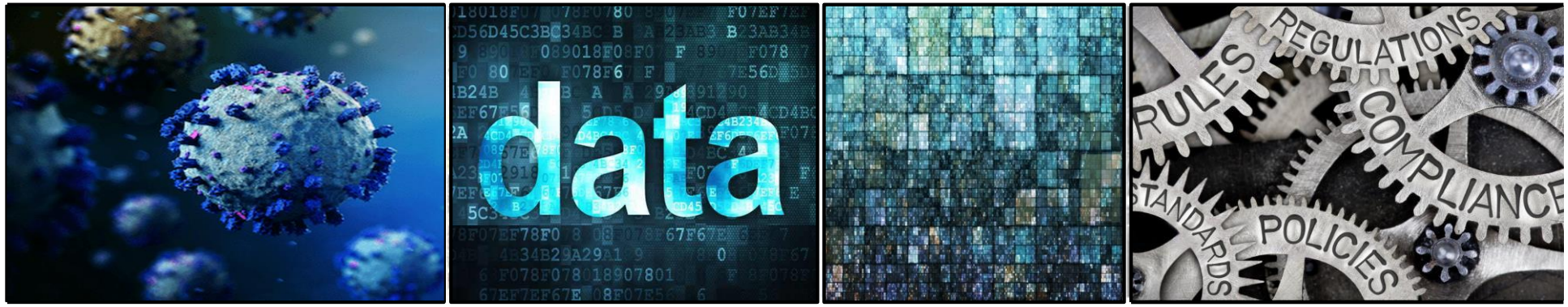
Housekeeping

- This webinar is best experienced through headphones which will cut out the background noise.
- To ask questions please use the **chat** function in your control panel.
- Ask your questions throughout the webinar, you don’t have to wait until the end.
- Don’t worry if you miss anything we will be uploading this to our website in the next few days, so if you want to listen again to us you can!

Simon Gardner
Head of Digital Environment
NERC

Natural Environment Research Council

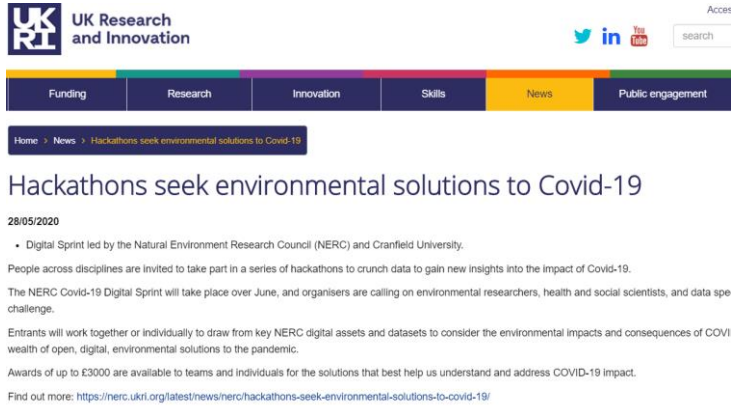
eic environment innovation business



COVID-19's impact on environmental data management

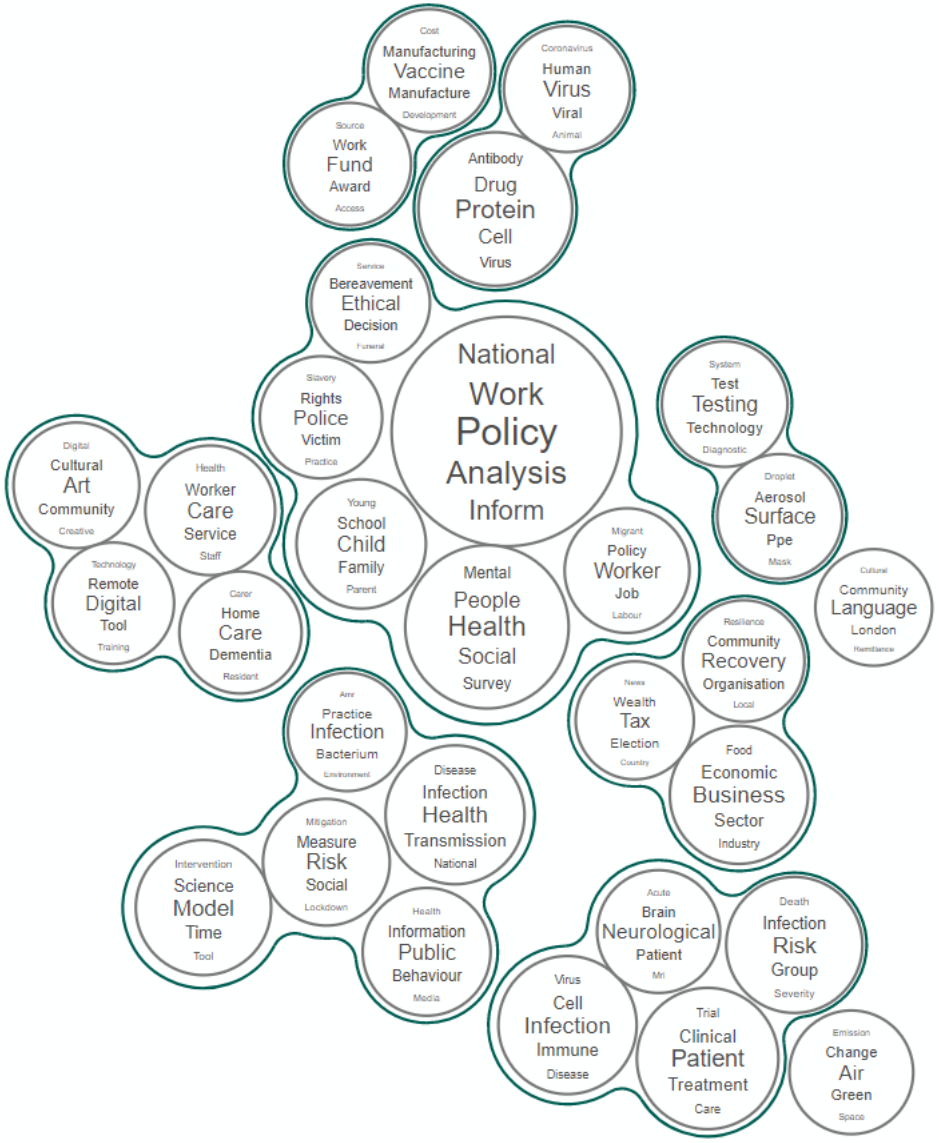
Green Data

Covid19 has acted as a digital catalyst



Key changes to ways of working in 2020:

- More agile and less bureaucratic funding frameworks, delivered at pace
- More multidisciplinary conversations
- Increased convergence of digital research infrastructure
- Reduced barriers to sharing data (a willingness to work toward a common purpose)
- Prototyping and testing of ideas



Examples:

- Covid19 and air quality — UK Centre for Ecology & Hydrology
- Reduced air traffic due to Covid19: environmental impacts — University of Oxford
- Rapid detection of the role of Covid19 on UK greenhouse gas emissions — University of Bristol
- Extension of the Breath-London air quality network into the Covid19 post-lockdown and recovery periods — University of Cambridge
- Improving Covid19 forecasts by accounting for seasonality and environmental responses — Imperial College London
- A UK-wide system for detecting coronavirus in wastewater — Prifysgol Bangor University

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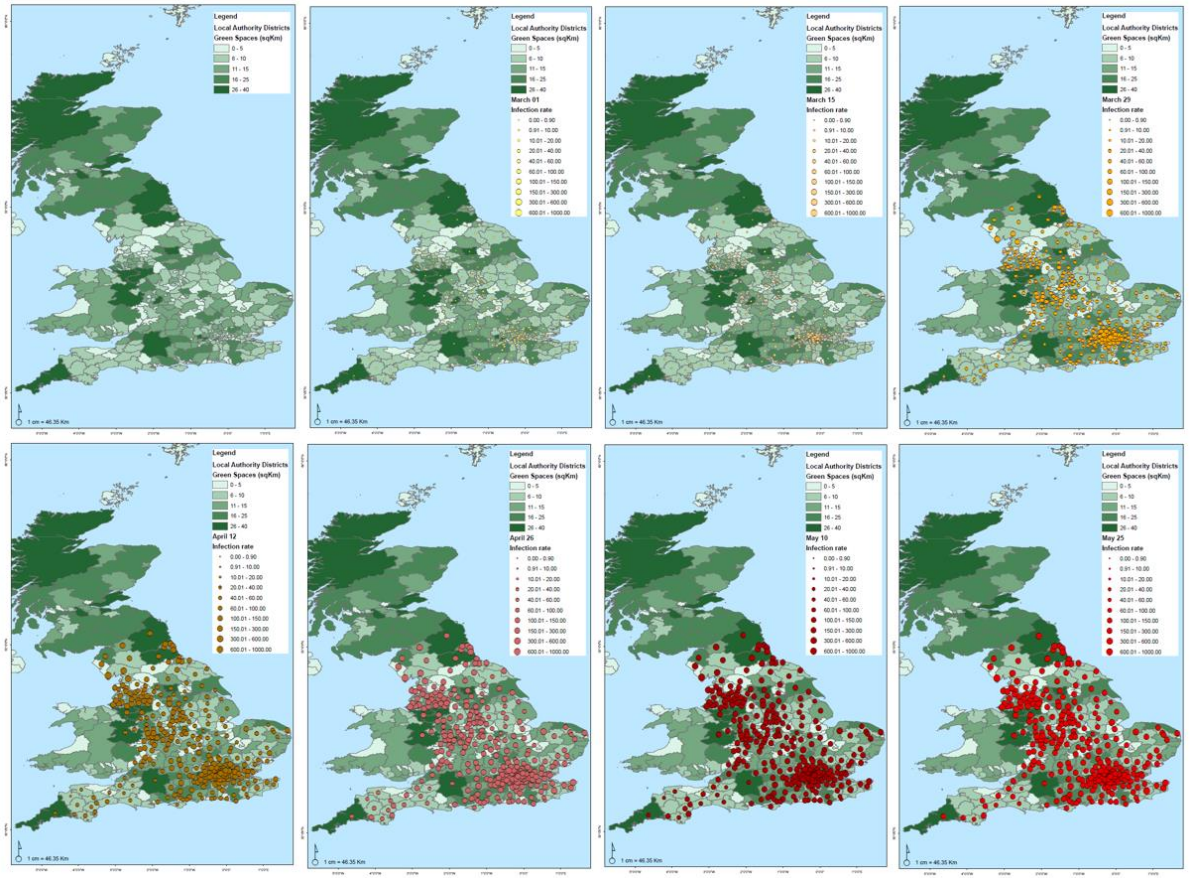
Digital Sprint

COVID-19 Ideathon and Hackathons

- An Ideathon was held on the 7th May 2020, followed by four successive virtual hackathons were run between 1st June and 24th July 2020
- Entrants worked together or individually to draw from key NERC digital assets and datasets to explore the environmental impacts and consequences of COVID-19.
- **Awards of up to £3,000** for the solutions that best help us understand and address the impact of the pandemic.
- **Four key topics:**
  - Hackathon 1: Air Quality (1 week)
  - Hackathon 2: Recovery (1 week)
  - Hackathon 3: Ecosystem Services (1 week)
  - Hackathon 4: Visualising Risk (4 weeks)



https://digitalenvironment.org/home/covid-19-digital-sprint-hackathons/

Sarah Pyatt
GIS Team Leader
Mott MacDonald

MOTT MACDONALD

EIC Green Data

Sarah Pyatt

Environment GIS Team Leader,
Mott MacDonald

Environmental data

Reflecting on 2020 and looking ahead

1

Understand the challenges

2

Integration

Location data will be the unifying connection between things, systems, people and the environment

Geospatial_Strategy.pdf (publishing.service.gov.uk)

Environmental data

Reflecting on 2020 and looking ahead

1

Understand the challenges

2

Integration

3

Quality and value

Do we understand the value of data?

Environmental data

Reflecting on 2020 and looking ahead

1 **Understand the challenges**

2 **Integration**

3 **Quality and value**

4 **Collection methods**

Environmental data

Reflecting on 2020 and looking ahead

1 **Understand the challenges**

2 **Integration**

3 **Quality and value**

4 **Collection methods**

5 **How we share and communicate**

MOTT MACDONALD

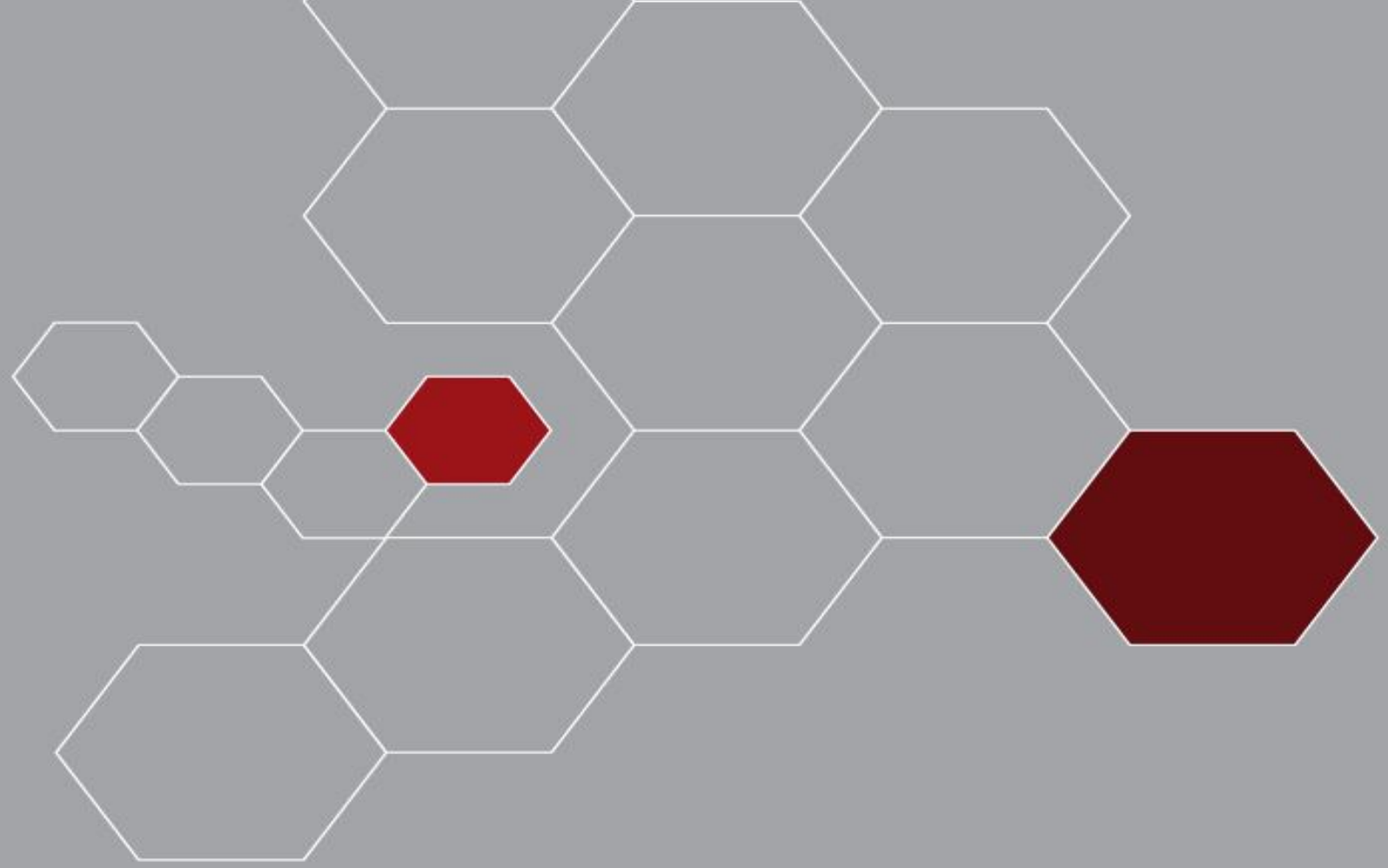
Thank you

IEMA - Digital Impact Assessment

Collaborating to beat COVID-19 - Mott MacDonald

Geospatial_Strategy.pdf (publishing.service.gov.uk)

Nigel Jones
Managing Director
Extrium



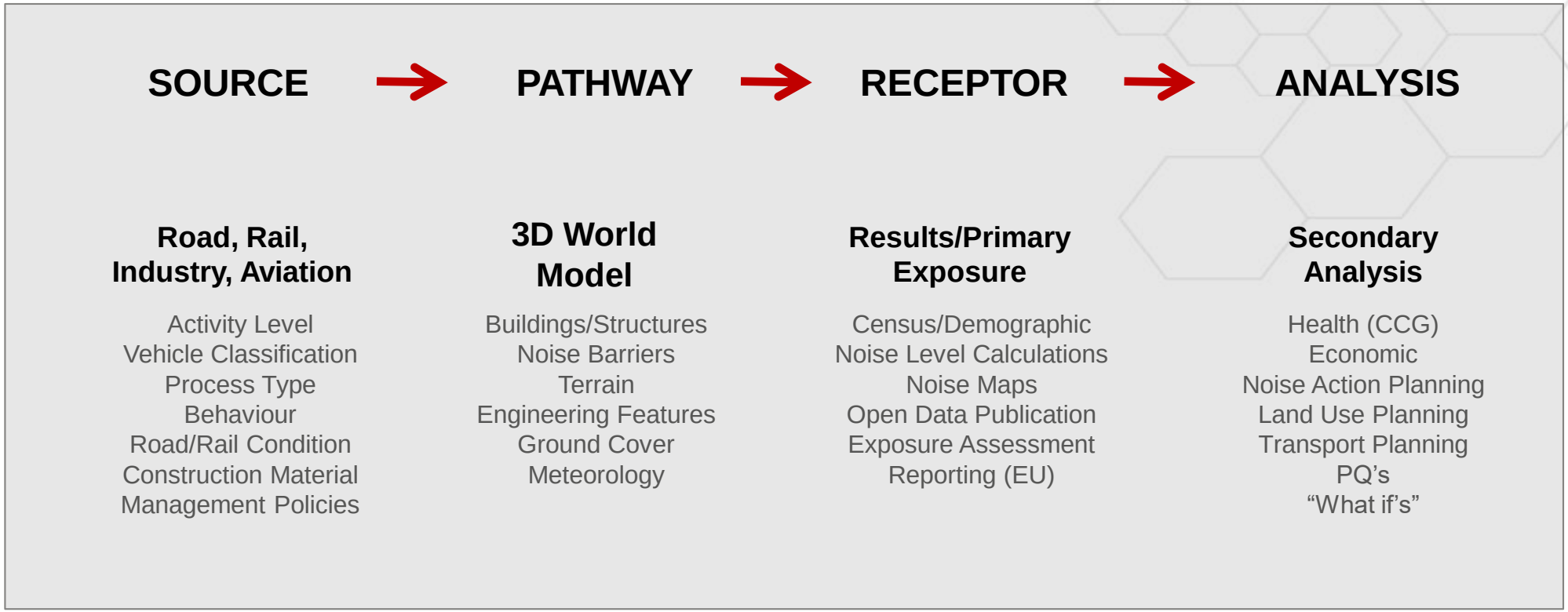
EIC Green Data webinars: COVID-19's impact on environmental data management
14 December 2020

National Noise Modelling and Health Analysis

Nigel Jones, Extrium

Extrium

Conceptual model and types of data



Data compatibility: by time period, geographical area, level of detail

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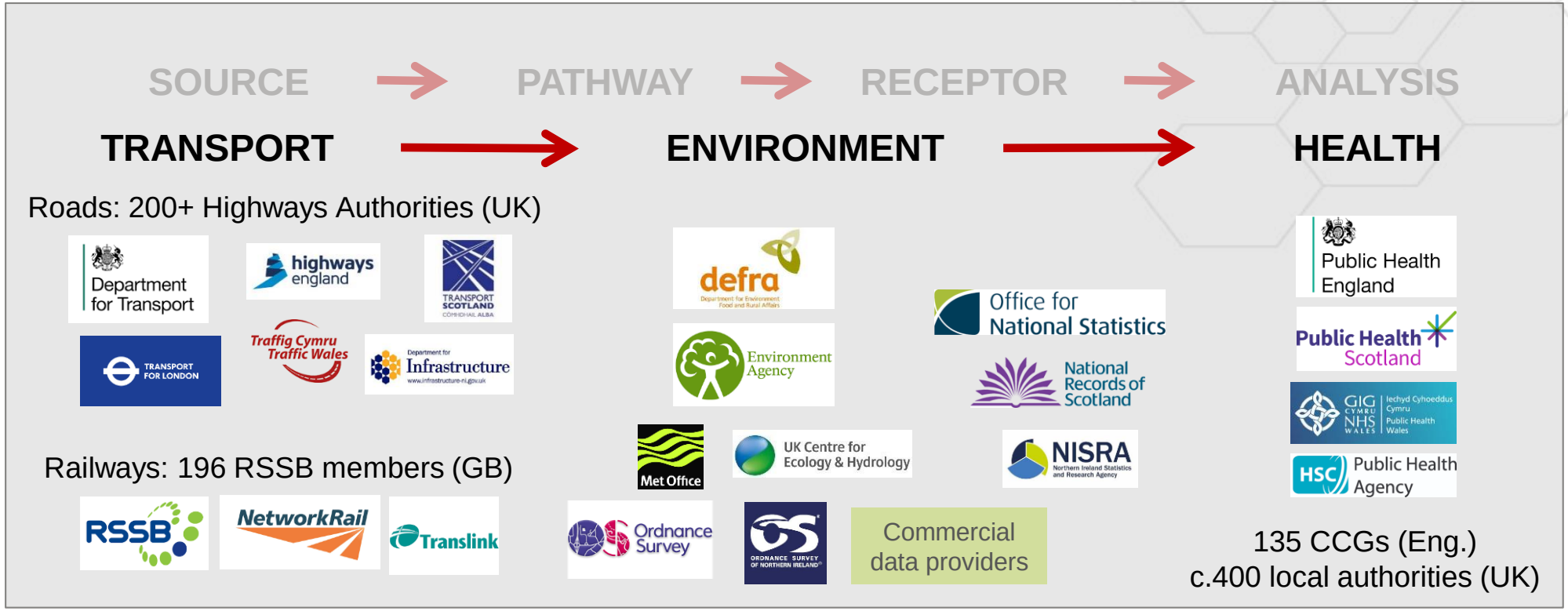
Data providers



Dependencies: digital project planning – agreements and data standards

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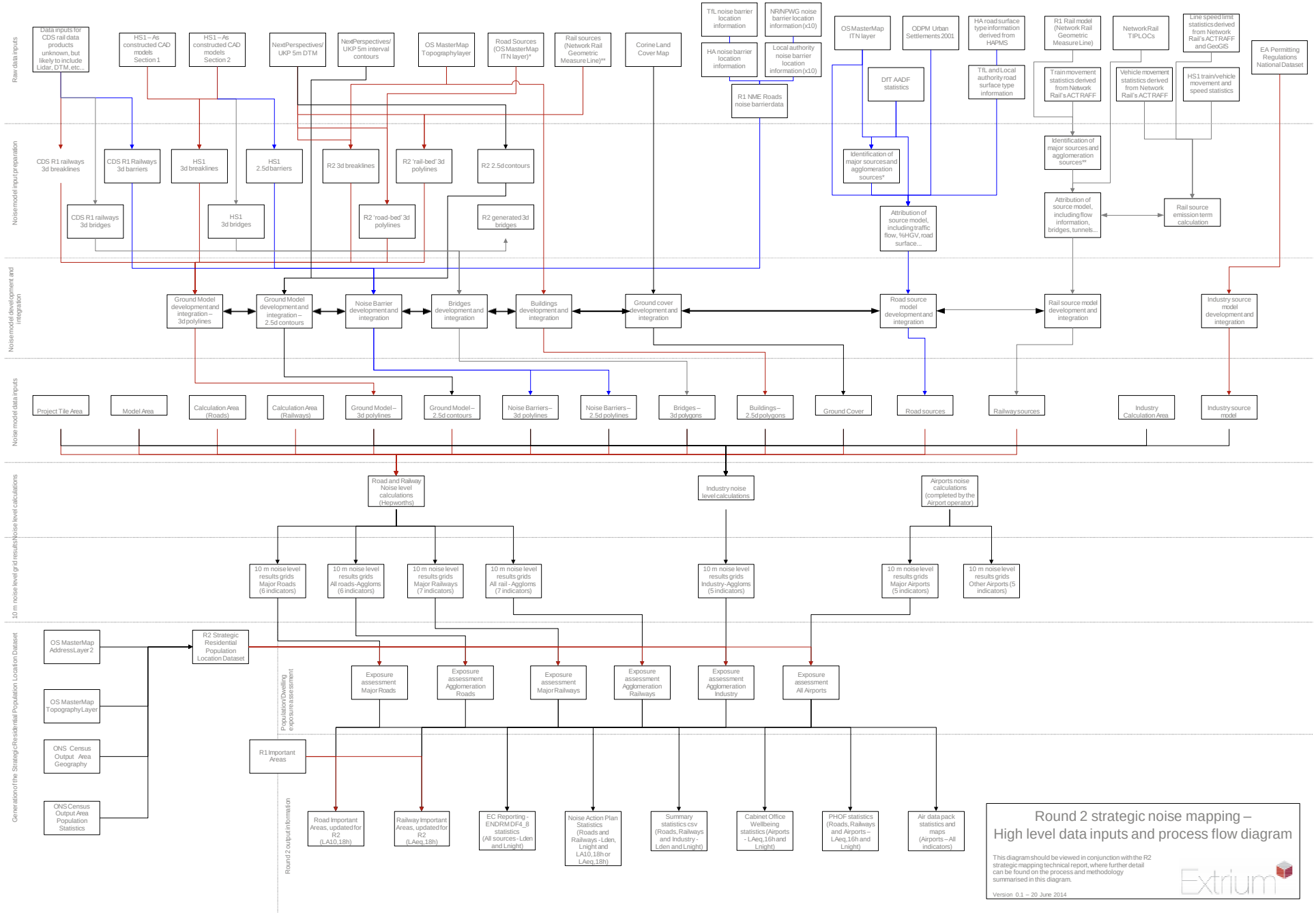
Raw data inputs
Noise model input preparation
Noise model development and integration
Noise model data inputs
Noise level calculations
10 m noise level grid results
Generation of the Strategic Residential Population Location Dataset
Data inputs for CDS rail data products unknown, but likely to include Lidar, DTM, etc...
HS1 – As constructed CAD models Section 1
HS1 – As constructed CAD models Section 2
NextPerspectives/ UKP 5m DTM
NextPerspectives/ UKP 5m interval contours
OS MasterMap Topography layer
Road Sources (OS MasterMap ITN layer)*
Rail sources (Network Rail Geometric Measure Line)**
Corine Land Cover Map
TfL noise barrier location information
NR/NPWG noise barrier location information (x10)
HA noise barrier location information
Local authority noise barrier location information (x10)
R1 NME Roads noise barrier data
OS MasterMap ITN layer
ODPM Urban Settlements 2001
HA road surface type information derived from HAPMS
R1 Rail model (Network Rail Geometric Measure Line)
NetworkRail TIPLOCs
Line speed limit statistics derived from Network Rail's ACTRAFF and GeoGIS
EA Permitting Regulations National Dataset
DfT AADF statistics
TfL and Local authority road surface type information
Train movement statistics derived from Network Rail's ACTRAFF
Vehicle movement statistics derived from Network Rail's ACTRAFF
HS1 train/vehicle movement and speed statistics
CDS R1 railways 3d breaklines
CDS R1 Railways 3d barriers
HS1 3d breaklines
HS1 2.5d barriers
R2 3d breaklines
R2 'rail-bed' 3d polylines
R2 2.5d contours
Identification of major sources and agglomeration sources*
Identification of major sources and agglomeration sources**
CDS R1 railways 3d bridges
HS1 3d bridges
R2 'road-bed' 3d polylines
R2 generated 3d bridges
Attribution of source model, including traffic flow, %HGV, road surface...
Attribution of source model, including flow information, bridges, tunnels...
Rail source emission term calculation
Ground Model development and integration – 3d polylines
Ground Model development and integration – 2.5d contours
Noise Barrier development and integration
Bridges development and integration
Buildings development and integration
Ground cover development and integration
Road source model development and integration
Rail source model development and integration
Industry source model development and integration
Project Tile Area
Model Area
Calculation Area (Roads)
Calculation Area (Railways)
Ground Model – 3d polylines
Ground Model – 2.5d contours
Noise Barriers – 3d polylines
Noise Barriers – 2.5d polylines
Bridges – 3d polygons
Buildings – 2.5d polygons
Ground Cover
Road sources
Railway sources
Industry Calculation Area
Industry source model
Road and Railway Noise level calculations (Hepworths)
Industry noise level calculations
Airports noise calculations (completed by the Airport operator)
10 m noise level results grids Major Roads (6 indicators)
10 m noise level results grids All roads-Aggloms (6 indicators)
10 m noise level results grids Major Railways (7 indicators)
10 m noise level results grids All rail - Aggloms (7 indicators)
10 m noise level results grids Industry-Aggloms (5 indicators)
10 m noise level results grids Major Airports (5 indicators)
10 m noise level results grids Other Airports (5 indicators)
OS MasterMap AddressLayer 2
OS MasterMap Topography Layer
ONS Census Output Area Geography
ONS Census Output Area Population Statistics
R2 Strategic Residential Population Location Dataset
Population/Dwelling exposure assessment
Exposure assessment Major Roads
Exposure assessment Agglomeration Roads
Exposure assessment Major Railways
Exposure assessment Agglomeration Railways
Exposure assessment Agglomeration Industry
Exposure assessment All Airports
R1 Important Areas
Round 2 output information
Road Important Areas, updated for R2 (LA10,18h)
Railway Important Areas, updated for R2 (LAeq,16h)
EC Reporting - ENDRMDF4_8 statistics (All sources - Lden and Lnight)
Noise Action Plan Statistics (Roads and Railways - Lden, Lnight and LA10,18h or LAeq,16h)
Summary statistics csv (Roads, Railways and Industry - Lden and Lnight)
Cabinet Office Wellbeing statistics (Airports - LAeq,16h and Lnight)
PHOF statistics (Roads, Railways and Airports – LAeq,16h and Lnight)
Air data pack statistics and maps (Airports – All indicators)
Round 2 strategic noise mapping – High level data inputs and process flow diagram
This diagram should be viewed in conjunction with the R2 strategic mapping technical report, where further detail can be found on the process and methodology summarised in this diagram.
Version 0.1 – 20 June 2014
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What has COVID-19 shown us?

- Need for standardised access to authoritative local data
  - e.g. traffic data, assets
- Importance of a common evidence base
  - enables a consistent local and nation picture
- Need data at a greater level of detail
  - spatial and temporal resolution
- Importance of accuracy and speed of analysis

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Challenges and opportunities

- Managing (sharing) data between authorities
  - between national and local government
  - between user communities (noise, AQ, climate)
- Different levels of detail for different applications
  - requirements - need to define the question(s) at the outset
  - data ‘ecosystem’ - data standards
- Organisational – projects/programmes are complex to manage
  - need for dialogue between organisations
  - importance of vision and leadership

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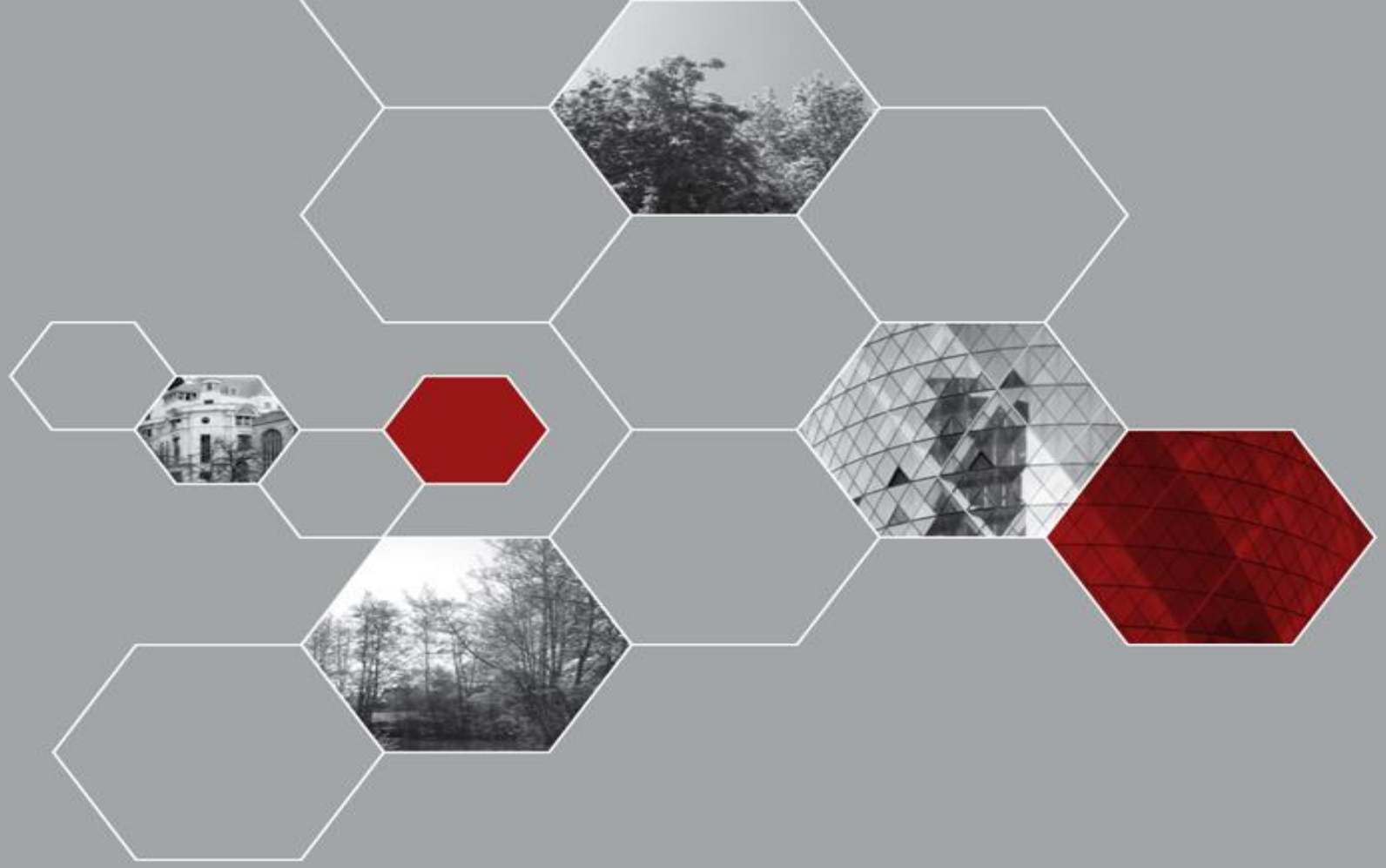

Thank you

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Kevin Turpin
Technical Director
Jacobs

Green (Big) Data, COVID & Local Air Quality?

In the Battle Against Air Pollution, Big Data is Winning

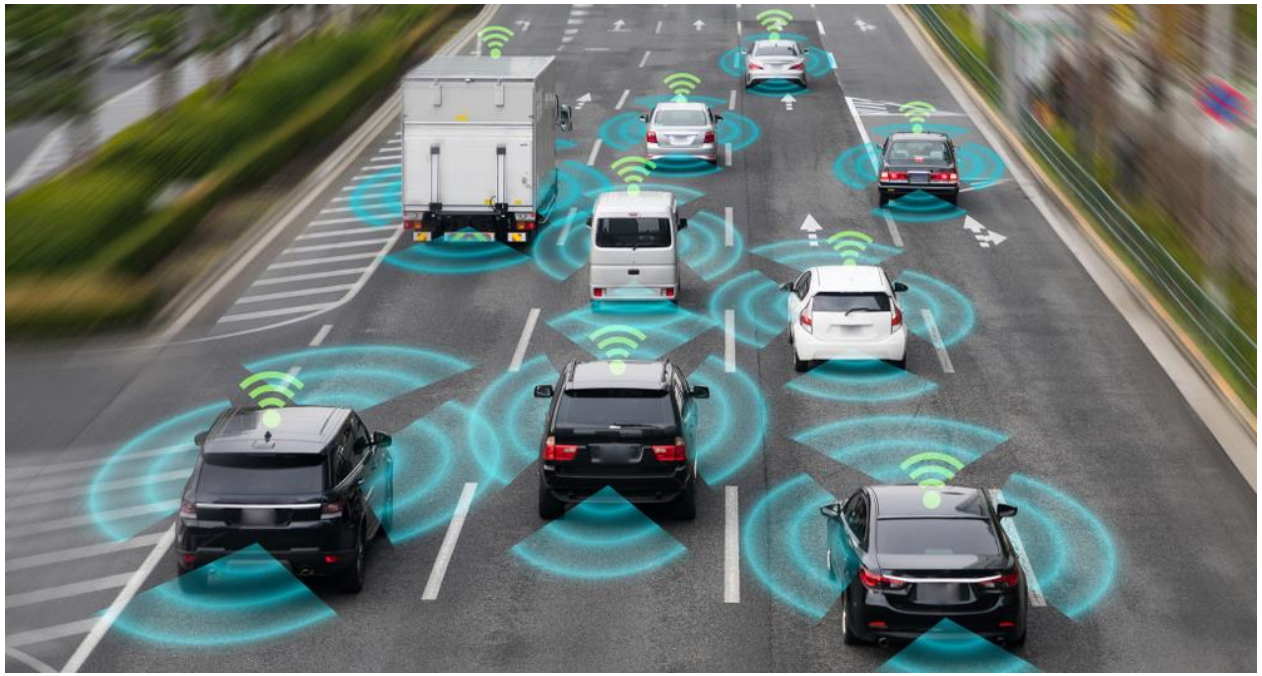
Andrew Wooden, Technology Writer

Not so sure…….

Sources of Green (big) data and considerations

Sources

- Mobile phones
- Parking bay sensors
- Traffic junction and flow measuring devices
- Smart car
- CCTV image analysis



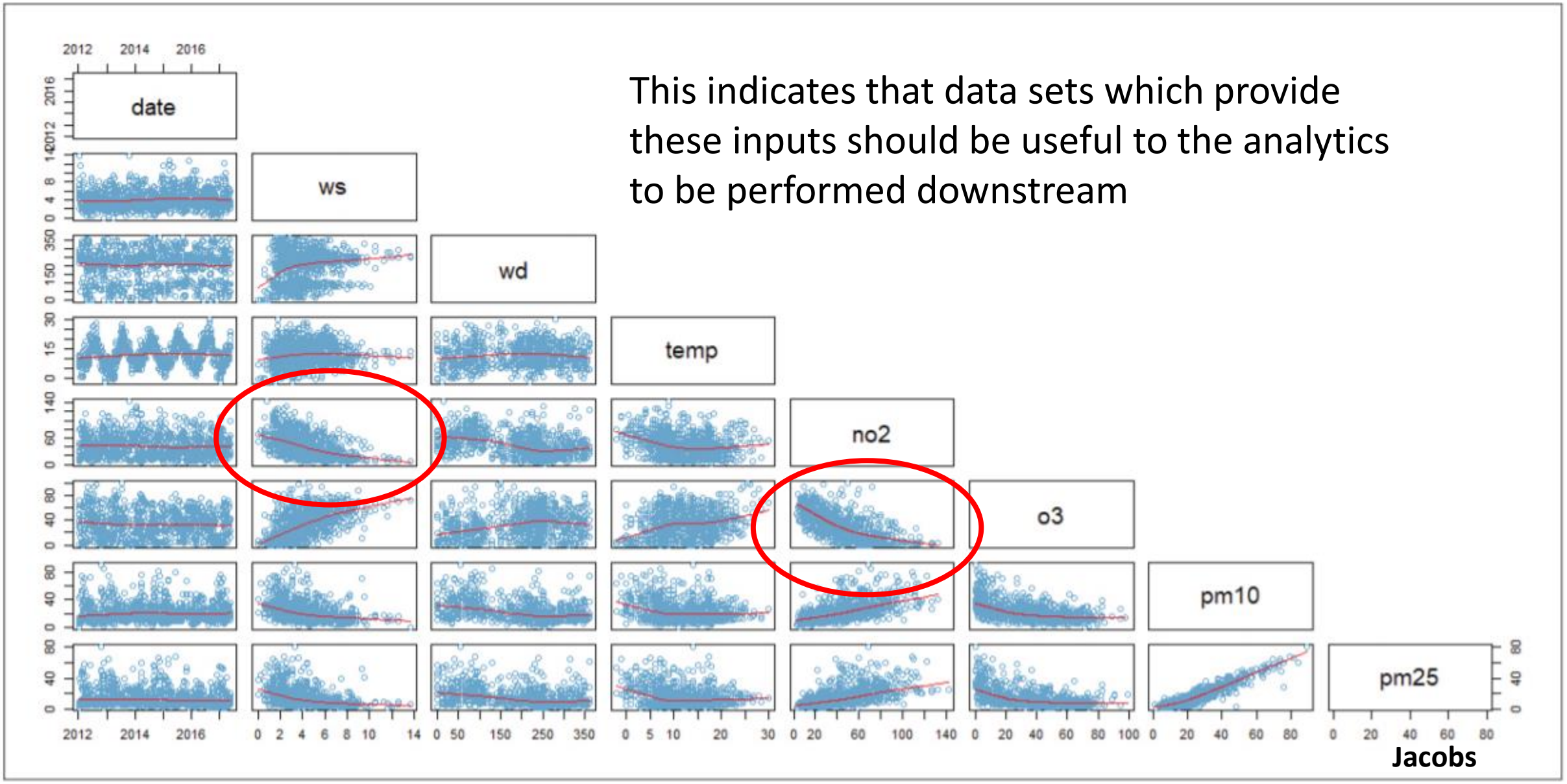
Considerations;

- Spatially resolved
- Open and Paid data sources
- Data pre-processing
- Data cleaning
- Data transformation/consolidation
- Machine learning

The question is important

- Loads of data but no real sense of what the question is?
- Are we expecting “green/big data” to manifest solutions via machine learning?
- What's proportionate to the scale of the problem?
- What other factors confound air quality management such as COVID?

What data are typically used for air quality analysis?



This indicates that data sets which provide these inputs should be useful to the analytics to be performed downstream

How data are used to understand the implications of COVID (real time)

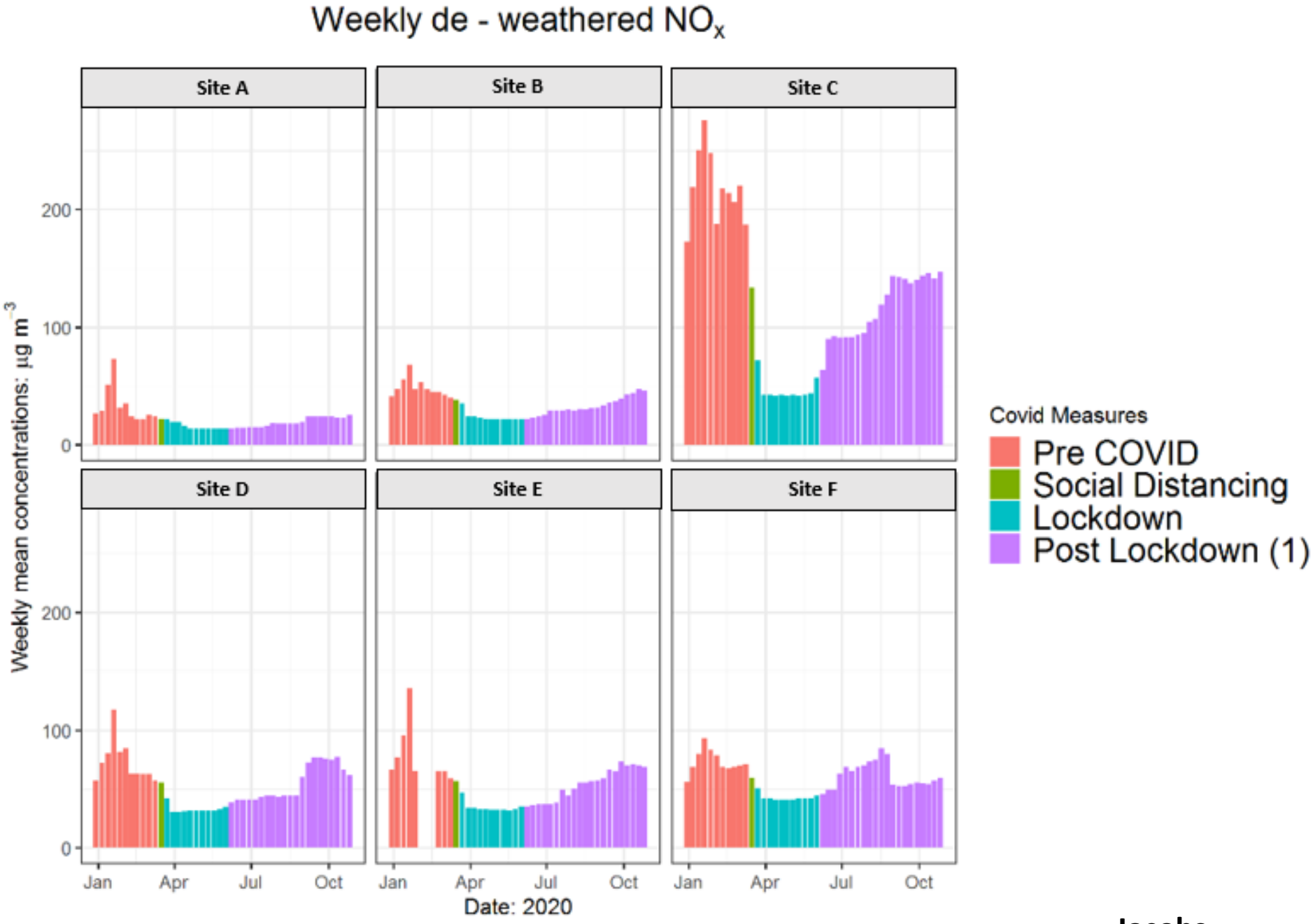


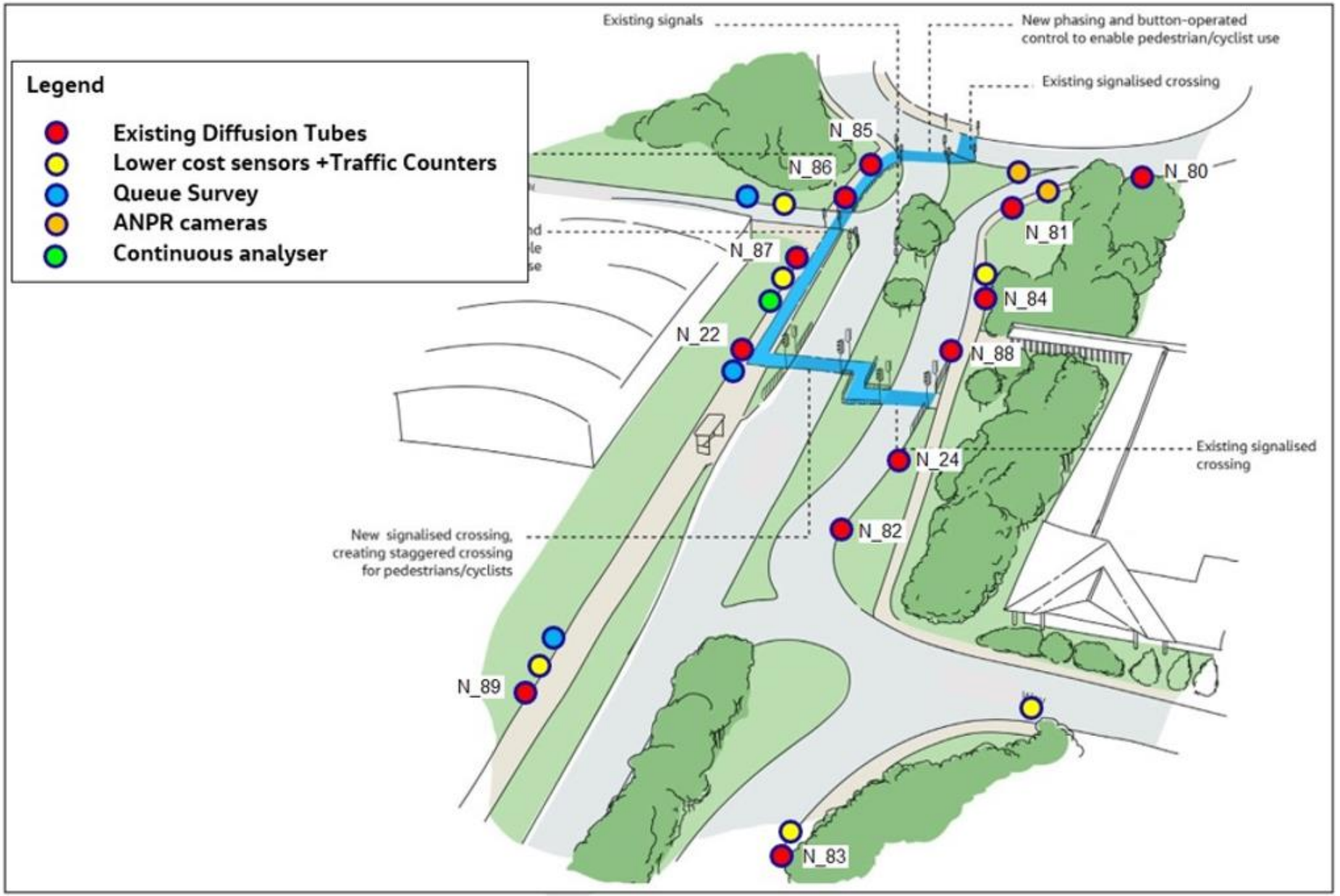
Fig. 10. Predicted weekly mean NOx and NO2: De - weathered predictions

Jacobs

What data sources are used at the moment?

Is there scope for big data to improve our understanding?

Perhaps we need to better harvest existing data?



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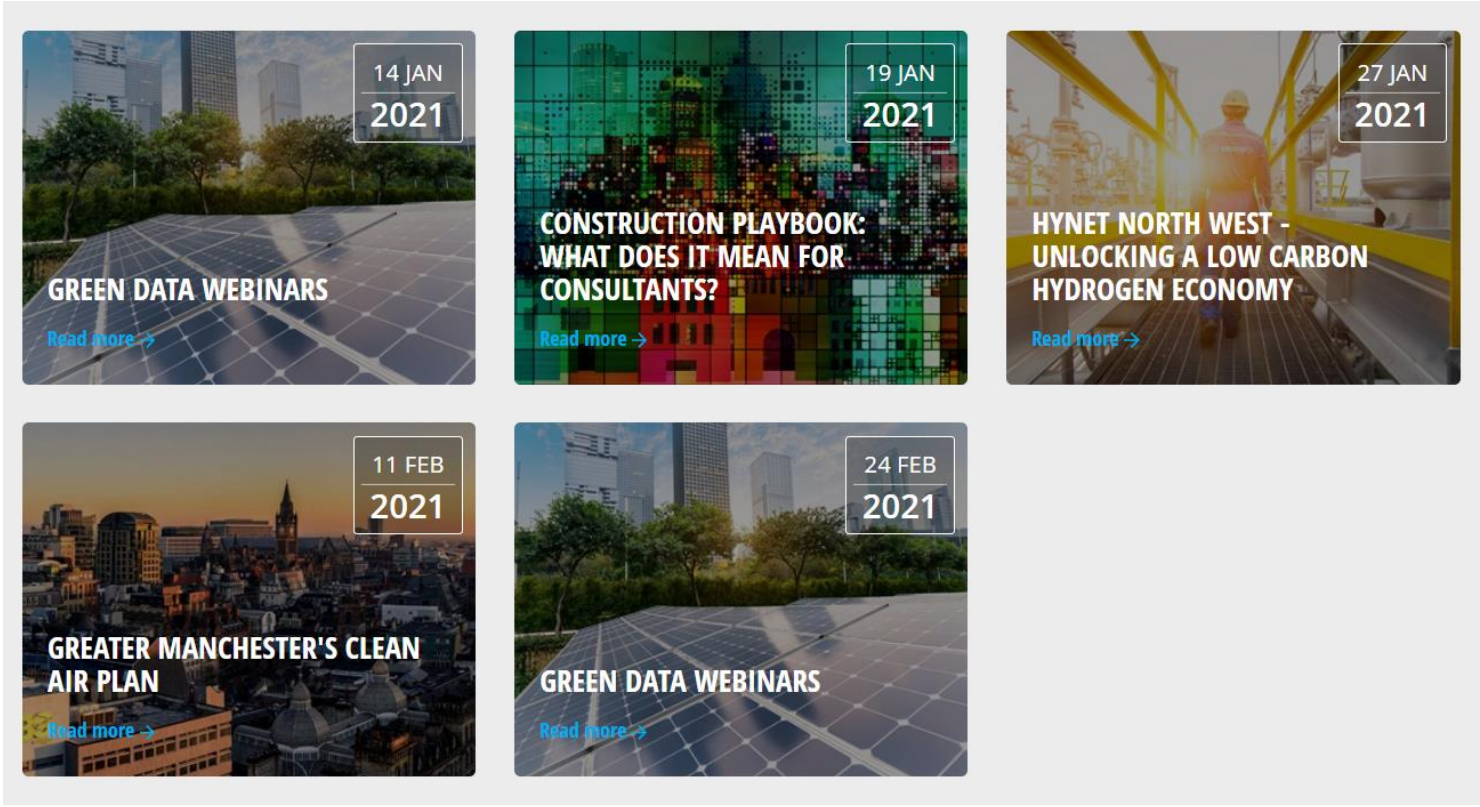
Upcoming webinars



Find out more and register here.