

ORDNANCE SURVEY

# Sustaining the digital economy with reliable, timely and quality natural and built environment information

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30 April 2019



# Why does Ordnance Survey exist? To underpin Britain



Better decision making | Value to the economy | Better government services



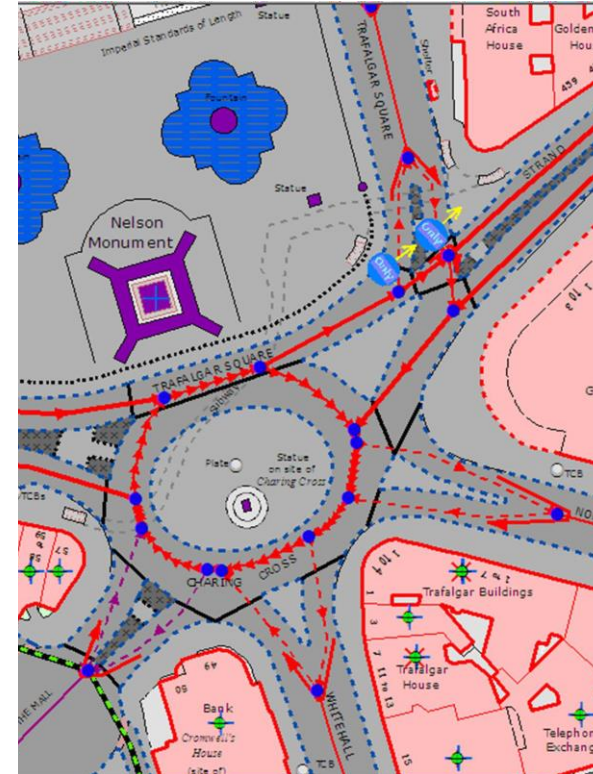
# How Ordnance Survey does it?



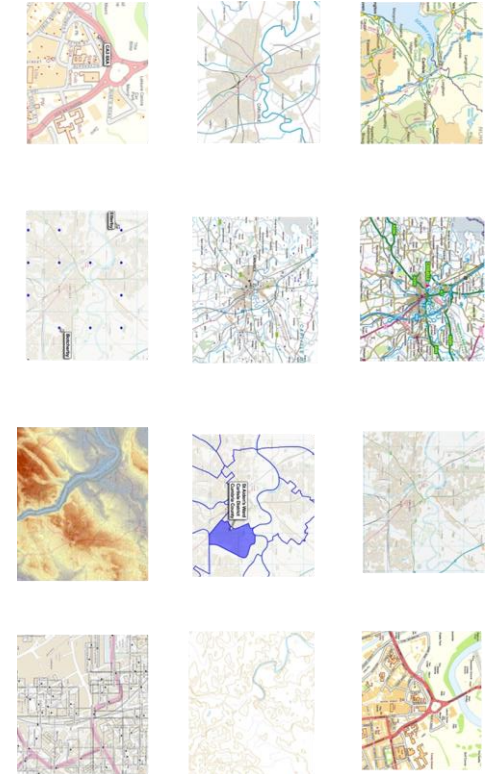
Real World changes



Collect changes



Manage database

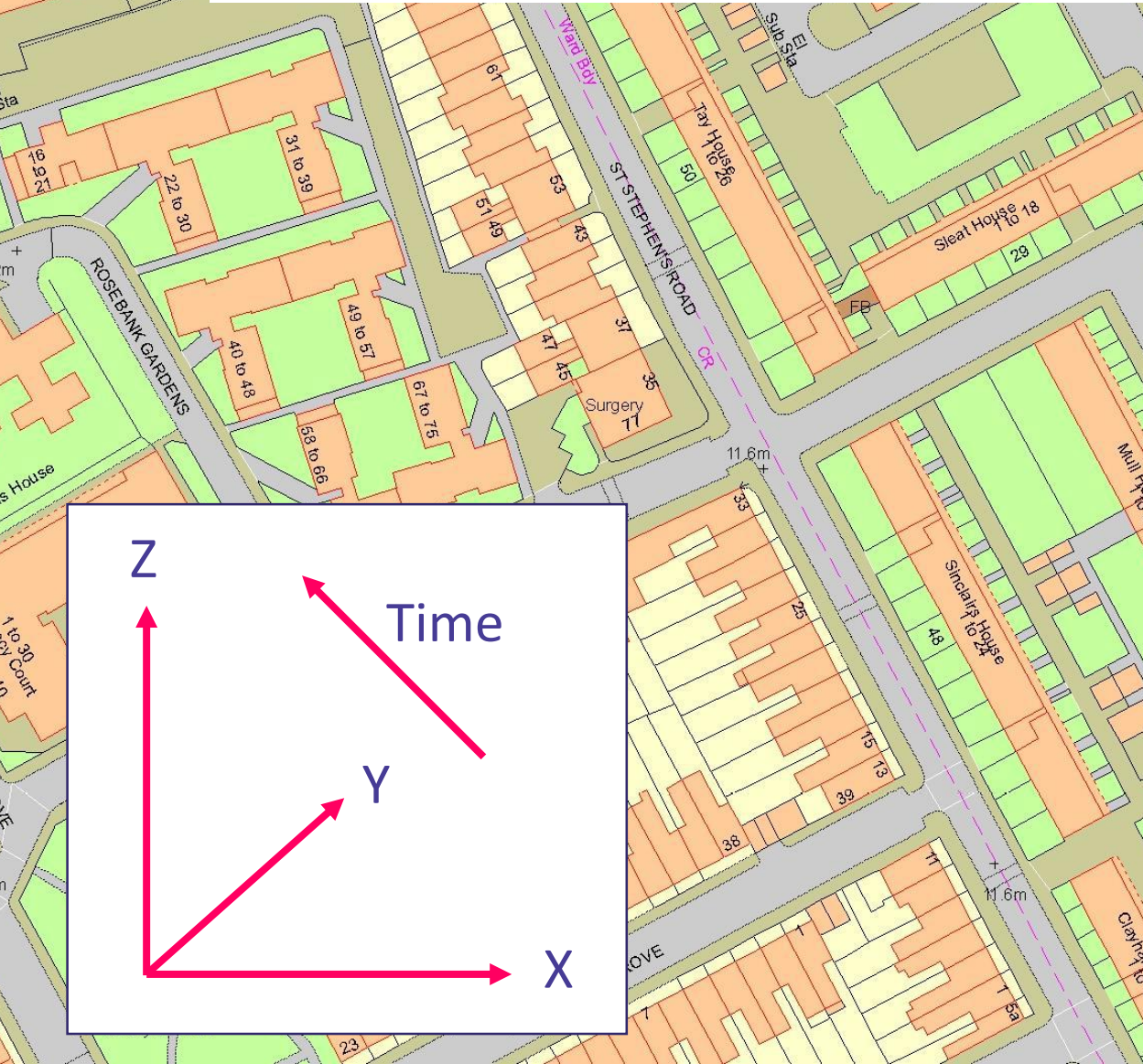


Products and service

New techniques and increasing automation ensure accuracy, timeliness, currency, quality and trust



# Time and Place – the 4<sup>th</sup> dimension is critical





# Address, a powerful integrator

But there is a problem.....

- Planning Dept = Flat 1, 21 Ash Grove London NW2 3LN
- Utility = 21A Ash Grove London NW2
- Land tax = Flat 1, 21 Ash Gr. London NW2 3LM
- Fire = 21A Ash Grove, Cricklewood
- Local Municipality = Flat 1 21 Ash Grove

Solution:

- Unique property identifier used by all agencies

Apartment 1<sup>st</sup> floor right UPRN1000045233

Apartment 1<sup>st</sup> floor left UPRN1000045231

Multi-family residential building UPRN1000045234



# United Nations Fundamental Geospatial Data Themes



Global Geodetic Reference Frame



Geographical Names



Addresses



Functional Areas



Buildings and Settlements



Land Parcels



Transport Networks



Elevation and Depth



Population Distribution



Land Cover and Land Use



Geology and Soils



Physical Infrastructure



Water



Orthoimagery

# Evidence that good data creates wealth

*UK: potential \$8-14 billion per annum economic value from private sector adoption of geospatial data. Particularly: Retail and logistics, Property and land, Infrastructure and construction, Mobility, Natural resources*

According to the McKinsey Global Institute, cross-border flows of data grew 45 times from 2005 to 2014, and accounted for \$2.8 trillion (approx. 3.3%) of global GDP in 2014.

European Commission calculating that “even limited use of big data analytics solutions by the top 100 EU manufacturers could boost EU economic growth by an additional 1.9% by 2020.”

# UK Government has identified the key geospatial areas where UK can unlock economic value

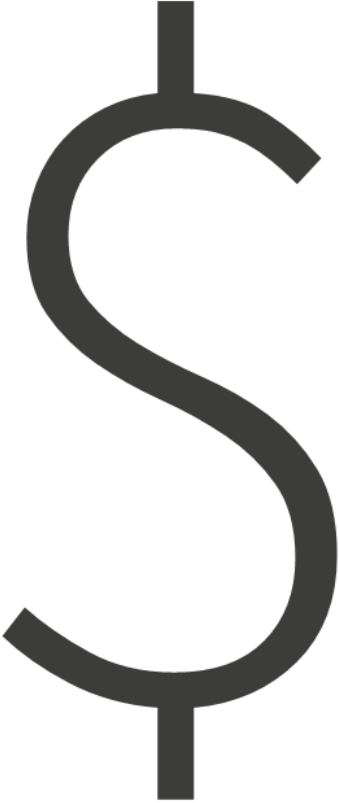
- Analysis has identified a potential **\$8-14 billion per annum** economic value from better use and adoption of geospatial data.
- This identified five key sectors where the highest latent value was:
  - Retail and logistics
  - Property and land
  - Infrastructure and construction
  - Mobility
  - Natural resources
- Establishment of a Geospatial Commission to unlock this value.



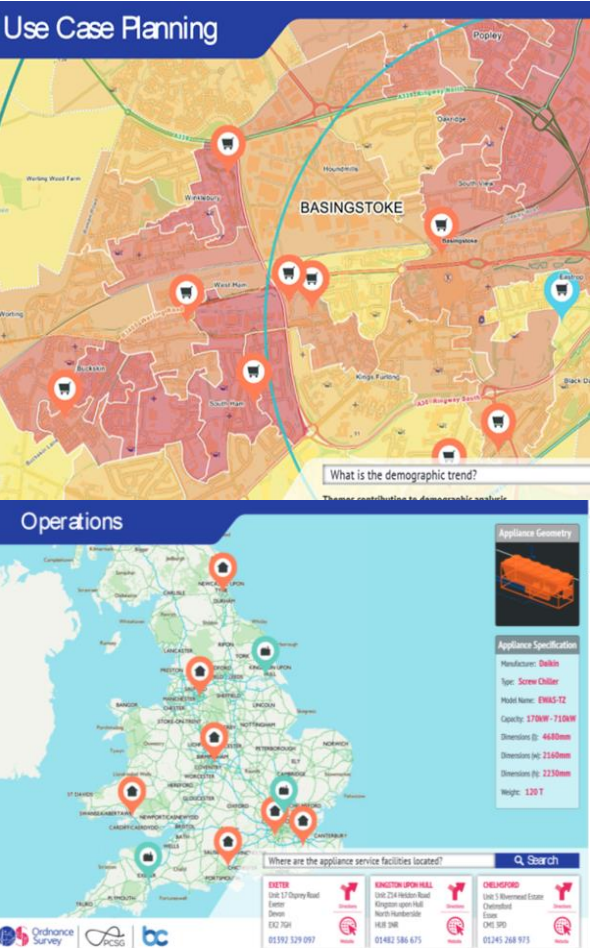
# Business expectation



Efficiency

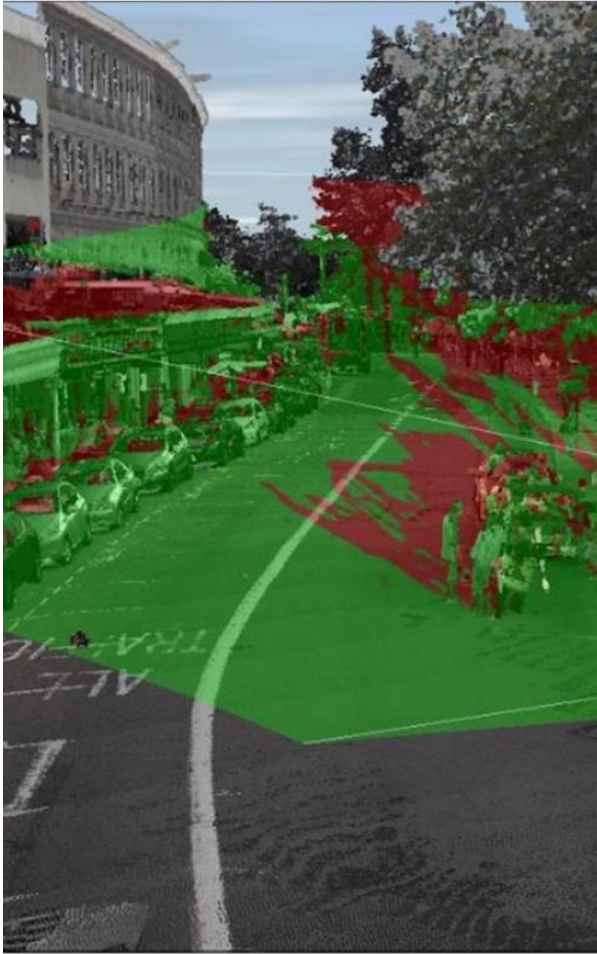


Profit



Answers

Competitive advantage

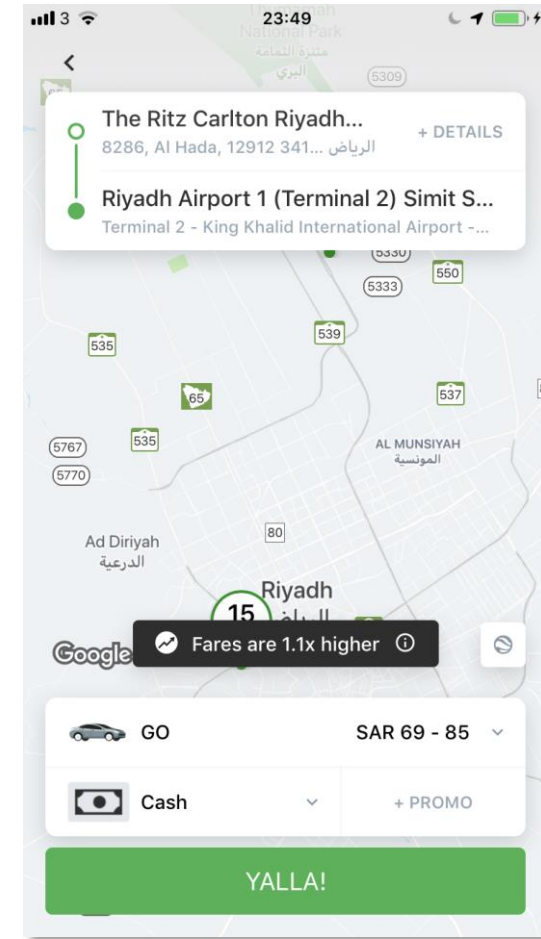




# Citizens expectation



Esperance, 39, a mother of four used to be in constant dispute with her neighbours over ownership of the land she lived on. Through a DFID-funded land registration programme, the dispute is now settled and she is a proud landowner.



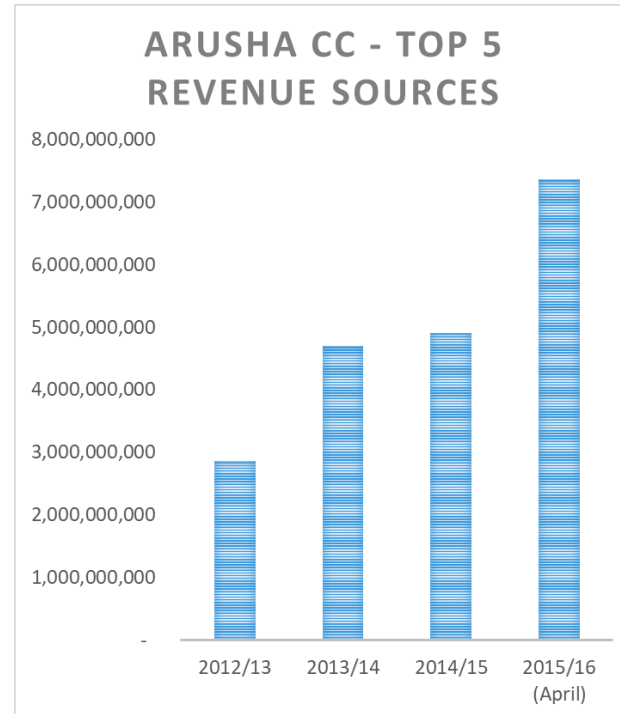
Maslow's hierarchy of needs



# Government expectation



Integrated data



World Bank Land and Property Conference 2017. The role of ICT in delivering efficient revenue collection in developing countries: The Tanzanian experience. Prof William McCluskey, African Tax Institute, University of Pretoria, Chyi-Yun Huang, World Bank, Patrick Doherty, Consultant, Prof Riel Franzsen, African Tax Institute, University of Pretoria

Revenue

Public services, eg:

- Environmental management
- Emergency services
- Transport networks
- Housing and planning
- Citizen centric services

Services

## UNITED NATIONS E-GOVERNMENT SURVEY 2018

GEARING E-GOVERNMENT TO SUPPORT TRANSFORMATION TOWARDS SUSTAINABLE AND RESILIENT SOCIETIES



Respect/votes

# Digital Economy

Economy that is based on digital computing technologies, increasingly perceived as conducting business through markets based on the internet.

The Digital Economy is worth three trillion dollars today.

This is more than the GDP of the United Kingdom.





# Digital economy is more than e-commerce



BBC Sign in News Sport Weather iPlayer Sounds

## NEWS

Home UK World Business Politics Tech Science Health Family & Education

### Technology

## Dubai tests drone taxi service

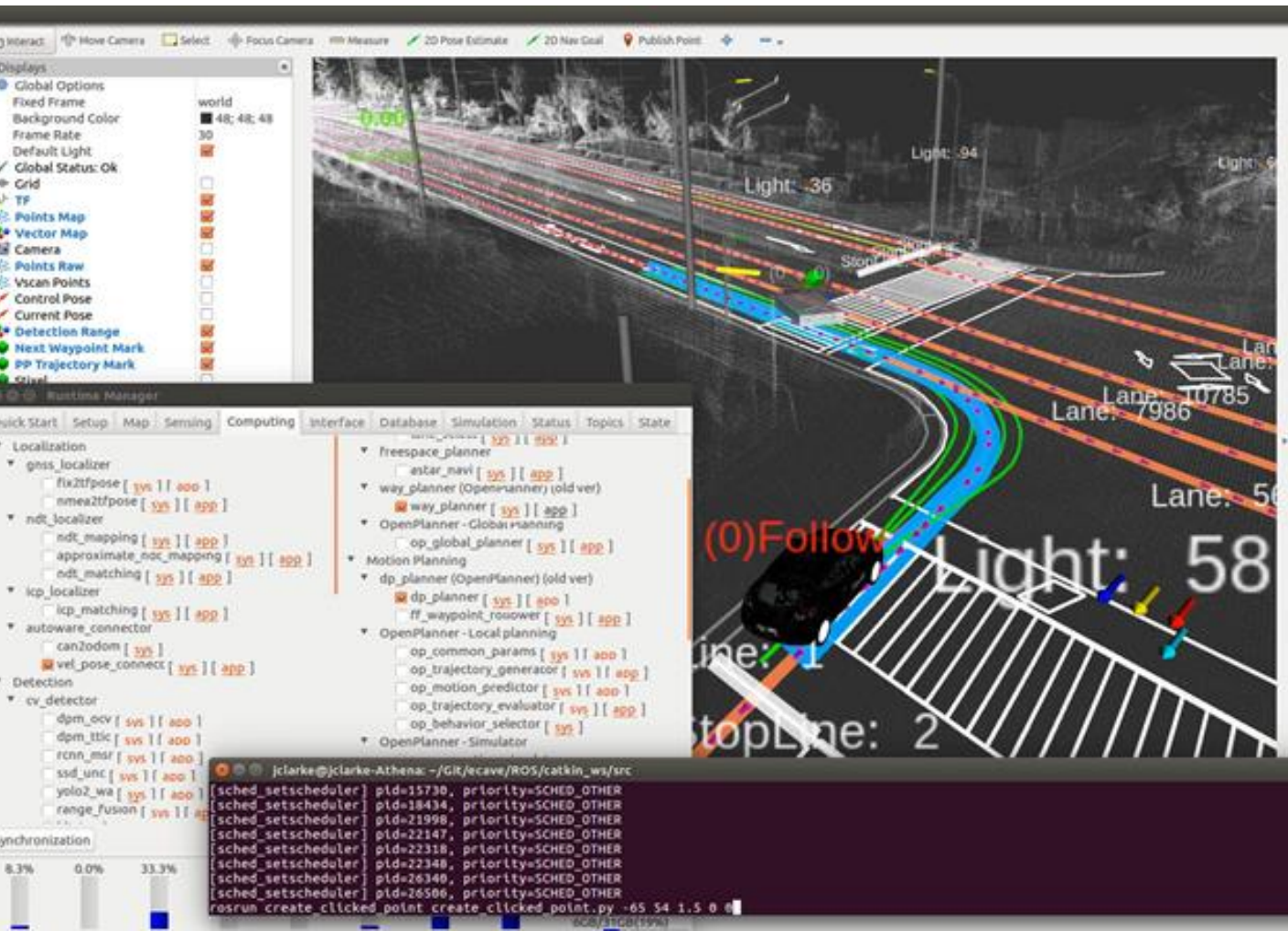
By Jane Wakefield  
Technology reporter

🕒 26 September 2017

[f](#) [📧](#) [🐦](#) [✉](#) [Share](#)



# 4<sup>th</sup> Industrial Revolution: automation and IoT



## UK national digital twin:

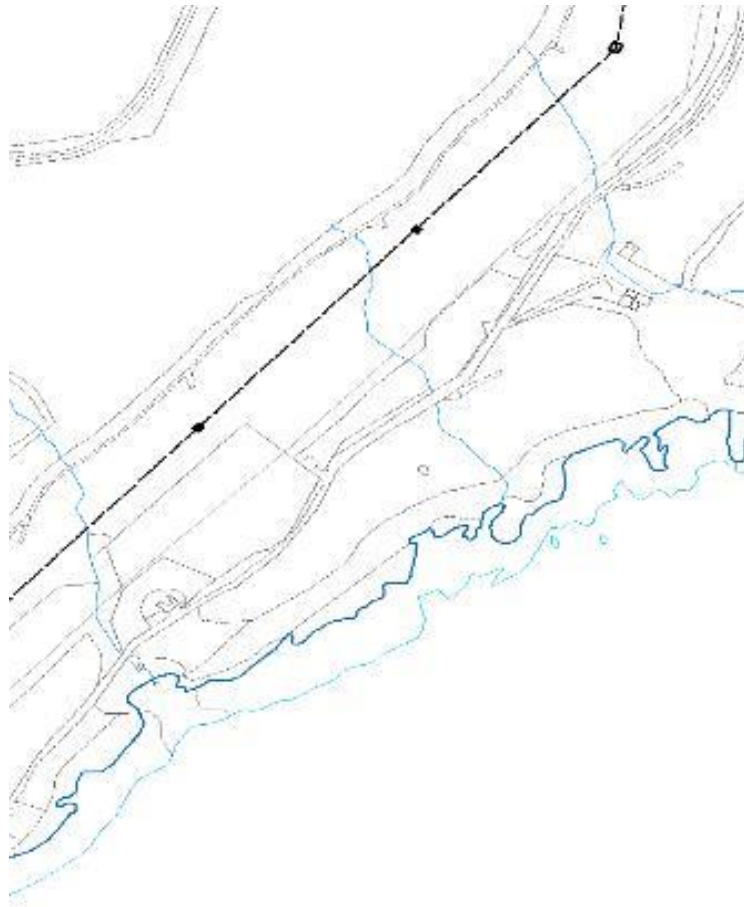
- A detailed 4-D digital version of the real world: indoors, outdoors, above and below ground.
- Machine readable.
- Modelling, simulation and analytics.
- New industries and high value jobs



# Urban Navigation



# Cartography



Years

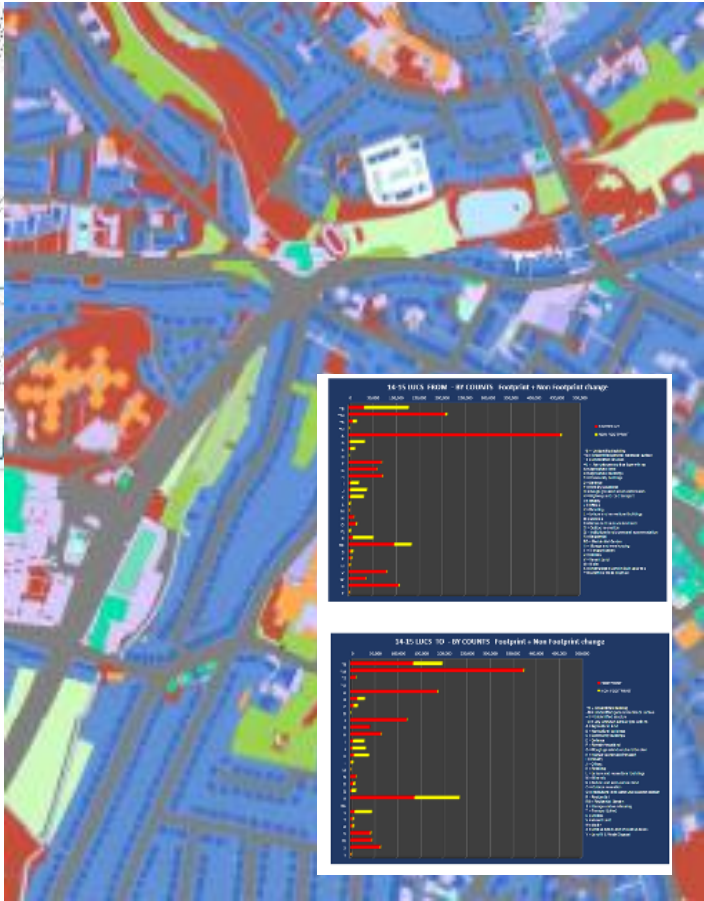
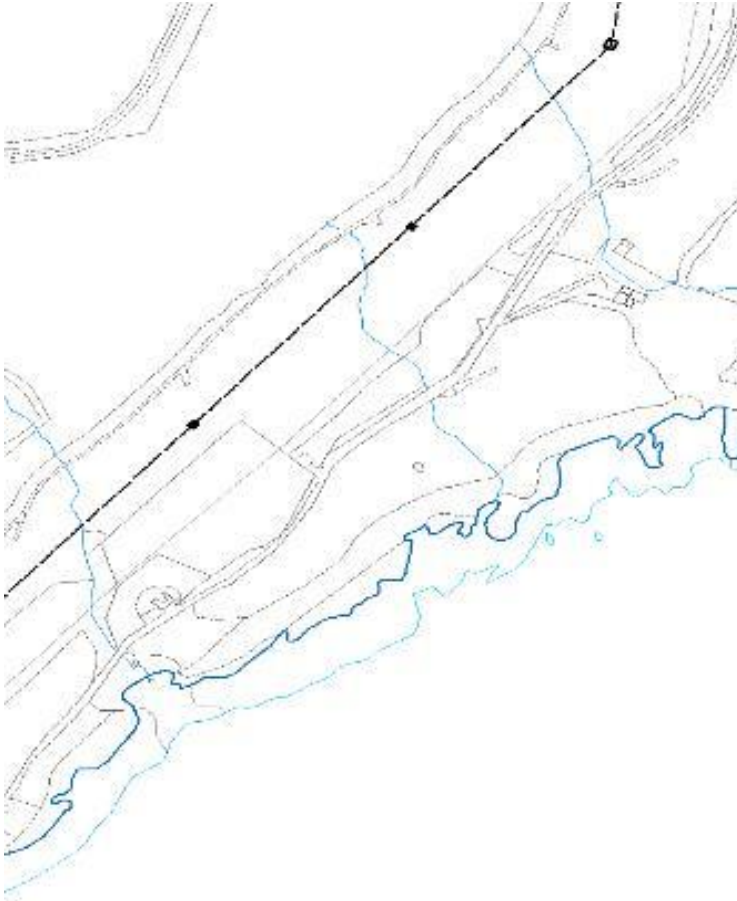
Data Currency  
Weeks

Seconds



# Cartography

# Data



Years

Data Currency  
Weeks

Seconds

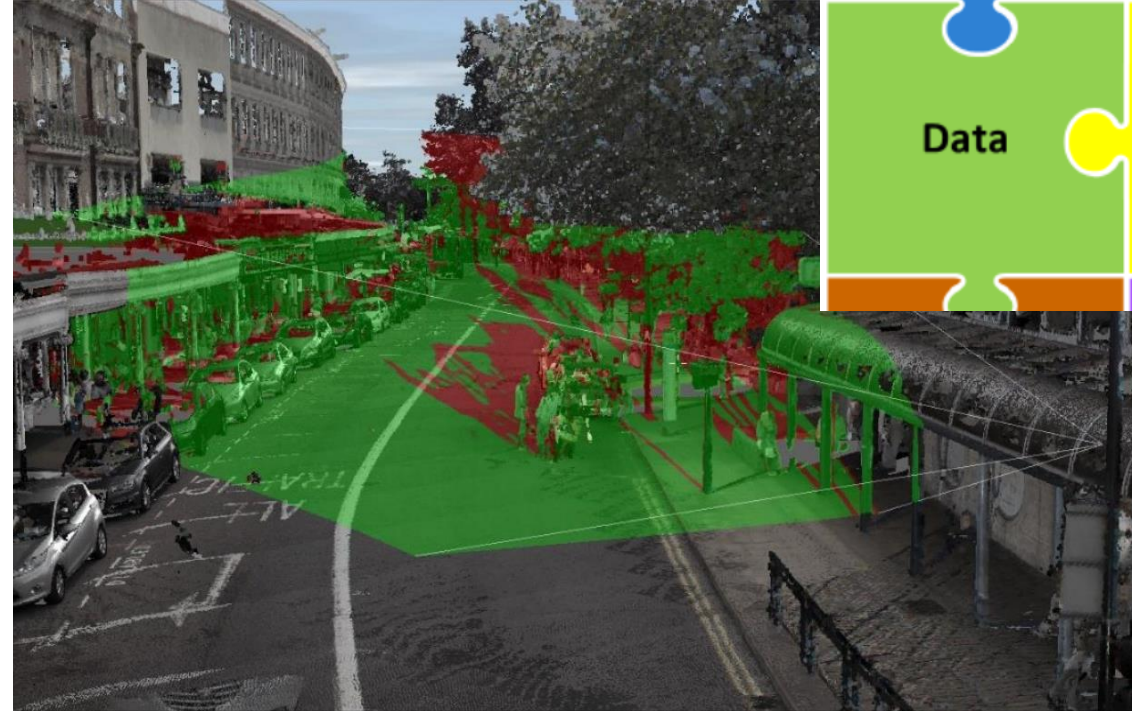
# Data:

## More –

- Uses
- Currency
- Accuracy
- Features
- Attribution
- Useable
- Answers

## Less -

- Cost





# Changing UK Policy – Open Data

## Soon to Include: Unique Property Reference Number (UPRN)

**Planning Dept**=Flat 1, 21 Ash Grove London NW2 3LN

**Police**=Ground Floor Flat, 21 Ash Grove London

**Utility**=21A Ash Grove London NW2

**Land tax**=Flat 1, 21 Ash Gr. London NW2 3LM

**Fire**=21A Ash Grove, Cricklewood

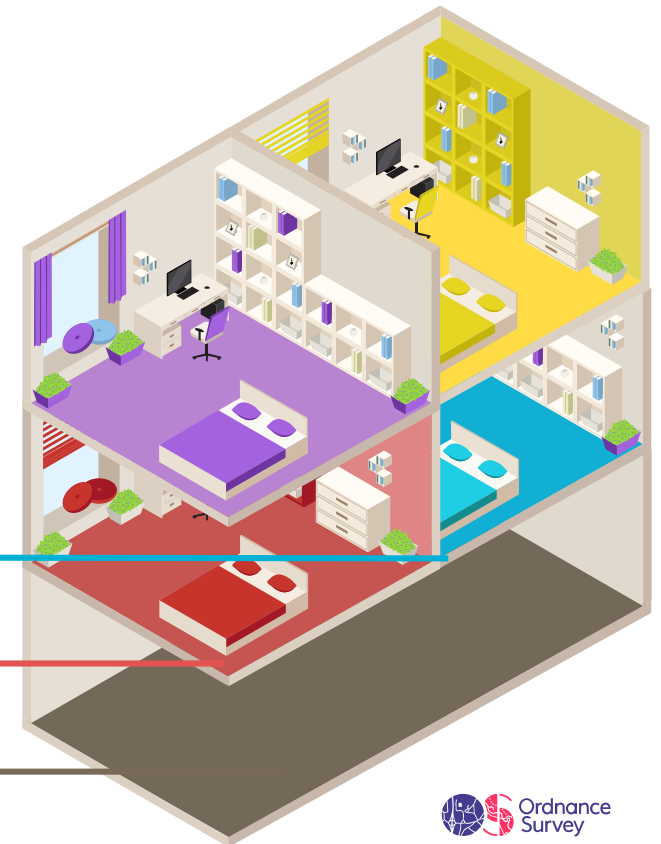
**Local Municipality**=Flat 1 21 Ash Grove

**Employment Dept**=Ground Floor Flat, Elm Grove & Ash Grove

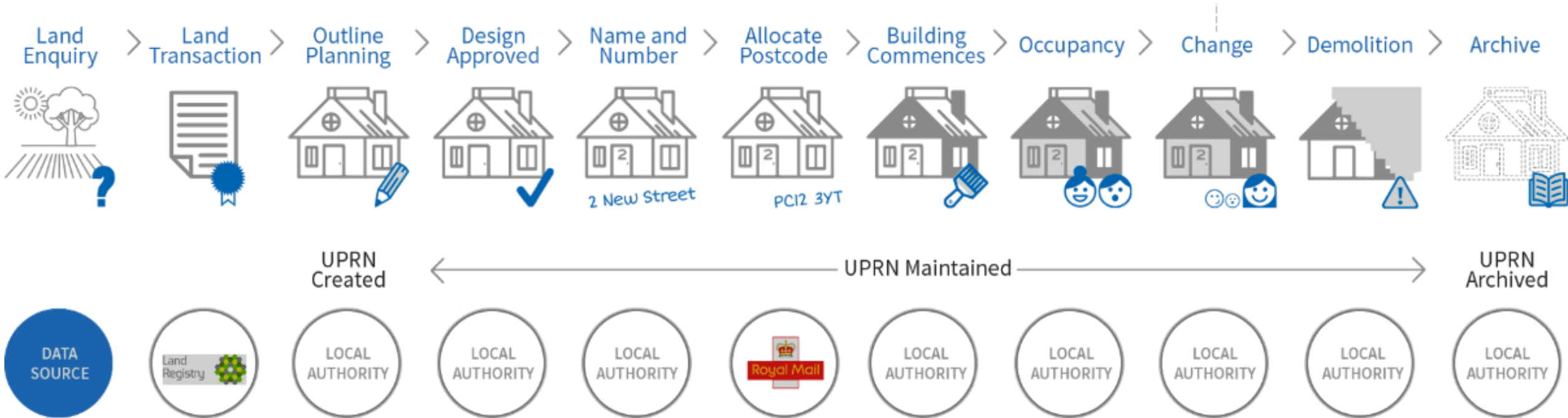
Apartment 1<sup>st</sup> floor right [UPRN1000045233](#)

Apartment 1<sup>st</sup> floor left [UPRN1000045231](#)

Multi-family residential building [UPRN1000045234](#)



# Use data science to gain more value from existing geospatial data assets



.....Customer access to 'core data'?



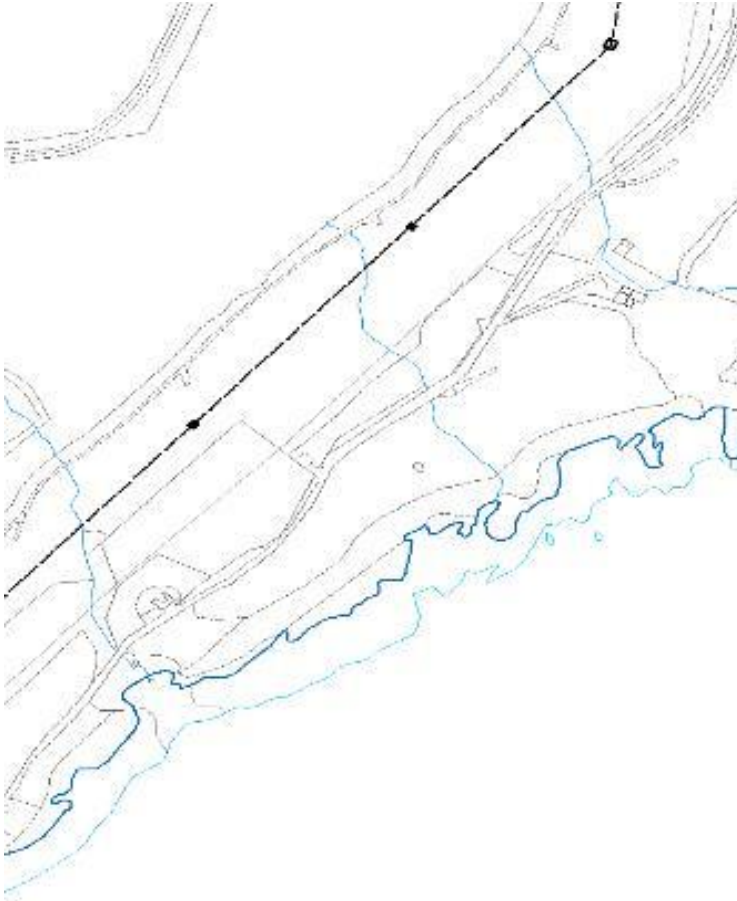
# Automation brings real-time data

- Deep Learning Techniques
- Object classification
- Image compression algorithms
- Static data to cross correlate with sensors



# Cartography

# Data



Years

Data Currency  
Weeks

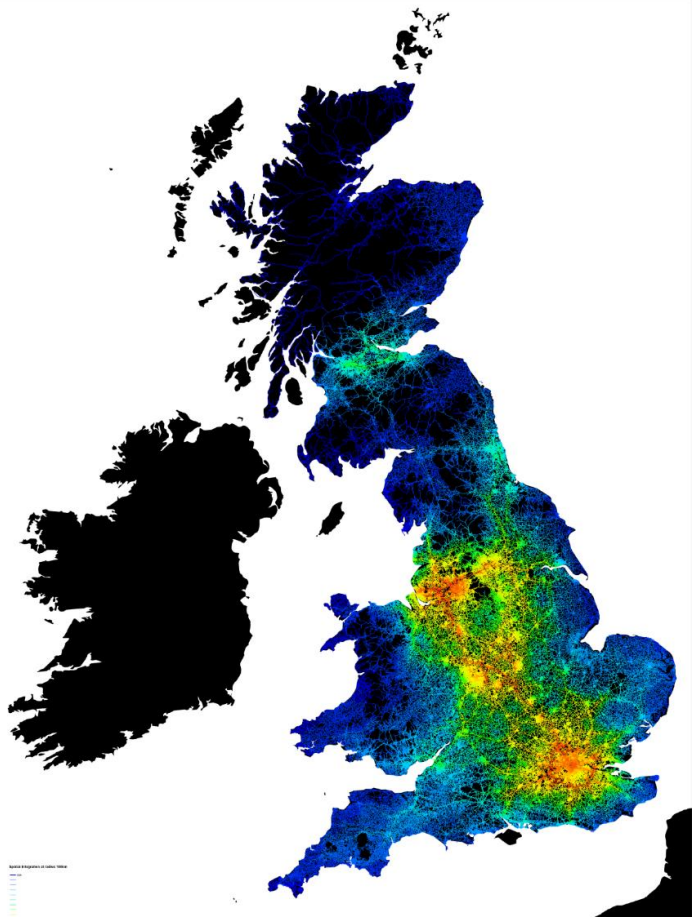
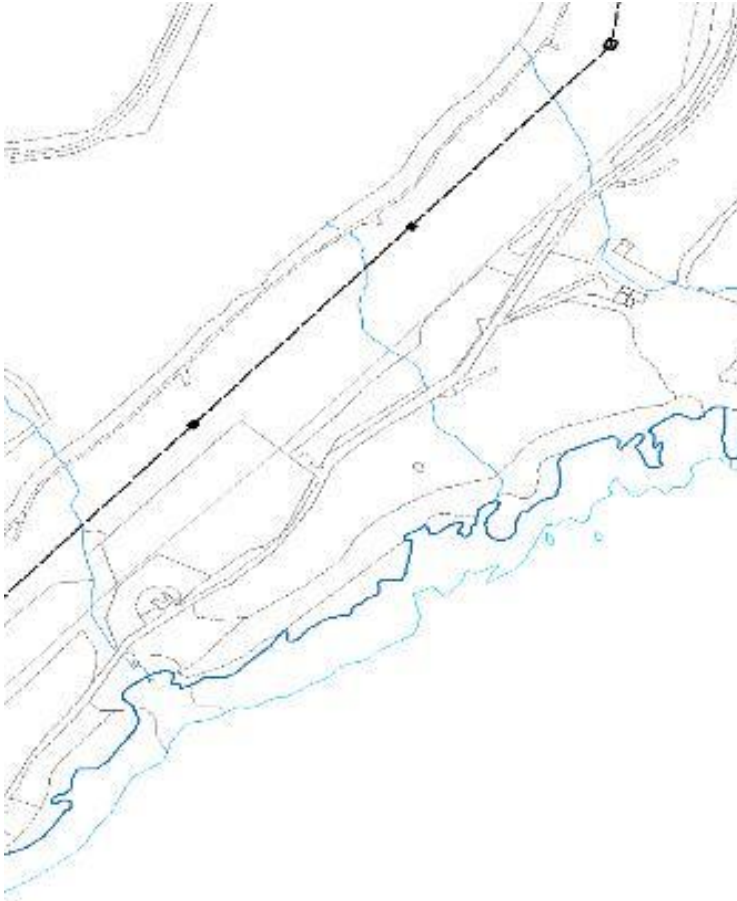
Seconds



# Cartography

# Data

# Connectivity



Years

Data Currency  
Weeks

Seconds



# Astigan – data collection to new heights

Innovation

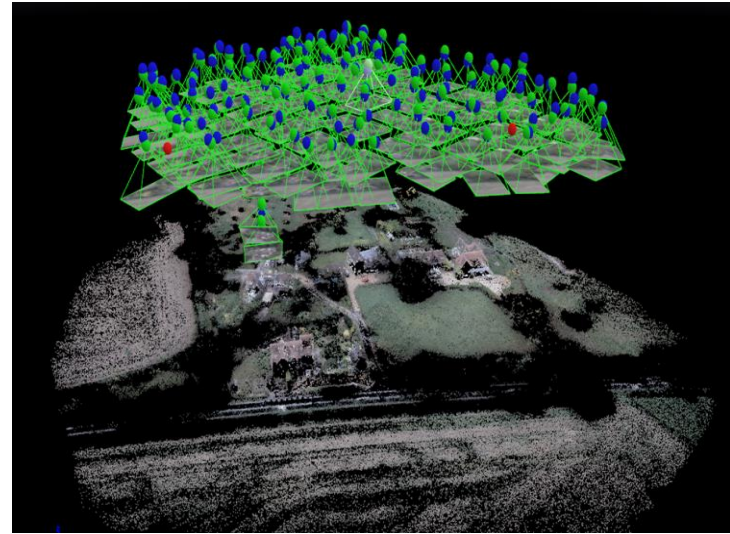
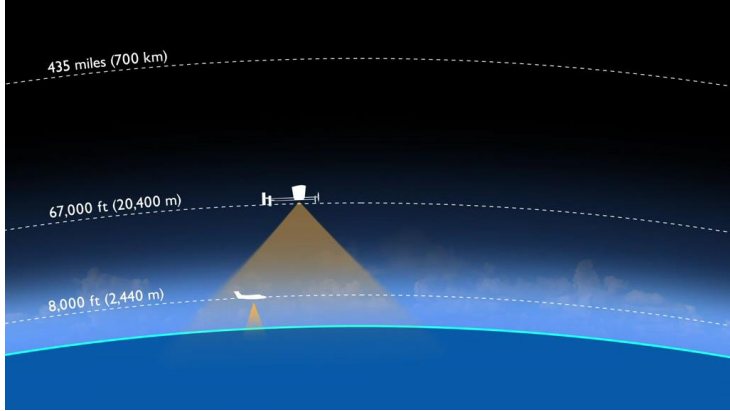


# PLAN

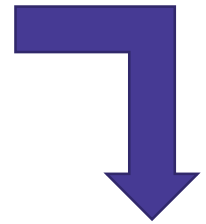


# INTO DATABASE

# FLY



# AUTO EXTRACT



COLLECT



<https://www.youtube.com/watch?v=z7ij4QBfPG4>



# Using other's sensors



Utility vehicles with sensors routinely collecting features into Ordnance Survey Mastermap database. A partnership with Intel



# Cloud Services: Built-in evolution as technology leaps forward



<p><b>3D/4D</b> representation</p>	A 3D architectural rendering of a city street scene, showing buildings, roads, and a central courtyard area.	<p><b>UVS</b></p>	A red and black drone (H520 with E90) flying against a white background.
An aerial view of a city street with green overlays indicating change detection.	<p><b>Automated change detection</b></p>	A blockchain icon showing a chain of three blocks, each labeled with the letter 'B'.	<p><b>Blockchain</b></p>
<p><b>Automated feature extraction</b></p>	A street scene at night with a red dashed box highlighting a building.	<p><b>Big Data</b></p>	A cityscape at night with a network of glowing nodes and lines.
A hand holding a tablet displaying a map with a red dashed box highlighting a building.	<p><b>AI/AR</b></p>	Two icons representing automated generalization: one showing a map with a red dashed box highlighting a building, and another showing a map with a red dashed box highlighting a building.	<p><b>Automated generalization</b></p>

# Integration of third party data for city and region planning and development

Secure | <https://labs.os.uk/prototyping/osel-framework-ite/nwg-innovation-festival/>



Search location

NWG Innovation Festival 2018



## Data catalogue

Clear all layers

- Durham County Council
- Newcastle City Council
- Sunderland City Council
- Northumbrian Water Group
- Northern Powergrid
- Northern Gas Networks



## Properties

OBJECTID  
2049

GISURN  
s167100007745

CONTAM\_N  
6

DATE\_  
1990

DESCRIPT  
Factory or works - use not specified

UNIQUE\_ID  
2049

SHAPE\_AREA  
189090.535617

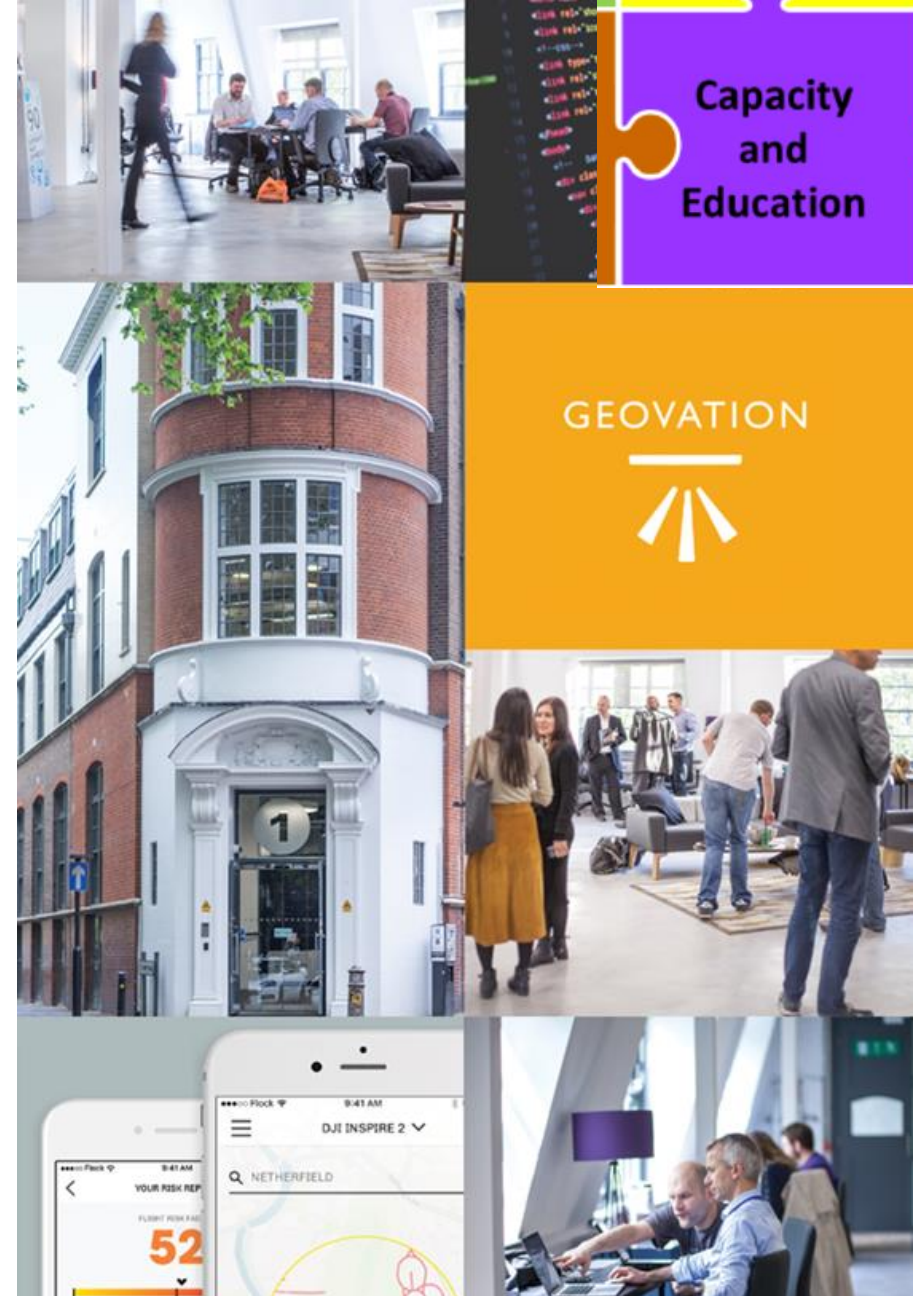
SHAPE\_LEN  
2894.22106463



# Enabling new business

Geovation helps Britain's location and property startups address social, economic and environmental challenges using open innovation methodologies

- >1050 Hub community members
- > £23 Million raised in seed funding
- >200 new jobs created





**Sixth High Level Forum on  
UN Global Geospatial Information Management  
Changing the World - Geospatially**

**20-22 April 2020**

**Royal Holloway College, University of London, Windsor, United Kingdom**



ORDNANCE SURVEY

# Thank you

Everything happens somewhere

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