Changing relationships: Accessing Subsurface Knowledge (ASK)

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Increasingly urbanised world – places of opportunities and challenges

Cities cover

2% Earth's surface
54% population

Places of opportunities & challenges
New spatial planning approaches required - integrating above and below ground

Subsurface data (geological, gw) a key part

There needs to be greater front loading of appropriate data to Development Planning

*geoagnetic & gw data being used earlier > more sustainable development and management of resources*

Present large uncertainty in ground conditions and resources:
- At a project-scale: largest single cause of construction overspends
- At a city & project scale:
  - Lack of use of subsurface opportunities
  - key blockage to city authorities & regulators to unlock brownfield development and use subsurface resources effectively
A greater city knowledge base – need to make better use of the total sum of data which exists and is generated across sectors

Greater integration of subsurface data and resources into planning and policy – front-loaded to Development Planning
Yet there are fundamental knowledge and communication gaps between specialists

NERC & Univ - Limited awareness of what are relevant formats of research outputs; key data & knowledge gaps

Only few cities worldwide have any substantial subsurface planning

> Need to make better use of the data exists, & cross-sector awareness

Cities of tomorrow
Challenges, visions, ways forward

City planners unaware of subsurface opportunities or available NERC research, or its appropriate use
Wealth of data is unaccessed

Only 18% of data from recent major infrastructure projects can be used with high degree of confidence.

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<th></th>
<th>% BH reported for</th>
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Data still in multiple formats

Newly acquired data difficult to add to existing data

Limited revision of BGS 3D models and products

Engineering, and planning decisions based on local self-contained dataset
BIM, 3D geological & groundwater modelling – only part of the solution

Key disconnects –
between private sector, city planning, & geological survey models-datasets

Crucially – appropriate use of existing models/data is not mapped through decision making processes – CUSP
Changing relationships UK

Accessing Subsurface Knowledge

..a knowledge exchange network
between data generators and end users

1) Data -- Develop and exchange high quality, accessible, systematic subsurface datasets and models -- relating to geology, groundwater

2) Awareness of data available and mutual benefit across sectors

3) Co-producing appropriate use of relevant data at different scales in urban development
Glasgow trial: centralised, standardised & validated subsurface data

- utilised existing industry AGS digital standard
- Validated data to the standard
- Contractual enforcement
- Data easily re-useable
- Data efficiently transferred between consultants, contractors, local authorities and BGS
- Better data sharing – better understanding – efficiency savings
- Knowledge exchange network

Single data format – easy to use and add to existing data
Central NGDC/BGS data repository
Delivery of more user relevant data products
Engineering, and planning decisions based on wider datasets & understanding
Impacts of Glasgow trial

Strong engagement at local and national level from Glasgow trial

Deposition of validated AGS data to BGS contractual requirement of framework contractors

New city-wide monitoring points being identified and planned by private sector – adopted by city authority and regulators
Impacts of Glasgow trial

Increased data re-use, increased access to BGS datasets and models under Innovation agreement

Wide recognition that improved understanding of subsurface, lower project risks and costs & better integrated use of resources

Reported benefits from public and private sector

“Using the ASK Network 3D models from BGS has increased certainty at an earlier stage in project planning and improved financial forecasting… for infrastructure upgrades in Glasgow”

“For modest initial investment in training and communication with contractors…. [it] has led to significant benefits: improved ability to handle large data sets & 3D visualisation of data, improved confidence of ground conditions and enabled closer attainment of optimum design [gw remediation & construction]."

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Upscaling from Glasgow to UK

Building and adapting foundations from Glasgow

Pioneers – key stakeholders and pilot cities

Establishing exemplars, and identifying key KE pathways for followers to emulate
Upscaling from Glasgow to UK

New UK digital data portal

AGS
NERC
SCIENCE OF THE ENVIRONMENT

ePlanning.scot

Contractual requirement of National Stakeholders

Scottish Water
Always serving Scotland

TRANSPORT SCOTLAND
CÔMHDHAIL ALBA

Grontmij
Part of Sweco
Planning & procurement processes have a key role to play
> Same standardised data ingestion by all
> Other national data portals (eg building warrant, SEPA) - Link to national geoscience data repository

Need to engage with several levels of planning and procurement processes

National procurement and planning policy
City authorities
Consultancies (contracted by city authority)
Contractors (contracted by consultancies on behalf of city)
Generating a shared data and knowledge resource is one part, also need...

Mapping appropriate data through decision making processes
Requires mutual understanding of specialists

For 1) front loading appropriate knowledge to regulators and city authorities

> can enable integrated above and below ground spatial planning

> will assist sustainable use of subsurface resources
2) Mapping data use at project or site-scale

Data now procured in standardised accessible format.... But also needs to be used by all sectors in the project for resource management, & integrated spatial urban development.
Mutual understanding of what data, at what time, in what format

Developing new Subsurface Supplementary Planning Guidance

Development of Subsurface Supplementary planning guidance 2015-18

- UK first supplementary planning guidance
- planning, building control, SEPA authorities
- Scoping national policy opportunities –challenges with Welsh and Scottish Governments

Above and below ground City Information Tool: for 3D Development Planning

- integrating above and below ground Development Plan Data

Shared cross-sectoral data platforms: Individual Development Projects

- Research, Public, Private, City
- Removing the disconnects between available data, and individual sector BIMs
The proposed City Development Plan or Glasgow recognises the importance of the subsurface environment in the development of spatial strategy, policies and proposals for the future use of land and infrastructure in Glasgow, reflecting the growing awareness of the importance of subsurface knowledge for the City.

www.glasgow.gov.uk/developmentplan
Sharing best practice in Europe – EU COST Action

Collaboration between cities & geological surveys

Developing subsurface planning

- relating sub-surface infrastructure such as utility services, district heating, energy and broadband infrastructure and transport, SUDS and water management infrastructure
How would you like to use and develop subsurface data & knowledge in the future? #changing relationships