

Transforming the exchange of subsurface data and knowledge between the public and private sectors: a pilot in Glasgow, UK

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Incomplete understanding of ground conditions is, at present, a major limiting factor to effective and sustainable management in urban areas and a key factor in overspend and delay in the construction industry across Europe. Recent collaboration between the British Geological Survey (BGS), Glasgow City Council (GCC) and the private sector, including Grontmij, has demonstrated the potential for creating a major beneficial change in how subsurface data in urban areas are reported and exchanged, especially within attributed 3D models. In tandem with INSPIRE, the data can therefore be stored and re-used far more effectively.



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL



The need for better data and knowledge exchange

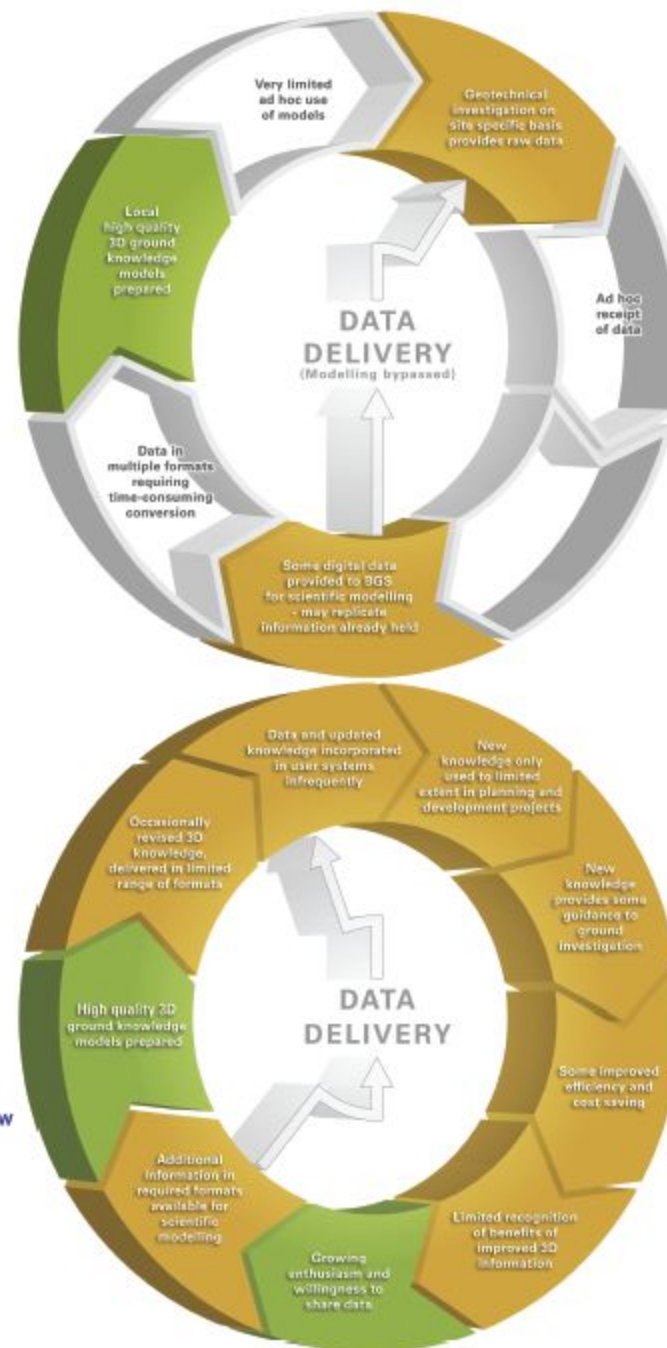
There is extensive evidence in the UK of incomplete access to the subsurface data that exists in urban areas. As a result, unforeseen ground conditions are more likely to be encountered than should be the case.

Rather than reflecting a lack of investment, more often than not, unforeseen ground conditions reflect the poor reporting and exchange of subsurface data between different organisations in urban areas, and the difficulty in accessing and re-using data.

In any one construction or urban regeneration project, the same subsurface data is held, and reported, by multiple users, in different formats. Poor exchange and reporting of the data between users means key information, such as borehole details, often become disconnected from the associated geo-technical data (e.g. groundwater, engineering data), and multiple versions of the same data exist in different formats.

As a result, typically 50% of subsurface data become unusable due to fragmentation and loss of key reference data, and difficulty in accessing the data in the absence of an accessible centralised depository.

Fig. 1 - (Top) Current status of national subsurface data and knowledge exchange in the UK, where data are fragmented and become 'lost'; and (bottom), the Glasgow status of data and knowledge exchange, which is rather better than the national average, with users more aware of the data available, and better digital data exchange, but the value of data is still often diminished by a lack of standardised reporting or revision and updating of datasets.



3D urban subsurface models

Geological surveys in Europe are at the forefront of developing 3D urban subsurface models to improve understanding of subsurface conditions and make much more effective use of ground investigation data (Fig. 2).

However, poor connections, for example in the flow of groundwater investigation data between public, private and research organisations, has meant the models, and the decisions which they influence, are based on a fraction of the data and knowledge that is actually available.

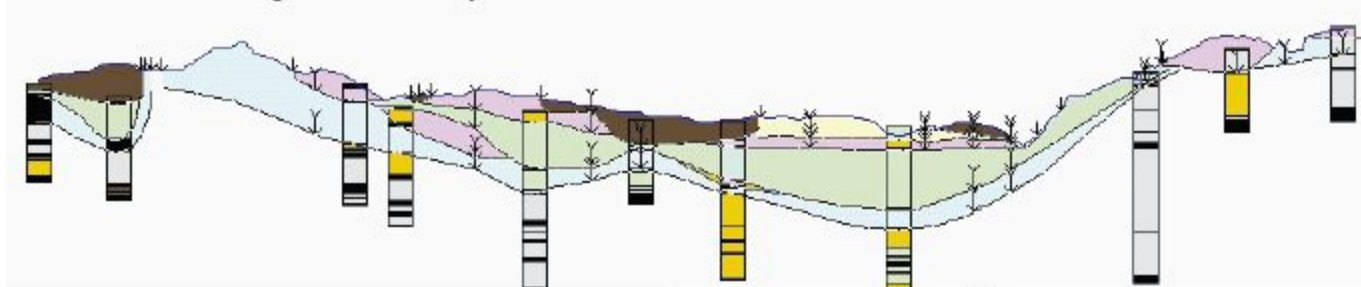
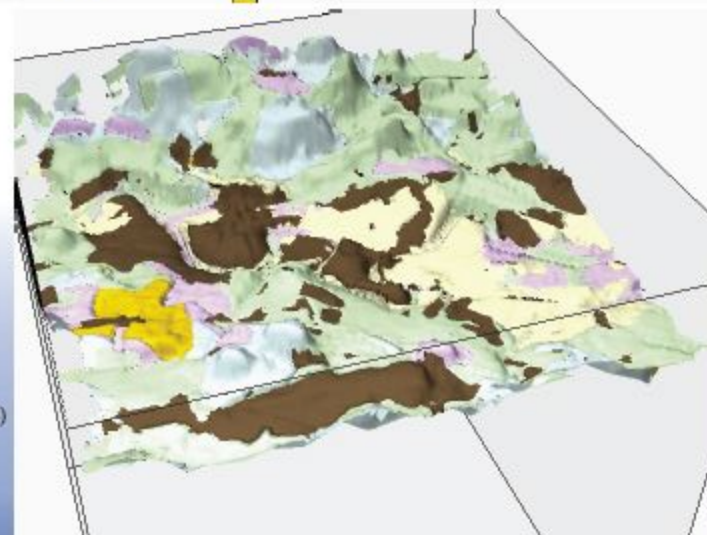


Fig. 2 - The 3D geological model of Glasgow developed by BGS in partnership with Glasgow City Council (GCC) is based on over 50,000 borehole records, and is the most comprehensive conurbation-scale model yet developed in the UK - but thousands more borehole records had to be excluded from the model, as a result of the data being incomplete or inaccessible.



* Partners in ASK

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Developing a major change in urban knowledge exchange

Recent collaboration between BGS and GCC has demonstrated the potential benefits of, and the conditions required for, a major transformation in knowledge exchange between the private, public and research sectors*, and how data can be exchanged, stored, and re-used far more effectively.

Accessing Subsurface Knowledge (ASK)

ASK - a pilot data and knowledge exchange network between public and private sectors in urban Glasgow, developed by BGS, GCC and other partners*.

ASK aims to:

- (i) develop and exchange high quality systematic subsurface datasets.
- (ii) facilitate effective re-use of subsurface data to support decision making and management of urban resources (Fig 3).
- (iii) establish a data transfer mechanism to a centralised depository for raw subsurface data in a standardised format, to increase the accessibility and re-use of data in urban areas.
- (iv) assess how ASK could be more generally.

Key components:

- (i) An improved data transfer mechanism between the public and private sectors in Glasgow; data reported to GCC must be to a standard specification (GSPEC), compliant with existing industry standards for data reporting, as developed by the Association of Geotechnical and Geoenvironmental Specialists (AGS).
- (ii) A web portal to check data for compliance before data can be accepted by GCC.
- (iii) Data deposited to GCC, will be transferred to BGS, to facilitate regular revision and updates of 3D subsurface models and datasets, which will be of more relevance and use to the wider community.
- (iv) A network of public and private sectors partners*, for effective data exchange (Fig 3).



Fig. 3 - (Top) the Glasgow ASK aspiration of more standardised reporting of raw geoscience data, better availability and re-use of the data, following the EU INSPIRE principles; and (bottom) the proposed ASK network and its interactions.

A standard for change

ASK is intended to set a standard for developing effective data transfer, both nationally - e.g. by adoption by national organisations such as the Highways Agency - and more widely across Europe in tandem with INSPIRE.

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