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How do geological surveys respond to evolving uses and interaction in the urban subsurface?

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The UK Government Office for Science has recently commissioned a Foresight Project on the 'Future of the Subsurface'. The project draws on experts across different government departments and industry - including representative from the geological and environmental community, planning specialists, infrastructure and service providers, city authorities and energy specialists - to understand the future demands that will be placed on the subsurface to deliver our sustainable development goals; What are the high-value future societal subsurface uses? What climatic and environmental pressures are expected? What policy interventions will be required to protect and enhance the value of the subsurface in the longer-term? We present outcomes from the Foresight project's subsurface issues paper, alongside recommendations from the National and Regional level expert elicitation. Drawing on our research in urban geosciences and subsurface assessment we highlight how geological surveys can, and are, responding to the issues and recommendations highlighted by the Foresight project. Some common themes emerge for which the geological survey has a role, for example, ensuring coordinated and interdisciplinary approaches to planning; Assessing opportunities to update or streamline subsurface governance and regulation; Improving the coverage, quality, availability and interoperability of data.

In addition to these overarching principles, the variability of regional geology in the UK and its impact on subsurface issues is a prominent outcome of the Foresight project and necessitates place-based approaches, tailored to distinct geologies and geographies, to define a hierarchy of subsurface need. The UK has a particularly varied geology spanning the whole Phanerozoic this means that there are very different geological problems in different cities. Taking this placed-based approach we show how the evolution of 3D geology mapping and geospatial tools at the British Geological Survey (BGS), has shifted towards multi-assessment to appraise the diverse integrated and competing subsurface uses. We highlight the practical applications of 3D models in improving data availability and accessibility e.g. by updating geological maps, enhancing data products, and facilitating user accessibility through tools like model viewers. The paper concludes by emphasizing the importance of geological information to help facilitate dialogue and stakeholder consultation, and support evidence-based policymaking.