

BGS Response to **Call for evidence: Geospatial opportunities across the economy**

1. Which changes or trends over the last five years do you think have had the biggest impact on the use of location data (e.g. market conditions, consumer behaviour, technological advancements)?
 - Growing need for more precise and accurate information from regulators, infrastructure managers and developers; as for example shown through the Covid crisis which demonstrated a heightened need for geospatial data in terms of how UK society and UK plc respond and adapt (resource allocation, planning services, etc) both immediately and longer term
 - General move towards more 'open' data, with acknowledgement that the value/impact of the data is in how it's applied, and the insight derived from that open geospatial data
 - Global community and increased virtual connectivity – an expectation from consumers and citizens of how geospatial data could and should be used to enhance their lives, and deliver better and more personalised services
 - This is balanced against growing awareness and concerns around data privacy, geospatial used properly can provide more accurate and personalised service/content, but without imposing upon individual's sense of privacy and control
 - The rapidly changing and growing use of technology, for example remote sensing and artificial intelligence to capture and interpret more and new/different geospatial data
2. Which changes or trends do you anticipate having the biggest impact on the use of location data in the next five years?
 - Global recession: people having less disposable income and squeeze on both public and private sector finances will mean a heightened requirement for geospatial data to drive change, alongside possible increase in nefarious criminal activity relating to the use of personal and geospatial data
 - Changes in government investment and focus in National energy and infrastructure programmes – for example climate change (the imperative for geospatial data to inform and build adaptation and resilience responses to climate change, for example around carbon storage, geohazards risk, green energy transition and water security) and critical minerals (including, for example, locating, accessing, clean extraction and usage of critical minerals to support for example the technology consumables sector)
 - The recognition for the need for more cross-governmental and associated agencies joined-up thinking and collaboration to unpick the power of geospatial data and encourage innovation and insight
 - FAIR standardisation and evolution, dominating government and scientific data provision and growing understanding and awareness
 - Easier access to high-powered computing through growing readily availability of processing and accessing capabilities, both software and via cloud-based solutions – for example, easier availability to machine/deep-learning data analysis tools, web-served apps and geospatial opensource package codes
3. Do you have any comment on this characterisation of the ecosystem (below), and is there anything you would add, remove or change?
 - Data 'storage' cannot be underestimated and is standalone pillar in its own right, its definition/use-case/purpose is different to that of 'hosting' – as such, less emphasis

on owning infrastructure to deliver capabilities (data storage / data processing power) and more on accessing externally hosted services

- The ecosystem should more strongly reference the linking-in to other datasets sitting elsewhere (inside or outside of that organisation)
- A fifth column could be added, about monitoring the usage of data and assessing, quantifying and sharing the 'impact' of the utilisation of that geospatial data
- Data ingestion from 3rd parties will inform the creation and transformation stages (i.e. not all organisations capture and create their own data)
- Definitions of 'Visualisation' often confuses understanding the performance of the system (i.e. management information) with understanding the actual distribution and impact of the outputted geospatial data

4. How integral is location data to your or your organisation's activities? "Core, partly, n/a"
Core

5. Which section(s) of the data value chain does your organisation operate in? Organisational importance - for each section of the value chain select "Core, partly, n/a"

- Data capture and creation Core
- Data transformation, processing and systems Core
- Data analysis and visualisation Core
- Application of data Core

6. What are the main blockers for you or your organisation in using location data to achieve your objectives? (High, Med, Low, n/a)

- Findability of data Low
- Accessibility of data High
- Interoperability of data Med
- Reusability of data Low
- Lack of awareness and/or difficulty communicating about location data Med
- Privacy laws and/or ethical considerations for the use of location data Low
- Geospatial skills (e.g. surveying, GIS) Low
- Wider data skills (e.g. data science) Med
- Funding Low
- Other (please specify) n/a Legacy datasets - for which data access conditions are not properly attributed or understood, meaning these valuable data sources have to be excluded from geospatial modelling

7. N/A – repeats Qn6

8. Which technologies are likely to be the most important for you or your organisation when using or innovating with location data over the next five years? (H/M/L)

- Artificial intelligence/Machine learning High
- Automation and robotics Low
- Geo-Building Information Modelling (BIM) Med
- Digital twins Med
- Visualisation and immersive tech (AR/VR/MR) High
- Internet of Things Low
- Satellite and airborne remote sensing (including earth observation) High

- Cloud computing High
- Crowd-sourced data Low
- Miniaturisation of new sensors: Med
- Quantum computing Low
- Edge computing Med
- Other (please specify) n/a

9. Which technologies should the UK prioritise development for to provide new opportunities to process and exploit location data for economic growth over the next five years? (H/M/L)

- Artificial intelligence/Machine learning High
- Automation and robotics Low
- Geo-Building Information Modelling (BIM) Low
- Digital twins High
- Visualisation and immersive tech (AR/VR/MR) High
- Internet of Things Med
- Satellite and airborne remote sensing (including earth observation) High
- Cloud computing High
- Crowd-sourced data Med
- Miniaturisation of new sensors Med
- Quantum computing Med
- Edge computing Med
- Other (please specify) n/a

10. Please give specific examples of how the UK public sector / the Geospatial Commission can support innovative applications of location data with these technologies?

- The GC is the 'voice' for geospatial data within and across UK Government – as such, the GC has an important role in extolling the virtues and ensuring all government departments (national, regional and local) and arms-length agencies are being made aware of the importance of geospatial data
- The Geospatial Commission should be leading the debate regarding the standards/protocol on how geospatial data should be managed, used and shared – albeit the public sector should not step-in or 'compete' where UK plc is, or could, provide that geospatial data service
- Creating the environment (and where appropriate the financial support) to encourage and enable data sharing and the sharing of ideas around geospatial data; for example, identifying and unblocking barriers around data accessibility and usability across multi-agencies and between the public and private sector
- Helping public sector organisations reveal and articulate the 'impact' of geospatial data (either financially or softer, non-financially defined, benefits)

11. Please give specific examples of where location data and technology could be transformational in sectors across the economy. What scale of economic, social and/or environmental impact do you anticipate as a result?

- Remote earth observation and monitoring services, e.g. Earthquakes, flooding – early warning systems, building-up database of incidences to help predict and mitigate future events

- Using crowd-sourcing techniques, but with robust QA and capture technology, as a means of building-up geospatial databases through citizen science
- Surveying technology for hard-to-reach geographic places and use-cases, such as critical minerals, deep-sea carbon storage
- Digital twins, developing what-if scenarios for major infrastructure developments through integrating static baseline and real-time dynamic geospatial data into environmental modelling processes
- National scale data acquisition, such as airborne geophysical survey
- Coordination/access of marine and seabed data across sectors to support the energy transition, as well as ecosystem response

12. How could you or your organisation contribute to driving better awareness of the value of geospatial?

- Outbound communications material, demonstrating the value/impact through case-studies and providing examples where geospatial information (data and insight) has influenced policy decisions and infrastructure development
- Working closer with academia research and early careerists to help them realise the importance and usefulness of geospatial data
- Encouraging geospatial within school curriculum to raise awareness

13. Please give specific examples of effective collaboration to deliver geospatial applications, and the type of people or organisations that do, or could, collaborate. (Please include international collaboration if appropriate) *

- Using third party distribution channels to extend awareness and the reach/utilisation of data, alongside presenting opportunities for innovation with data sharing
- Cross-agency collaboration in the the development and delivery of interoperable digital twins
- The new UK Centre for Seabed Mapping coordinates acquisition of bathymetry data across the public sector, as well as serving as hub for seabed mapping applications.

14. Would you like your response to be confidential? YES/NO

15. Who are you responding on behalf of? *

- A public body

16. Where are you / your organisation based? (if you are based outside of the UK, please specify the country): *

- East Midlands

16. What is the name of your organisation?

British Geological Survey

17. What is your role within the organisation?

Head, digital data products – within the BGS Informatics directorate

18. How many people work for your organisation? *

- 250+

19. What best describes the industry that you or your organisation is involved in (you may select more than one): *

- Professional, scientific and technical activities