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Maximising the benefit of past investment: the subsurface agenda – a case study from Glasgow

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Which INSPIRE theme?

Annex I	Annex II	Annex III
 Coordinate reference systems Geographical grid systems Geographical names Administrative units Addresses Cadastral parcels Transport networks Hydrography Protected sites 	 Elevation Land cover Orthoimagery Geology 	 Statistical units Buildings Soil Land use Human health and safety Utility and Government services Environmental monitoring facilities Production and industrial facilities Agricultural and aquaculture facilities Agricultural and aquaculture facilities Population distribution – demography Area management / restriction / regulation zones & reporting units Natural risk zones Atmospheric conditions Meteorological geographical features Soceanographic geographical features Sea regions Bio-geographical regions Habitats and biotopes Species distribution Energy resources Mineral resources

Which INSPIRE theme?

1. Coordinate reference systems1.2.	. Elevation	1 Statistical units
 2. Geographical grid systems 3. Geographical names 4. Administrative units 5. Addresses 6. Cadastral parcels 7. Transport networks 8. Hydrography 9. Protected sites 	. Land cover . Orthoimagery . Geology	 2. Buildings 3. Soil 4. Land use 5. Human health and safety 6. Utility and Government services 7. Environmental monitoring facilities 8. Production and industrial facilities 9. Agricultural and aquaculture facilities 10. Population distribution – demography
9. Protected sites		 Population distribution – demography Area management / restriction / regulation zones & reporting units Natural risk zones Atmospheric conditions Meteorological geographical features Oceanographic geographical features Sea regions Sea regions Habitats and biotopes Species distribution Energy resources

BGS: TWG Editor Geology, Mineral Resources & Coord for Natural Risk Zones

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Geology – the 3rd dimension



Zone of Human Interaction

the subsurface – unseen side of construction

Brownfield sites





Urban regeneration

You must know what you are building on



you need subsurface information..

Much of it is already available -- the past investment





But more is required





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Slide 7 of 17

Ground Investigation

Ground Investigation costs*:

c. 2% of substructure costsc. 0.1% overall building costs



BUT industry reports ground problems cause:

- 30 50 % of delays to projects
- 50% over-run > 1 month
- Most common source of project risk & overspend
- Costly resolution, claims and litigation
- Focus on unforeseen ground conditions

" unforeseen ground conditions"



"DEFRA estimate that £210m per year is spent unnecessarily on remediation due to poor site investigation"

Brownfield Briefing: Cost-Effective Site Investigation, London 15-16 June 2011

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Addressing the problem - INSPIRE approach

Could increase spend on more boreholes etc.

But, much better to maximise use of existing, and future, data & knowledge, e.g. In 3D models

BUT problems in accessing all publicly-held data:

- numerous forms/standards
- very variable quality
- re-use prevented by conflicting acts/regulations/IPR
- confidentiality issues
- Poor accessibility (analogue v digital, multiple locations)







following some INSPIRE principles..

- Data should be collected only once and kept where it can be maintained most effectively
- Easy to find what geographic information is available, how it can be used to meet a particular need, and under which conditions it can be acquired and used

For Glasgow 3D models:

- Over 35,000 boreholes in BGS archive
- But many more held by GCC
- Access and constraints impede their reuse (by BGS)
- So improved data flow & partnership key to efficiency gains

The Glasgow partnership solution....

GCCs consultants and contractors (e.g. Grontmij)

- use simple data acquisition templates (INSPIREcompliant) for ground investigation data
- provide georeferenced site plans

Glasgow City Council (Client):

- Receive and use data
- Transfer key data to BGS

BGS (National Custodian):

- Archive & reinterpret data to update 3D models/GIS
- GCC upload BGS updates to support decision making

All using web services to reduce costs for all parties

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The wider perspective

Partnership approach towards culture of improved data accessibility and exchange:

- between LAs & BGS
- and between public & private sectors



Hence

- national subsurface 3D models for decision makers
- reduction in costly unforeseen ground conditions
- improved/ timely delivery of public construction
- potential culture change in private sector
- direct savings to government and Industry

And the scale of the impact?

the construction industry....



10% of GDP 26 million jobs





10% of GDP €10.8 bn (2009)



Any questions?

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