COST Action Sub-Urban 2013-2017

Opening up the subsurface for the cities of tomorrow

The GeoCIM Concept

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The ground beneath our cities

The need to include the subsurface in urban planning is no longer questioned.

- maximise benefits of subsurface resources
- recognise and manage conflicting demands on the subsurface
- safeguard subsurface ecosystem services
- address geoscience-related hazards
Who are we?

Sub-Urban is a European network of Geological Survey Organisations, Cities and Research Partners working together to improve how we manage the ground beneath our cities.
Main objectives

1. **Co-ordinate** world leading cross-disciplinary research on the subsurface

2. **Share** techniques, methodologies and subsurface knowledge

3. **Inform and empower** policy and decision makers and provide them with tools they need to make informed decisions

4. **Broaden relevance and impact** by making subsurface knowledge complementary to, and interoperable with, above ground 3D city modelling
Key assets

A collection of 19 City Reports

City setting, subsurface planning, economic issues, quality of life, governance, infrastructure, urban planning, legal framework
Key assets

A collection of 7 thematic reports

- subsurface planning
- geotechnology
- geothermal energy
- data management
- groundwater
- 3D modelling
- cultural heritage

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Considering access to subsurface knowledge – Evaluation of practices and techniques

TU1206 COST Sub-Urban WG2 Report

Susie Mielby, Ingelou Eriksson, Diarmad Campbell, Johannes de Beer, Helen Bonsor, Cécile Le Guern, Rob van der Krogt, David Lawrence, Grzegorz Rysyński, Jeroen Schokker, Carl Watson
Key assets

15 Short Time Scientific Missions

Reports on short term visits between sub-urban partners for exchange of skills and methodologies on a range of topics
**Key assets**

**Online Toolbox**

A fit-for-purpose suite of recommended methodologies, good practice, guidance and case studies to enable the free flow of key subsurface data and knowledge.

Web-based and user-friendly for:
- Subsurface specialists
- Urban planners
- Decision makers
Transforming relationships

Strengthen collaboration between those who deliver urban subsurface knowledge; subsurface specialists, and those who can most benefit from it; urban planners and decision-makers.

Audience tailored views, increasingly powered by public APIs
Creating virtuous circles

- New subsurface data is created (better 3D models)
- Subsurface knowledge is used in planning and R&D
- More (free) data becomes available
- Ground investigations are more focused
- Benefits of subsurface knowledge are recognised
- Time and money are saved

Embed subsurface knowledge and understanding in the very fabric of urban decision making.
The GeoCIM definition

Geo City Information Modelling (GeoCIM) is a process involving the generation, sharing, integration and management of digital representations of physical and functional characteristics of at least the following urban environmental layers:

1. Surface
   Natural and man-made above surface features

2. Anthropogenic subsurface
   Man-made ground, buried infrastructure, foundations

3. Natural subsurface
   Geological units, hazards and processes

Integrated Modelling (or CIM) at city (quarter and above) scales...

.. and urban resources
The GeoCIM concept

Make all spatial data relevant to planning decisions available in common data environment

Source: Jeroen Schokker (TNO) and Carl Watson (BGS), in: Mielby et al, 2016.
Conclusion

GeoCIM will enable the latest developments in subsurface models and mapping to be put to good use in urban-planning departments and by private urban-development actors.

The combination of buildings, piles, traffic lanes, boreholes and modelled bedrock surface. Example from Tampere, Finland (Schokker et al., 2016)
To open up the subsurface for the cities of tomorrow, it is crucial to:

• develop integrated 3D models expanding on BIM-principles, and
• to make surface - and subsurface data an explicit requirement for sustainable planning and development.

Subsurface information need to be:

• of the right type,
• in the right format,
• at the right time, and
• understandable for users to take decisions
In other words: making collaboration work!

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