

2.1 Geoelectrical Imaging for Site Investigation for Urban Underground Infrastructure

Investigations prior to large infrastructure projects are often primarily based on geotechnical sampling and sounding methods. The information about the volume between the boreholes is hence often missing. Modern geophysical methods have the capability of mapping the underground in 2D and 3D in a cost and time efficient manner.

This R&D project focuses on developing and adapting Resistivity and DCIP technique for use in the challenging urban environment.

This is done by development of:

- New data collection methodology
- Prototype equipment
- Inversion technique
- Finding relations between geophysical, geotechnical and environmental parameters

The TRUST 2.1-project is part of the umbrella TRUST- project – Transparent Underground STructures, financed mainly by Formas. Total budget 1.8 M Eur.

Key parts

- Developing technique for handling of urban noise and obstacles
- Develop methodology for 3D surveys in urban area
- Improve knowledge on how to interpret contaminated soils from geoelectrical methods
- Improve detailed interpretation of geological features

Aims

- Adaption of data acquisition strategies, methodology and data processing
- Developing prototype DCIP equipment for description of the subsurface in 3D
- Development of algorithms for 3D inversion of DCIP data
- Investigation of possible correlations between geophysical and engineering/environmental key parameters
- Integration of all the TRUST sub-projects, for building up a holistic survey methodology
- Implementation of gained knowledge in the industry

Time plan

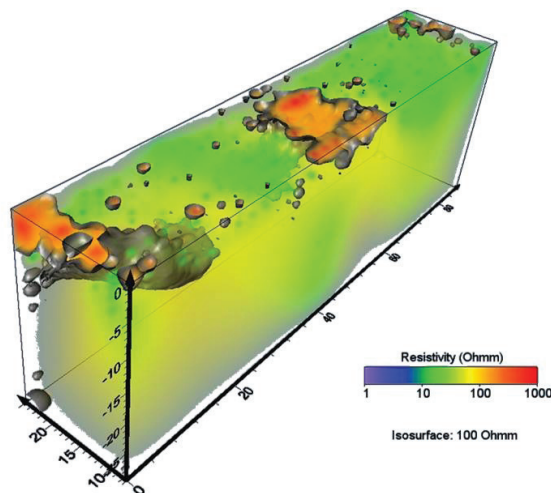
2013 - 2016

Contact

Torleif Dahlin - LU
torleif.dahlin@tg.lth.se
www.trust-geoinfra.se



Fieldwork on contaminated site.



3D-result, PCE-contaminated site.

Vision

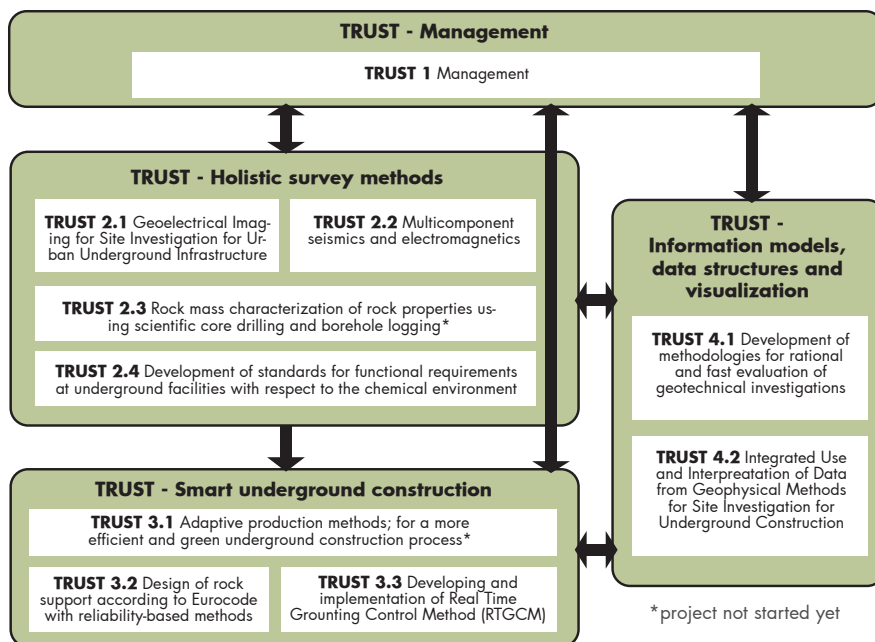
To improve the potential for geophysical methods to interpret ground conditions with respect to geology, groundwater, structures and pollution in urban environment, in order to achieve more cost effective construction of infrastructure.

Financiers

TRUST TRansparent UndergrounD STructure

- Develop methods for more efficient underground infrastructure design in urban environment in a LCC perspective
- The biggest geotechnically related R&D project in Sweden, with a total budget of 75 mill skr
- Cooperation between researchers at six universities and specialists in the building industry
- Engages 10 PhD students

TRUST organization



Background

While the road and railway net is growing it becomes more important to design and build more cost efficient underground structures, which at the same time are sustainable, safe, and easy to maintain. It is therefore crucial to develop, and also implement, methods and technique for planning, design and construction of urban underground structures. This has to be done in a LCC perspective.

Participating organizations

- Chalmers University of Technology
- Royal Institute of Technology, KTH
- Lund University, LU
- Luleå University of Technology, LTU
- NCC
- Geological Survey of Sweden, SGU
- The Swedish Transport Administration
- Tyréns
- Uppsala University
- University of Aarhus

Time plan

2013 - 2016

Vision

- Promote research on development of sustainable urban underground infrastructure design
- Develop improved methods and tools for better planning, design and construction of urban underground structures

Contact

Maria Ask - LTU
 maria.ask@ltu.se
 www.trust-geoinfra.se

Financiers

