

GeoBIM – a tool for optimal use of geotechnical data

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The TRUST logo features the word "TRUST" in large, bold, dark grey letters. Below the letters are stylized, overlapping green hills. A horizontal line runs across the middle of the hills, with the text "Transparent Underground Structure" positioned below it. To the left of the hills, there is a silhouette of a cityscape with a tall skyscraper, a tree, and a person walking a dog. A hot air balloon is also visible in the sky above the hills.

TRUST

Transparent Underground Structure

Who am I?

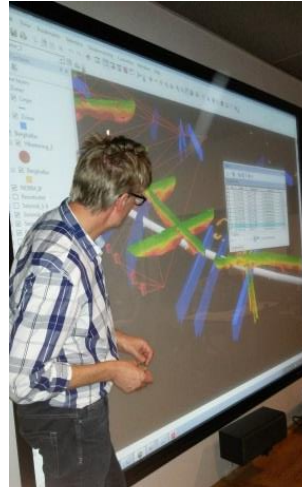
- Civil engineer Lund University, Sweden, 1990
- PhD Geotechnics/Geophysics 2001
- Consultant , Tyréns field geophysics 2002
- Head of Tyréns Geo department 2006

- Enthusiastic about
 - Combining different data for best geo model
 - Geophysics
 - Visualization of geo data
 - Well organized data



Many different actors

- Hydrogeologists
- Geotechnical engineers
- Contaminated soil specialists
- Other engineering disciplines
- Society in general
- Contractors
- Authorities
- Clients
- Politicians
- Media



Samråd

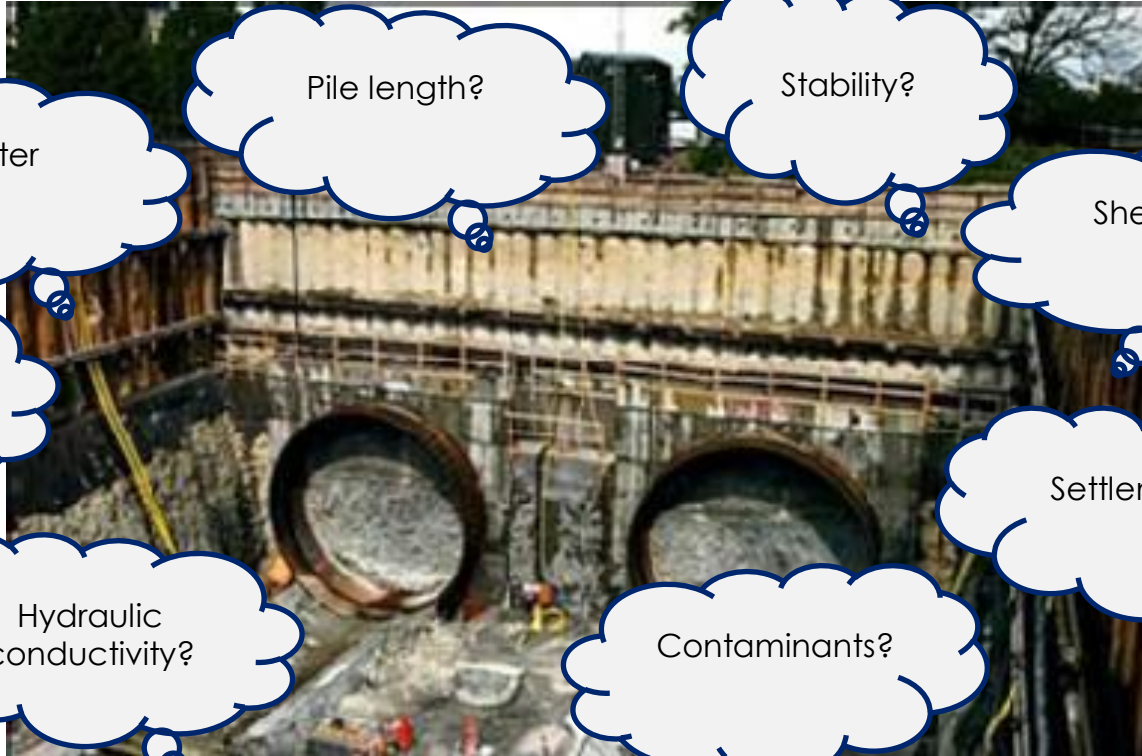
18:00-20:00
Hålanda Bygdegård
2014-02-26

Väg 1978,
delen Verle -
Gräfsnäs



TRAFIKVERKET

Different needs.... Different capacity



Groundwater lowering?

Pile length?

Stability?

Sheet pile anchor levels?

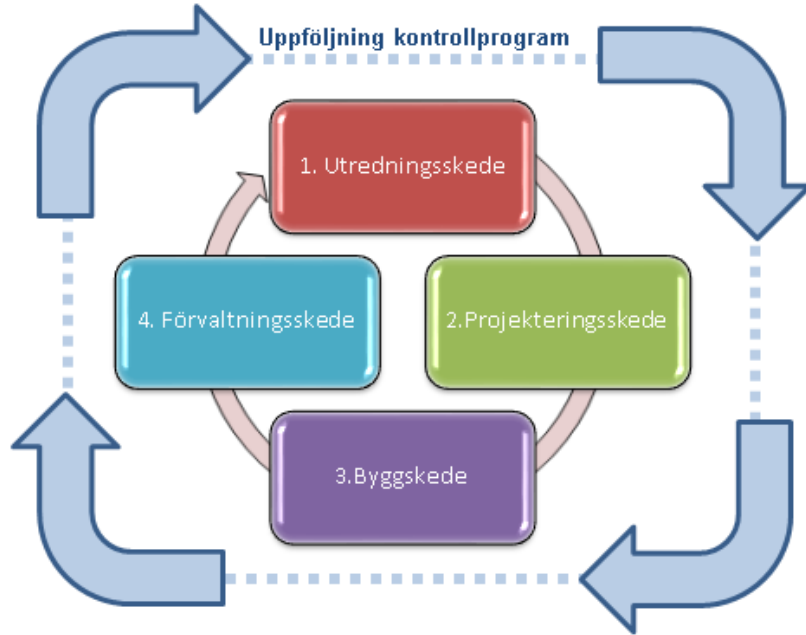
Vibrations?

Settlements?

Hydraulic conductivity?

Contaminants?

From field to long time administration



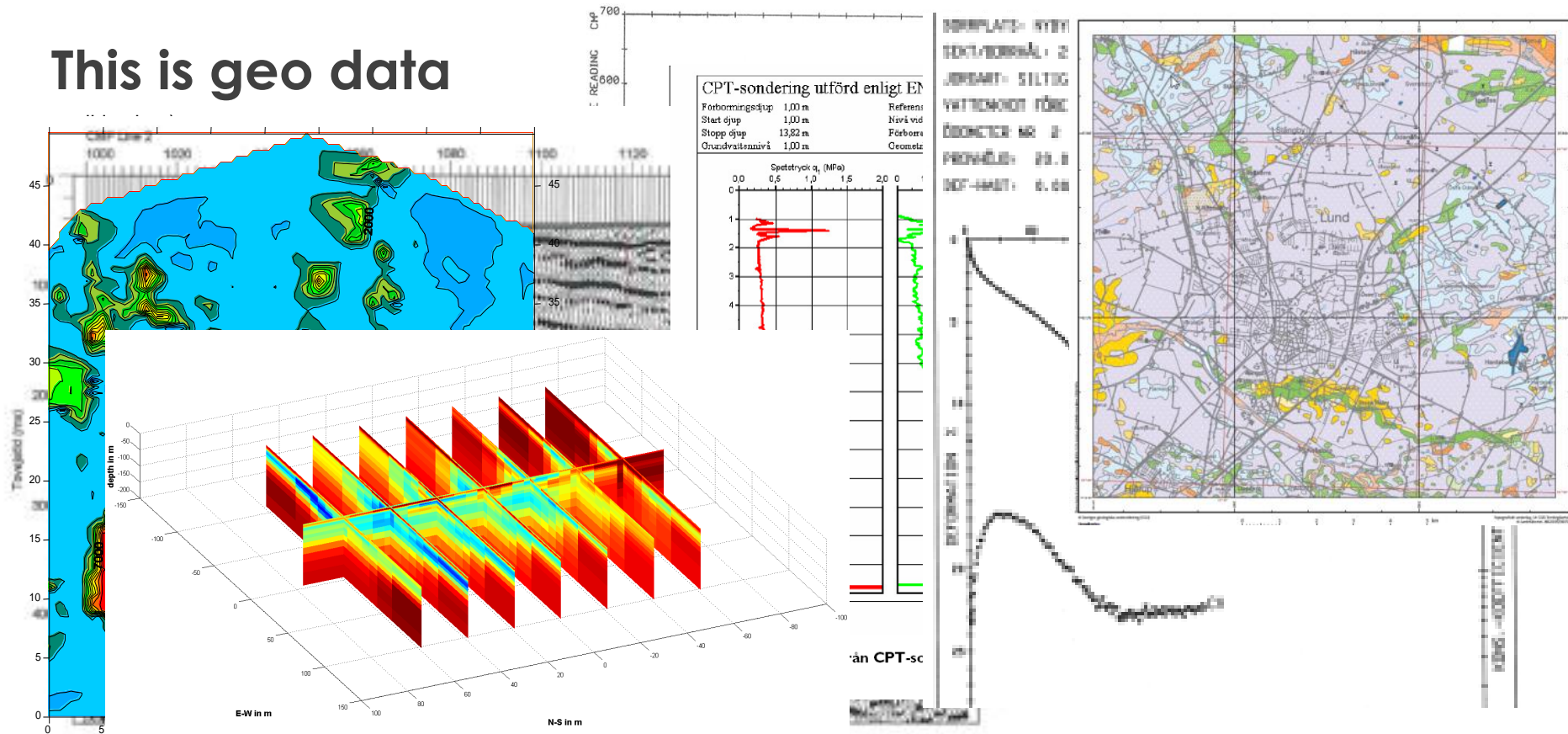
Today authorities lose data:

- Bypass Stockholm city tunnel

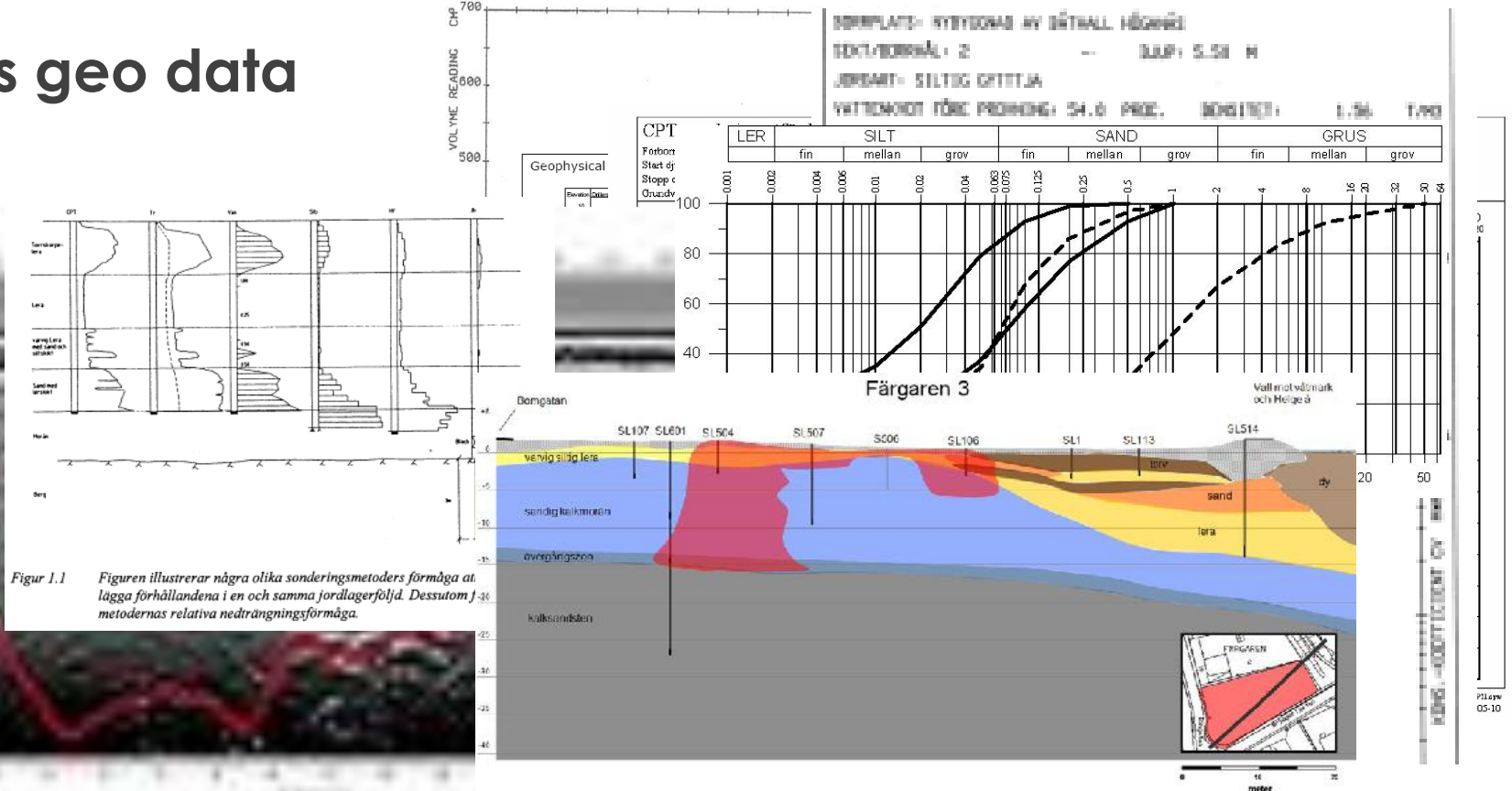
Data GONE!

- Hallandsås 2 x 8 km railway tunnel

This is geo data



This is geo data



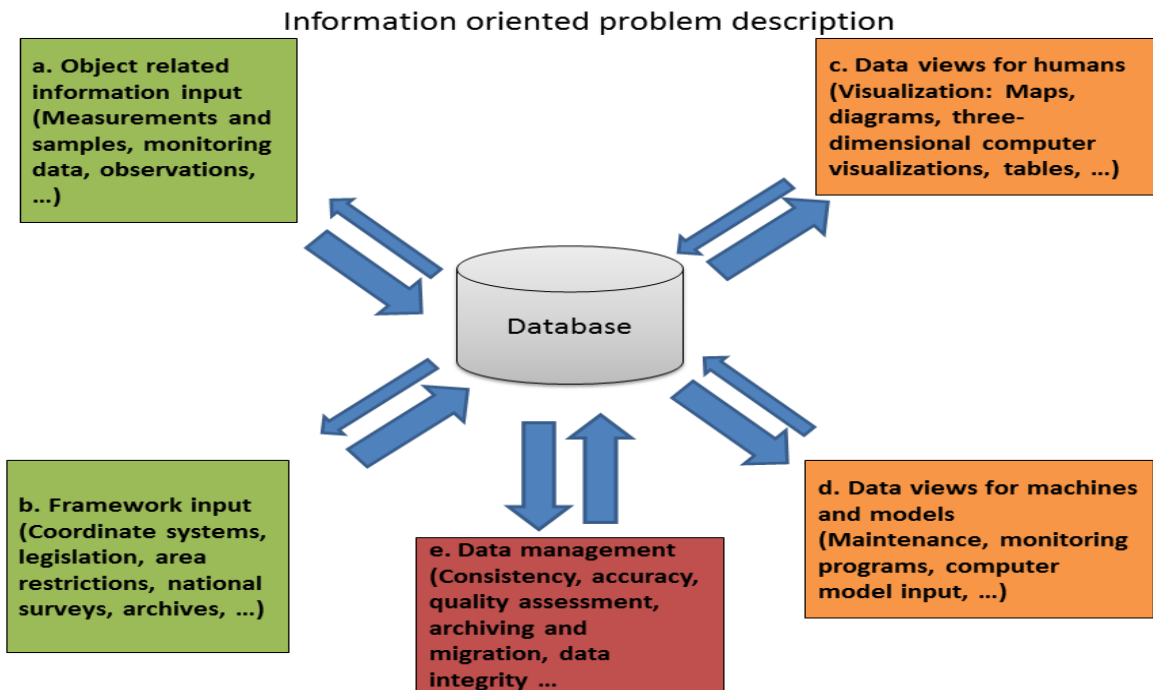
Why complicated?

- Many different data formats
 - AGS data format (handle many but not all data types)
 - in Sweden approx 10 methods (AutoCAD / GeoSuite)
- Lack of standards
- Specific software handle specific data
- No software can handle all data types

- Still a lot of manual work



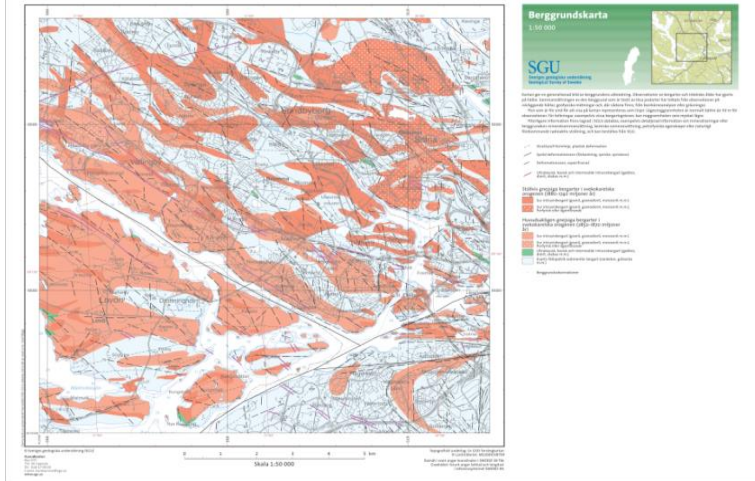
GeoBIM concept needed



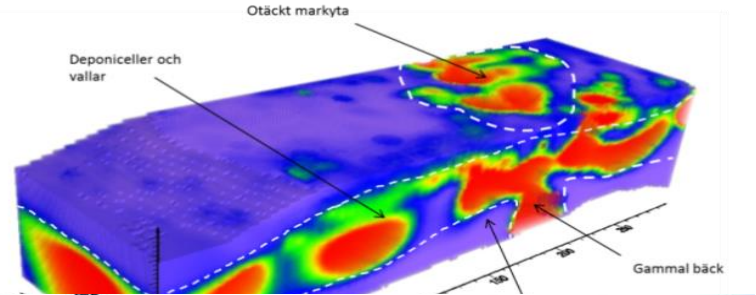
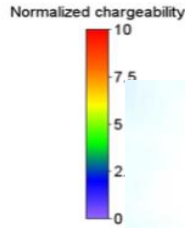
GeoBIM concept needed



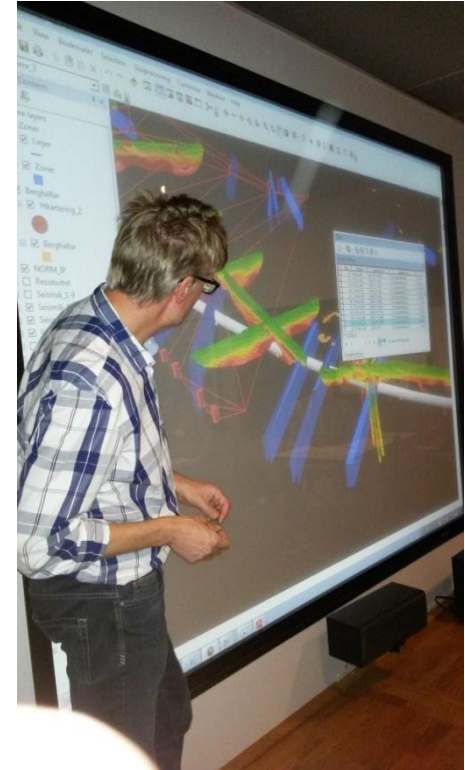
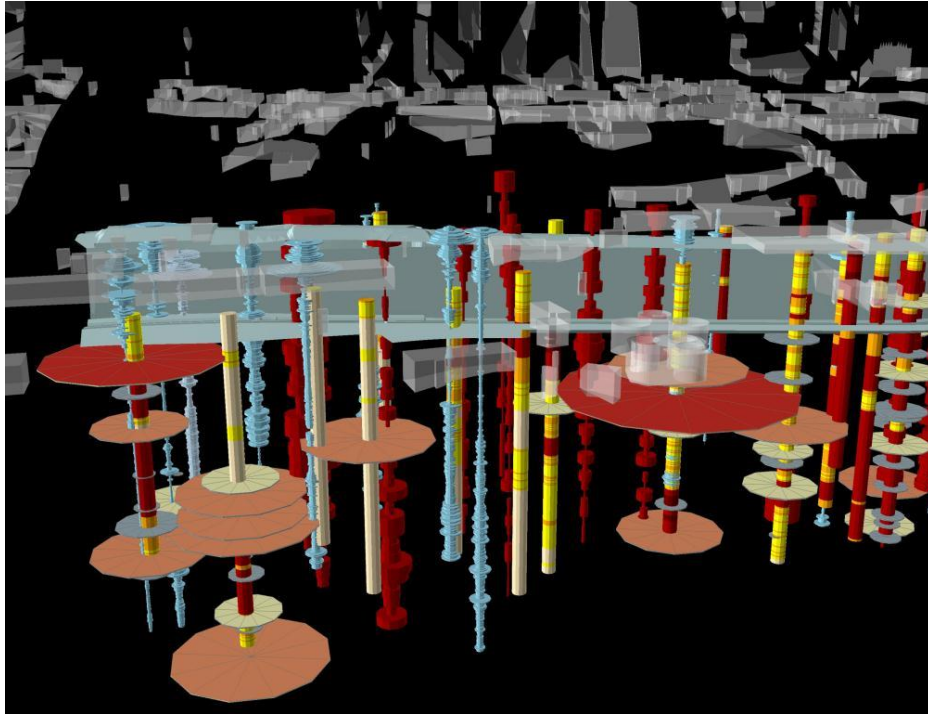
h oriente



data management
consistency, accuracy,
quality assessment,
planning and
operation, data
integrity ...



It could be like this



... or like this...

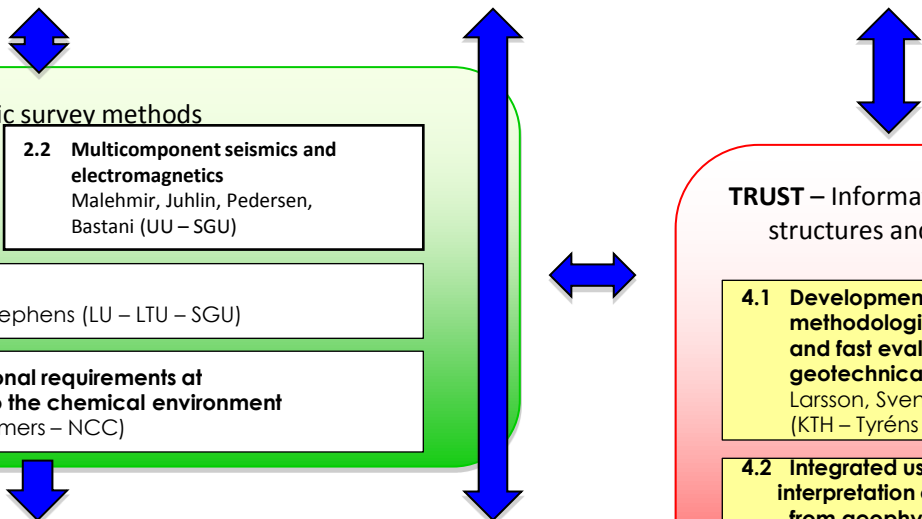
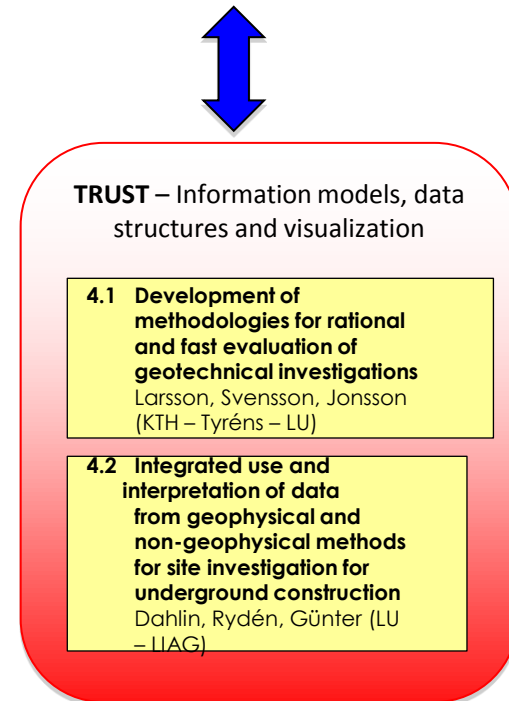
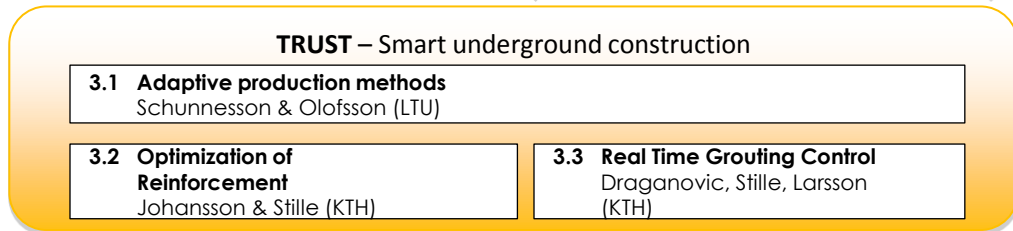
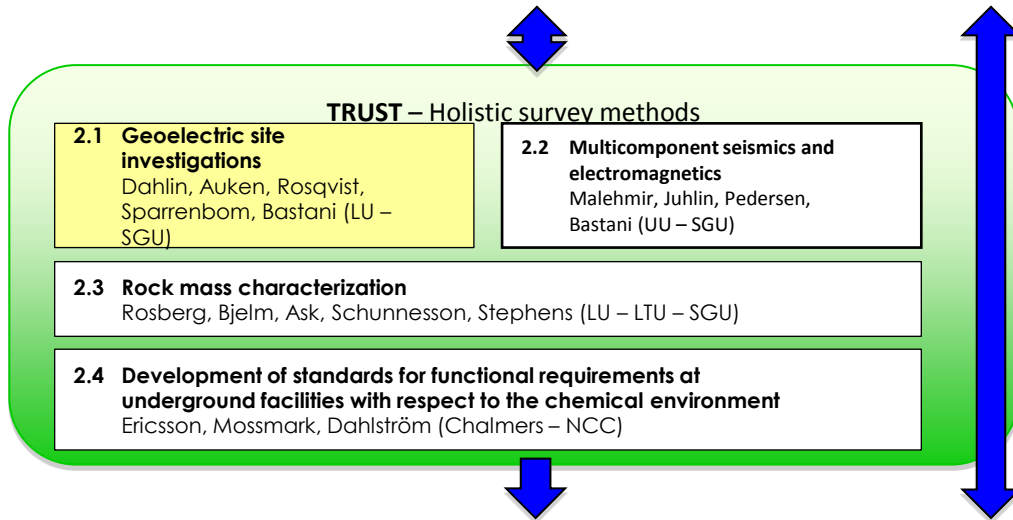
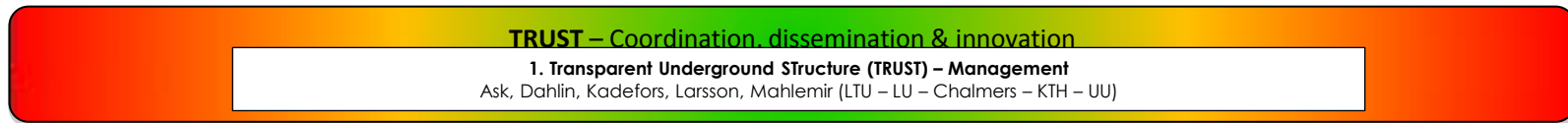
ESS – European Spallation Source

Lund, Sweden



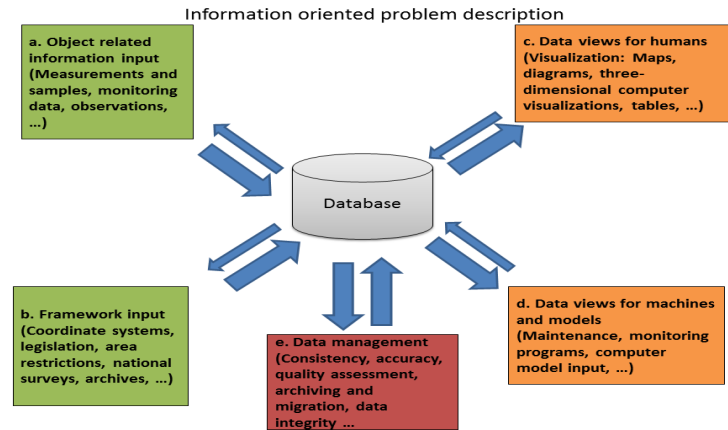
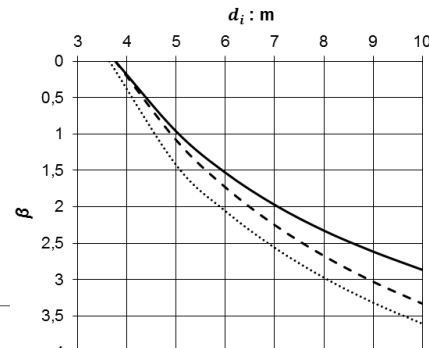
TRUST

Transparent Underground Structure



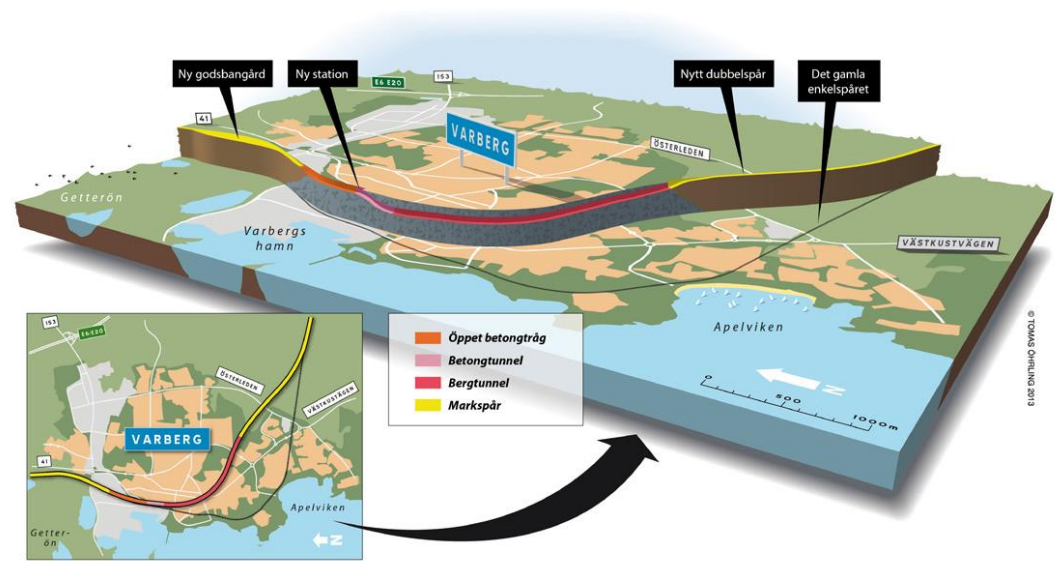
TRUST 4.1 Developing GeoBIM

- Handling ALL geo related data and methods in Infrastructure process
- All data saved with a value of uncertainty
- Make data accessible for all needs/applications
- Visualizing data crucial



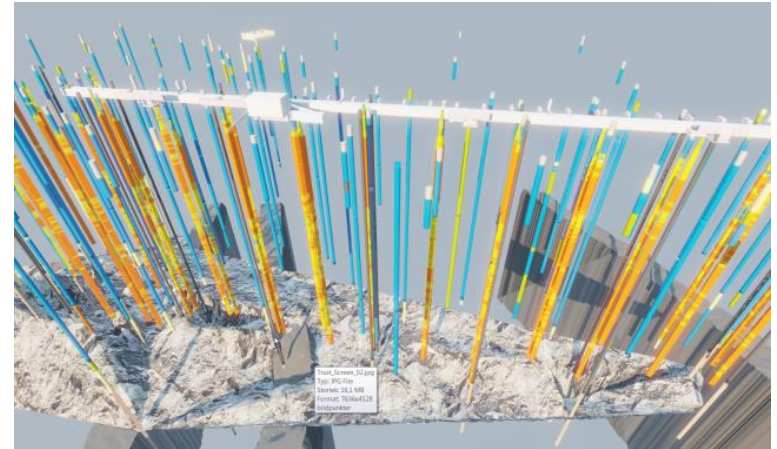
Varberg railway tunnel

- Geophysics visualized in Varberg tunnel

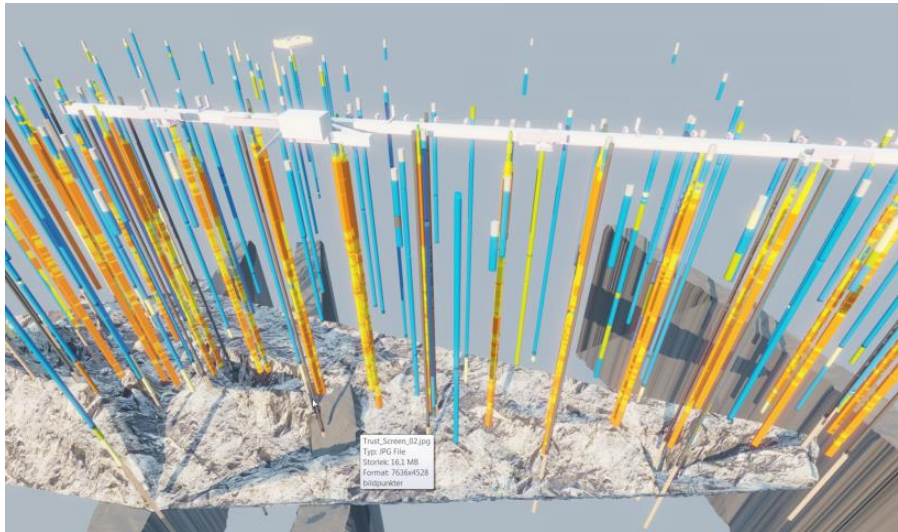


Powerful visualization of GeoBIM

- Large projects – a lot of data
- No tools in geotechnical industry convenient for visualization
- Use cores from computer game industry for real time visualization in 3D

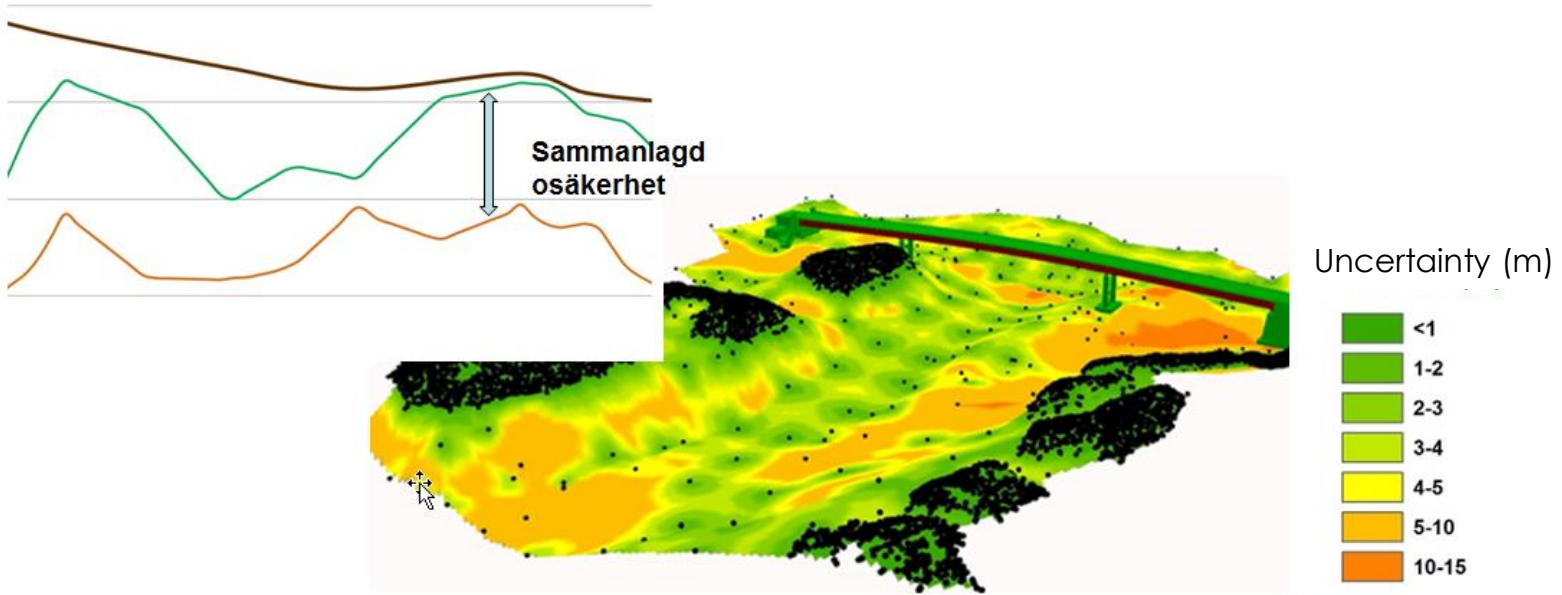


Example European Spallation Source (ESS)





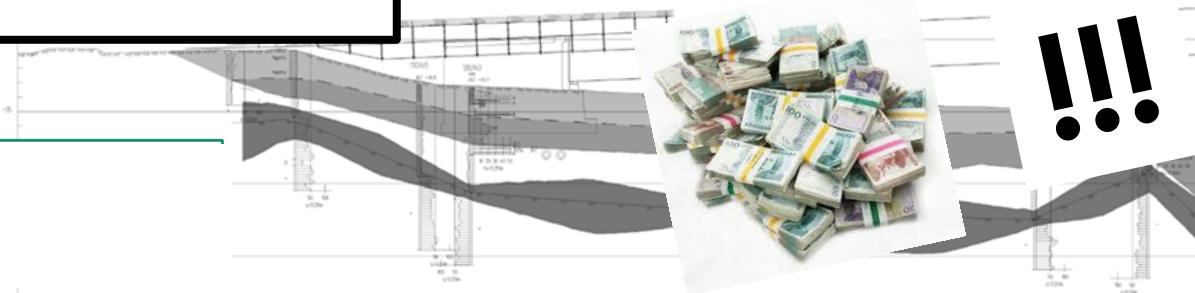
Model of uncertainty





Uncertainty model in tender and contract

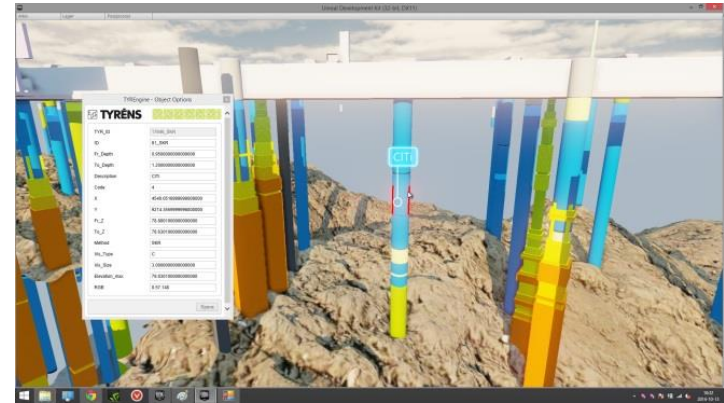
A well defined uncertainty model makes the bedrock model much more useful



With a well defined uncertainty model... ..
the **risk** is defined and could be **shared**

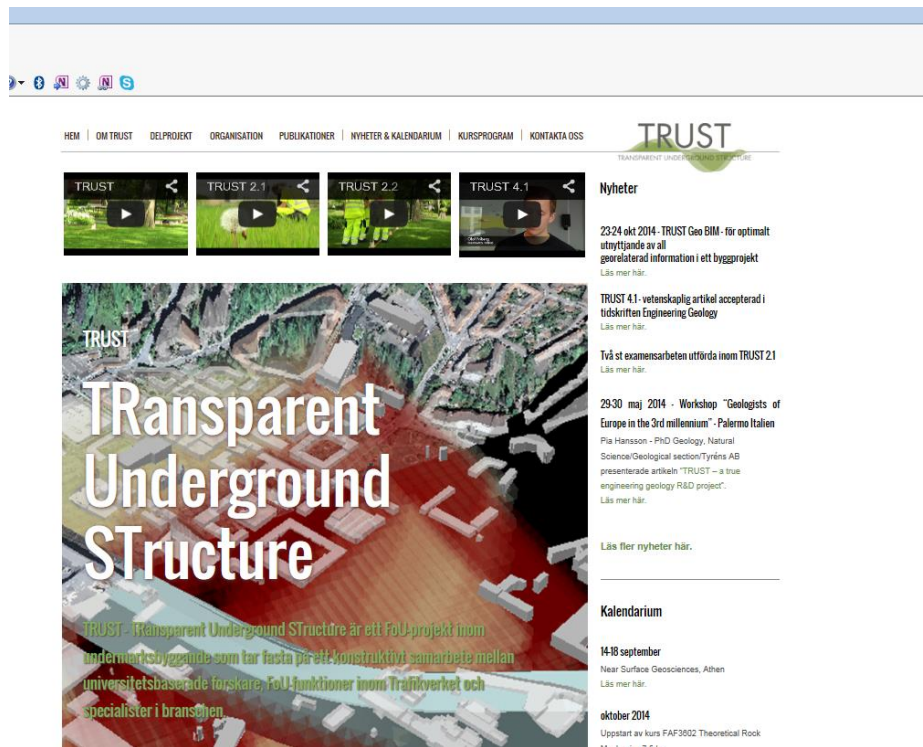
Conclusions

- Many actors – different needs
 - Data often lost
 - A need for data format standard
 - A need for the Geo-BIM concept
-
- Powerful visualization a fantastic COMMUNICATION tool
-
- Uncertainty model – saves a lot of claims and money



Want to know more?

- mats.svensson@tyrens.se
- www.trust-geoinfra.se



The screenshot shows the TRUST website homepage. At the top, there is a navigation menu with links for HEM, OM TRUST, DELPROJEKT, ORGANISATION, PUBLIKATIONER, NYHETER & KALENDARIUM, KURSPROGRAM, and KONTAKTA OSS. Below the menu is a row of four video thumbnails labeled TRUST, TRUST 2.1, TRUST 2.2, and TRUST 4.1. The main content area features a large 3D visualization of an underground structure with the text "TRUST Transparent Underground Structure" overlaid. Below this visualization is a short paragraph in Swedish: "TRUST - Transparent Underground Structure är ett FoU-projekt inom undermarksbyggnad som tar fasta på ett konstruktivt samarbete mellan universitetsbaserade forskare, FoU-funktioner inom Trafikverket och specialister i branschen." To the right of the main content is a "Nyheter" (News) section with three items: "23-24 okt 2014 - TRUST Geo BIM - för optimerat utnyttjande av all georelaterad information i ett byggprojekt", "TRUST 4.1 - vetenskaplig artikel accepterad i tidskriften Engineering Geology", and "Två st examensarbeten utförda inom TRUST 2.1". Below the news section is a "Kalendarium" (Calendar) section with two entries: "14-18 september - Near Surface Geosciences, Athen" and "oktober 2014 - Uppstart av kurs FAF3002 Theoretical Rock Mechanics".

Thank you

www.trust-geoinfra.se

