



wissen wohin  
savoir où  
sapere dove  
knowing where

# Drivers for 3D Developments



Is there a need for official 3D-geodata?

Helena Åström Boss



# Three questions as introduction

Since a few years 3D geodata is a hot topic amongst surveying and GIS-specialists. The technical development in these areas is immense.

- Do we have to incorporate all technical advances in official surveying?
- Is there a real need for official 3D geodata?
- Who are the drivers for 3D developments?



# Content

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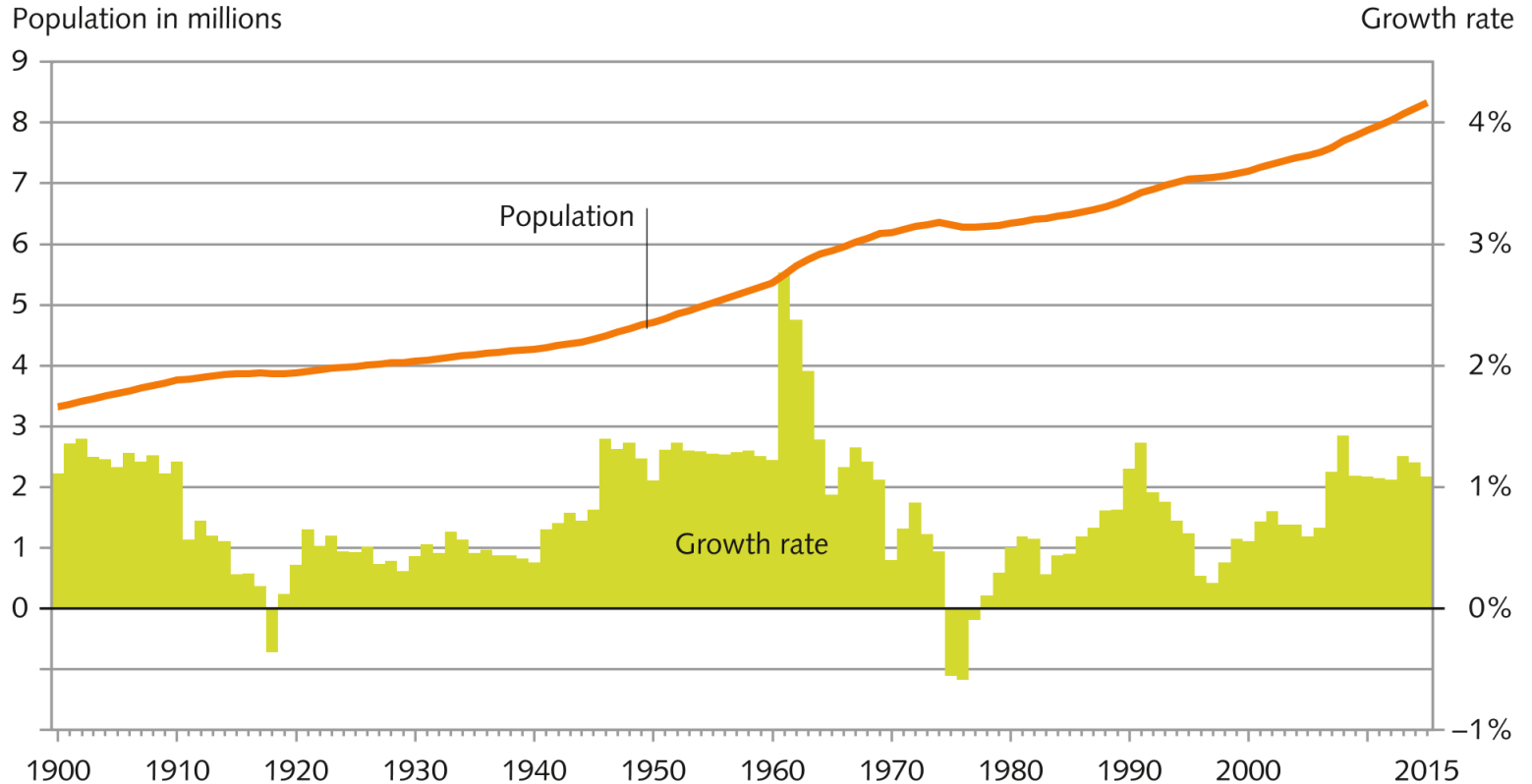


# People and community



# Population growth and size (2015)

## Population growth and size



Sources: FSO – Population census, ESPOP, STATPOP

© FSO, Neuchâtel 2016



# In combination with an increased demand for

- living space per person:

1990 39 m<sup>2</sup>

2016 48 m<sup>2</sup>

Extrapolation 2030 55 m<sup>2</sup>

- area of housing and infrastructure per person:

1980 382 m<sup>2</sup>

2016 407 m<sup>2</sup>

- mobility (daily distance per person):

1994 31.3 km

2010 36.7 km

Extrapolation 2030 45 km

Sources: FSO, ARE



# Swiss Sustainable Development Strategy 2016-2019

## *Urban development, mobility and infrastructure*

*The space occupied by urban development and transport infrastructures has been growing for decades. The result is that Switzerland is losing valuable agricultural land, and nature is suffering from the unrelenting pressure on the landscape. For us humans, less nature means a lower quality of life, and the country's appeal as a tourist destination also suffers.*

*Switzerland's uncultivated and agricultural landscapes should therefore be preserved and largely protected from further development. **Wherever possible, new housing should occupy existing settlement areas.***

→ We need to optimize the use of our habitat.



# How can we intensify spatial use without loss of life quality?

- Plan higher buildings
- Heighten existing buildings
- Take into account of light and shadow
- Minimize noise
- Minimize pollution
- Improve traffic flow (public transport, pedestrians, cars)
- ...

→ This challenge can be fulfilled  
with new technologies and official 3D geodata!





# Technology



# 3D data collection and management

3D data collection by lidar, georadar, drones etc. has become affordable and is now often used

Example:

Point cloud for noise modelling.  
(Source: GROLMUND+PARTNER AG)



## 3D data management

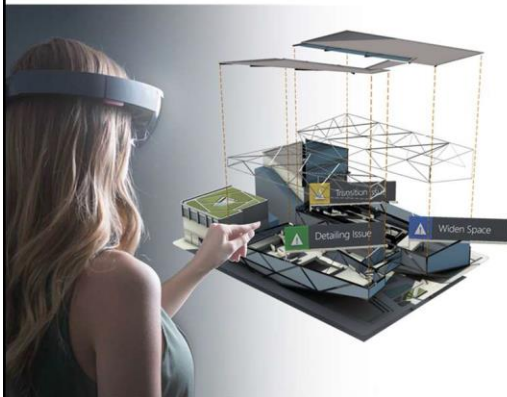
- GIS: in this area the use of 3D geodata is yet not common
- CAD: professional design systems such as Archicad, Vektorworks and AutoCAD, are in use since many years
- Simple design tools such as Sketch-Up and google maps are available to the public
- BIM is coming



# 3D visualization

- 3D pdf is a easy to use file
- Gamers already know 3D virtual reality
- Mixed reality (the combination of real with virtual world) can also be used sensibly in the construction industry

## Anwendungen



- Planung im Bauwesen
- Abbaubetriebe, Kie
- Facility Management
- Vermessung
- Ausführung
- Planen im Bestand

## Begehungen in lebensgrossen Modellen

SketchUp Viewer  
for Hololens



Source: SITECH



# Politics



# The underground – a recurrent topic

Since 2009 there were about 50 parliamentary interventions pertaining to the use of the underground.

Examples:

09.3806 Interpellation Riklin (23.09.2009):

Regelung der nachhaltigen Nutzung des Untergrundes

Regulation of the sustainable use of the underground

09.4067 Motion Gutzwiller (03.12.2009):

Im Untergrund herrscht Chaos. Ergänzung im Raumplanungsgesetz nötig

There is chaos in the underground. An amendment to the federal law on spatial planning is necessary



13.4158 Postulat Bourgois (11.12.2013) :  
Potentiel du sous-sol. Règlement des conflits, gestion et organisation des tâches  
Potential of the underground. Conflict regulation, management and organization of tasks

14.3097 Postulat Schelbert (17.03.2014):  
Rapport relatif aux recommandations de la Commission fédérale de géologie  
Report on the recommendations of the Federal Geological Commission

16.4108 Postulat Vogler (16.12.2016):  
Geologische Daten zum Untergrund  
Geological data on the underground

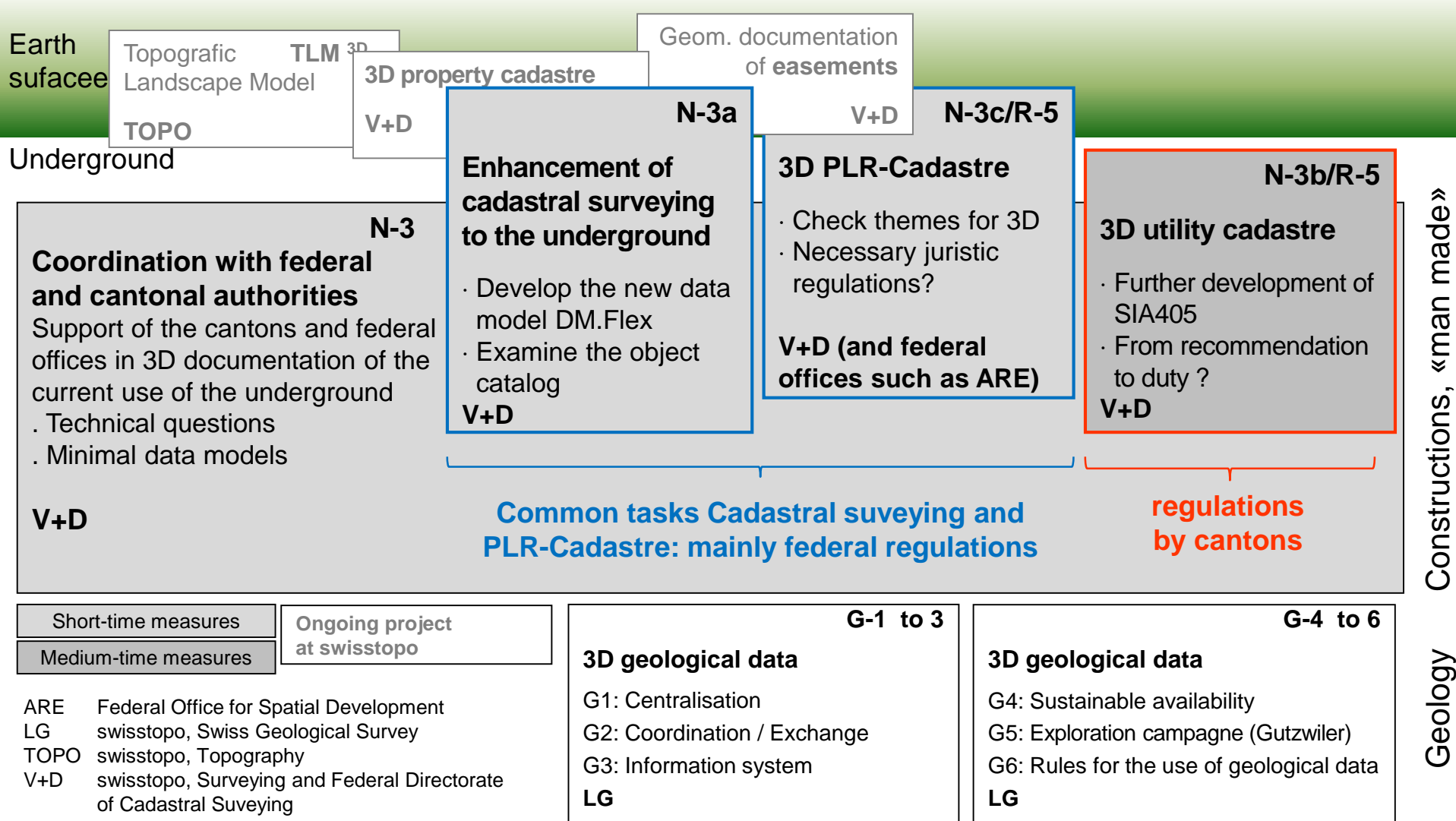


# These political interventions asked for

- Regulations on the use of the underground
- Spatial planning
- Documentation of the use and potentials
- Documentation of the geology

3D geodata was not mentioned explicitly, but indirectly.

# Projects at swisstopo derived from the overview of federal working group underground







# Legal basis



# Legal basis

- Switzerland has an advanced geoinformation legislation.
- The details on the geodata sets are given in the technical legislation, e.g. federal law on spatial planning.
- Hardly any law or regulation mentions whether a geodata set has to be in 2D or 3D.
- If a documentation has to be spatial, it can be assumed that the geodata set has to be in 3D.
- A change from 2D to 3D has to be made only in the data model, which in most cases is a rather technical procedure. It does not demand a decision by the Parliament.



# Conclusions



# Conclusions

- Do we have to incorporate all technical advances in official surveying?  
No, not all, but the essential needs of a majority of our customers, companies and public administration have to be fulfilled.
- Is there a real need for official 3D geodata?  
Yes, many tasks today can only be accomplished with 3D geodata.  
Existing official 3D geodata help companies and public administration manage their tasks efficiently and quickly.
- Who are the drivers for 3D developments?  
We, the ever-growing population who want to keep a high quality of life and needs more space and whose spatial development expands vertically.



# Thank you !

helen.aastroem@swisstopo.ch