

LANDSCAPE ARCHITECTS — BORN TO COORDINATE?



A few words about COWI

COWI Group

- Approx. 6200 employees
- 101 offices worldwide
- 5 regions
- International business lines within:
 - Major bridges
 - Marine structures
 - Tunnels
 - Airports
 - Mapping

COWI Norway

- Approx. 1100 employees
- 24 offices
- 4 divisions
- Market leader within:
 - Major transportation projects
 - Hospitals
 - Sustainable planning
 - Environment

- **LANDSCAPE ARCHITECTURE**

The modern landscape architect, from a personal view

- **PROJECT EXAMPLES**

Leveraged with model-based deliveries

- **FUTURE CHALLENGES**



LANDSCAPE ARCHITECTURE



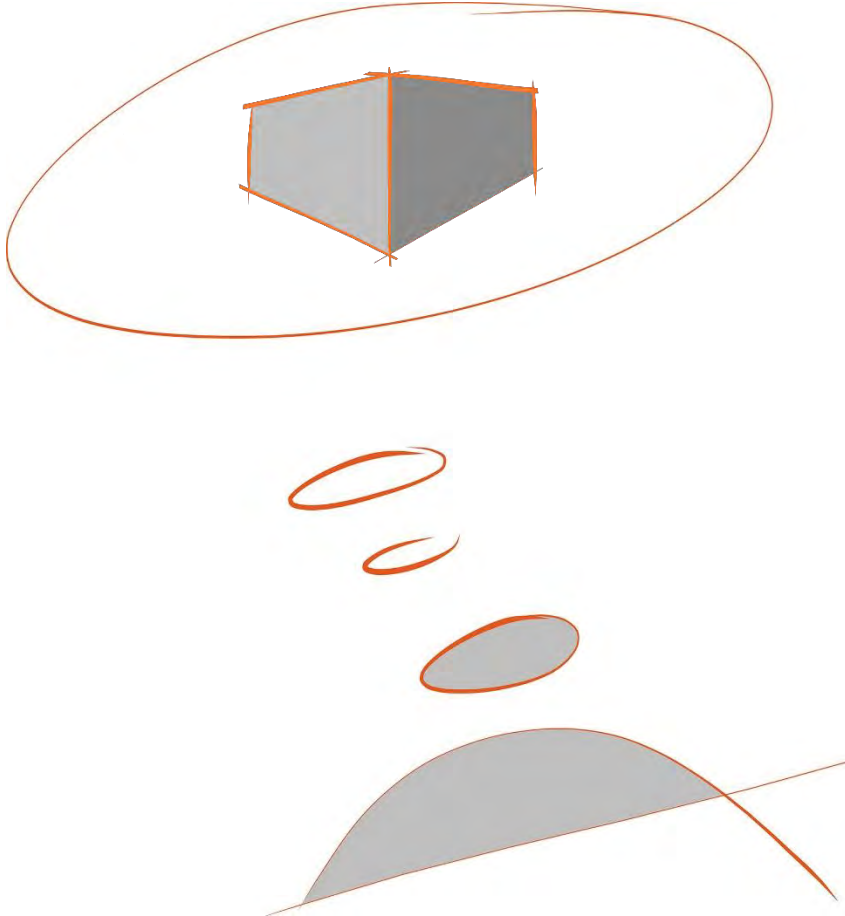
Landscape architects

- how do they think?



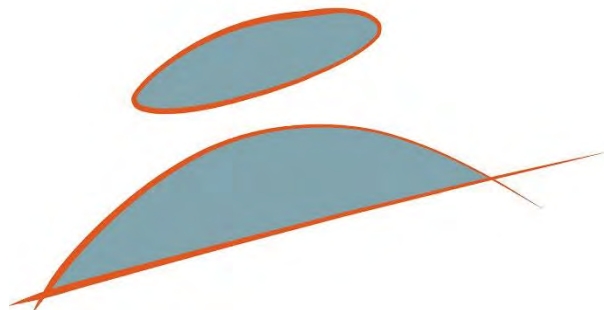
Engineers

- how do they think?



Landscape architects

- what do they learn in school?



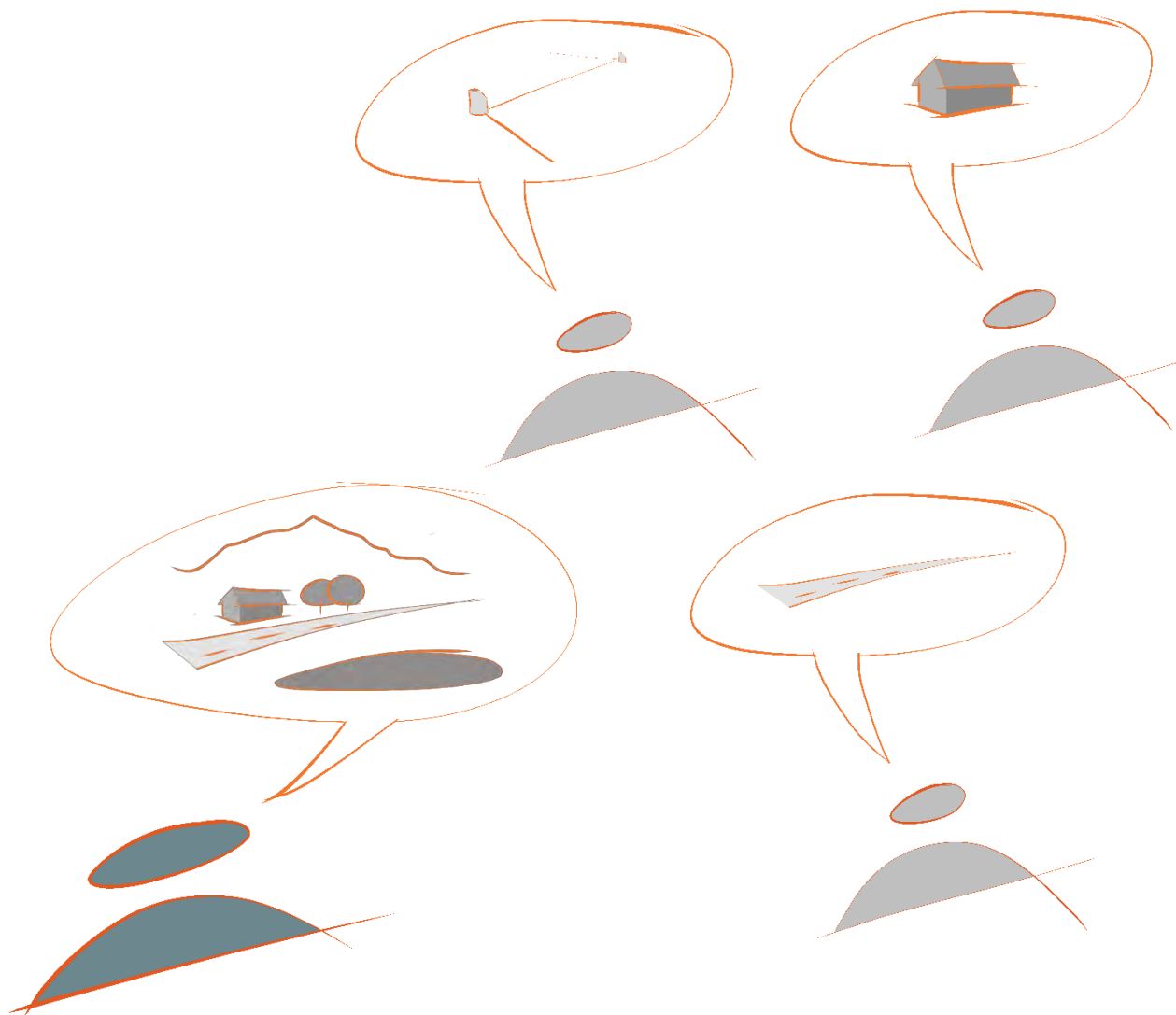
Engineers

- what do they learn school?



In teams...

- how did we traditionally work?



In teams...

- how do we work today?

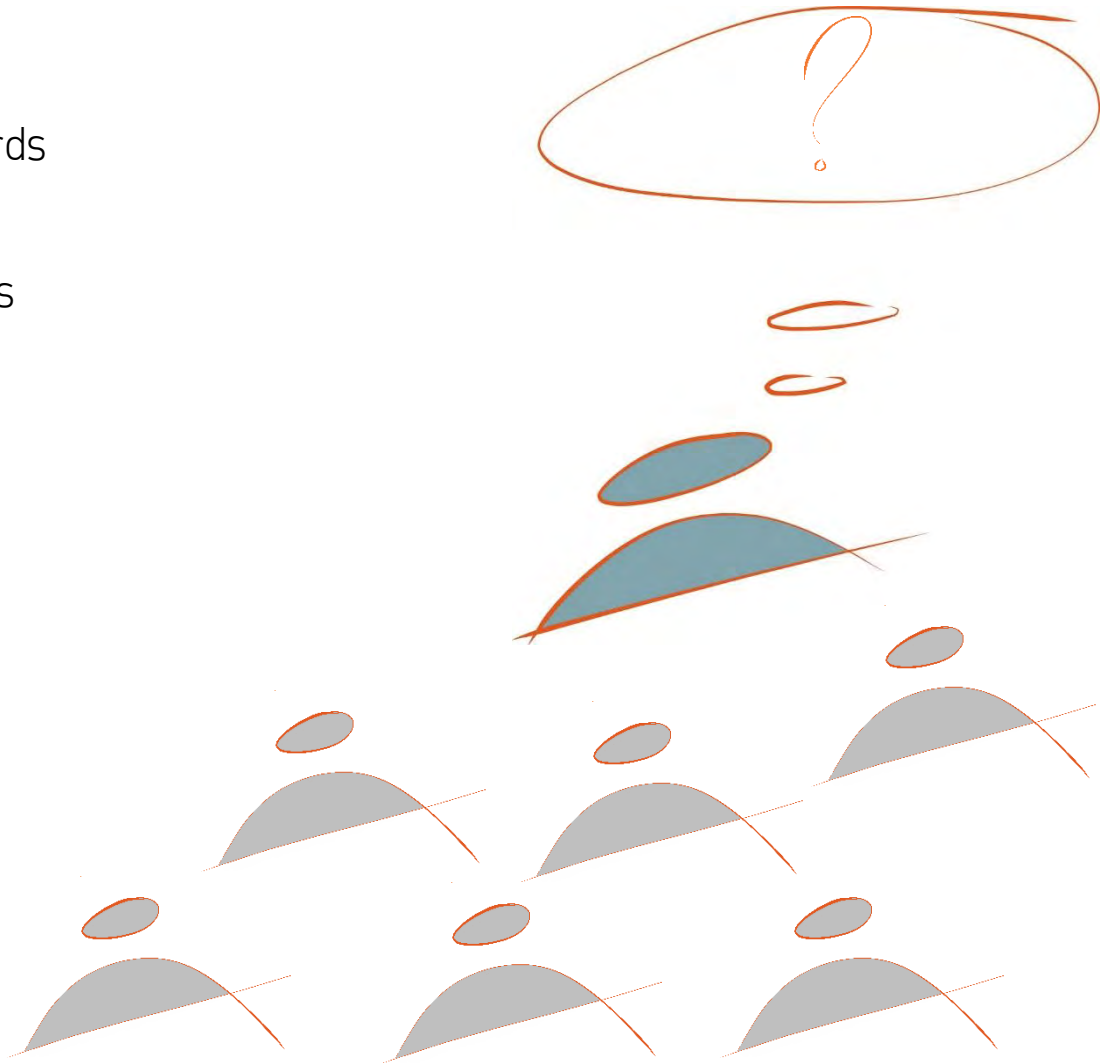


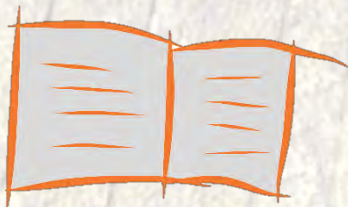
The modern landscape architect...

...has gotten the same role outdoors
as the architect has indoors

How did we get there?

- Standards
- Tools
- Methods





Standards

Norwegian standards

- Based on national proposals, European (CEN) and International (ISO) standards

BIM standards

- Norwegian government building agency (Statsbygg)
- Norwegian Public Roads Administration
- Norwegian National Rail Administration





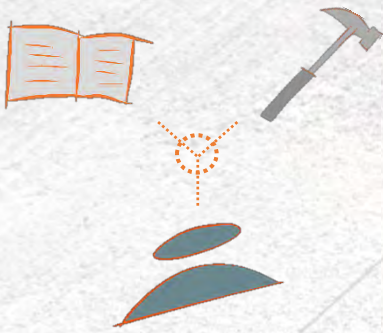
Tools

Design tools:

- Autodesk AutoCAD Civil 3D
- Autodesk Revit
- Autodesk Infraworks
- Novapoint

Collaboration tools:

- Autodesk Navisworks
- Solibri Model Checker



Methods

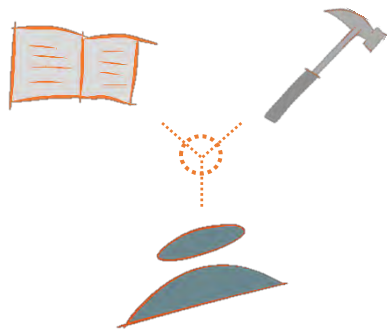
A good method is leveraged by using standards and the right tools, combined with optimal workflows and trained personell.

BIM

- combining geometric models and information in the same model is key

Model collaboration

- to get the full benefit of BIM all disciplines must actively use the model for model enhancement, collaboration and quality checks



Methods



- Drawings
- Geodetic data
- Norwegian Road Data Bank
- Quantity
- Management



PROJECT EXAMPLES



Project examples

Olav Vs street, Klingenberg street
and Haakon VII's street

Client: Oslo Municipality

Challenges:

- Street renewal project in the city centre of Oslo
- Complex infrastructure under ground - lack of accuracy in data
- Drawing based deliveries

Solution:

- Demanded a model-based delivery
- Based on the BIM standard of the Norwegian Public Roads Administration



Project examples

Olav Vs street, Klingenberg street
and Haakon VII's street

Tools:

- Autodesk AutoCAD Civil 3D
- Novapoint 18.20
- Autodesk Navisworks
- Lumion





Project examples

Olav Vs street, Klingenberg street
and Haakon VII's street

Benefits:

- Good communication with the customer
- Clash detection and quality checks
- Great coordination tool for the project manager
- Easy understandable for the contractor





Project examples

E16 Nybakk - Slomarka

Client: National Public Roads Administration

Challenges:

- The biggest design contract given to a team within Norwegian infrastructure projects
- 60 persons in the team - 6 subconsultants
- 32 km highway design
- Crossing 3 municipalities and 2 counties

Solution:

- Common and easily understandable tools for the whole design team
- Model server - "one single point of truth"
- Based on the BIM standard of the customer



Project examples

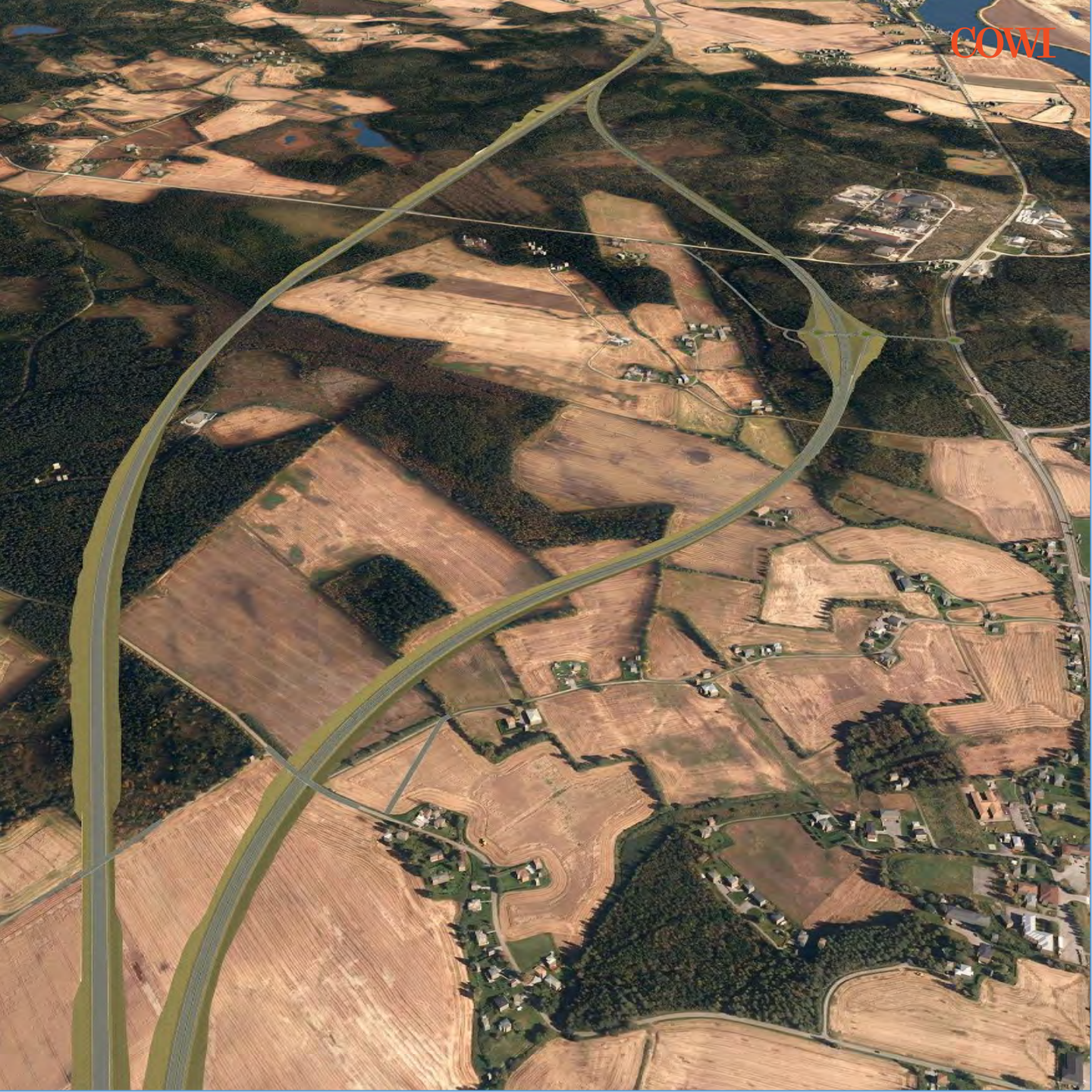
E16 Nybakk - Slomarka

Tools:

- Autodesk Infracore 360
- Autodesk AutoCAD Civil 3D
- Novapoint 19.20

- Quadri Model Server
- Infracore 360 Cloud Solution







Project examples

E16 Nybakk - Slomarka

Benefits:

- Connected 3D and GIS in one tool
- Worked with BIM models from day 1
- Easy to visualize and evaluate consequences
- Good model management and quality checks

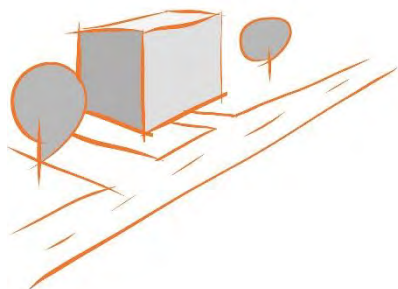
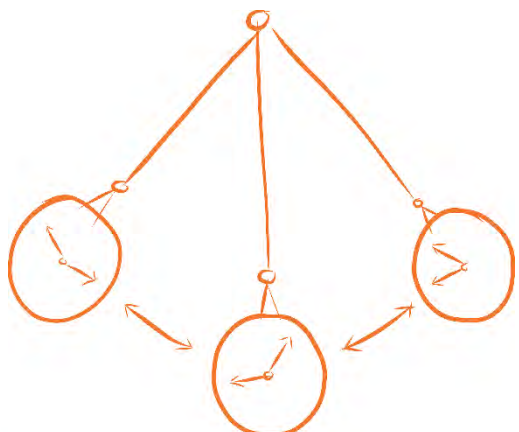
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FUTURE CHALLENGES

Different workflows



Buildings



Infrastructure



Landscape

Standardize

Landscape architects take a big part in early planning phases and often borrow objects from other disciplines to transfer them back in the design phase - we need to get more focus on what's ours...

The motivation is:

Standard objects = Better tools



Better tools = More effective processes



More effective processes = More time to create the good designs
...or save money

The rise of BIM within landscape architecture

- 2009: The master's thesis of a landscape architect
- 2010: A specialist group with participants from various design offices and consultants was formed - with links to the [Norwegian Landscape Architects Association](#)
- 2010 - 2012: With great interest and on voluntarily basis the group tried to influence [buildingSMART Norway](#) and the [Building and Construction Network \(BAnettverket\)](#) in their work for better collaboration

2012: Information model for landscape architects

Pilot project for the **Norwegian governmental building agency (Statsbygg)** investigating the possibility of standardizing the objects used by landscape architects

- Maps different kinds of standards used in the building and construction industry in Norway, as well as European and International standards
- Suggests to establish a common feature catalogue for the different landscape objects - with examples on how to proceed
- Looks at the different exchange formats which is used by the industry and suggests different development step
- The project is placed at: www.underland.no



2014: SOSI for Landscape architecture

A standardization project run by the **National Mapping Authority** and the **Building and Construction Network (BA-nettverket)**, with voluntary support from approx. 25 different companies.

- Main focus is to establish a new feature catalogue for Landscape architecture, based on the SOSI standard.

SOSI = Samordnet Opplegg for Stedfestet Informasjon
Joint System for Localized Information



Based on ISO/TC211 Geographical Information

- The project is based on the work from 2012 - Information model for Landscape architects

2054: Smart Cities?



The [World Economic Forum](#) estimates that we will have to build the same urban capacity (housing, infrastructure and facilities) in the next 40 years that we have built over the past 4,000 years.

To get there we need to be coordinated - and standardize as we proceed...

Questions?

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