Rijkswaterstaat
Ministry of Infrastructure and the Environment

Implementing national geo-standards within BIM

Remco in ‘t Hout (RWS)
Menno van der Veen (Arcadis)

Content

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- BIM application
- National geo-standards – IMGEO
- Findings and conclusions
- Question

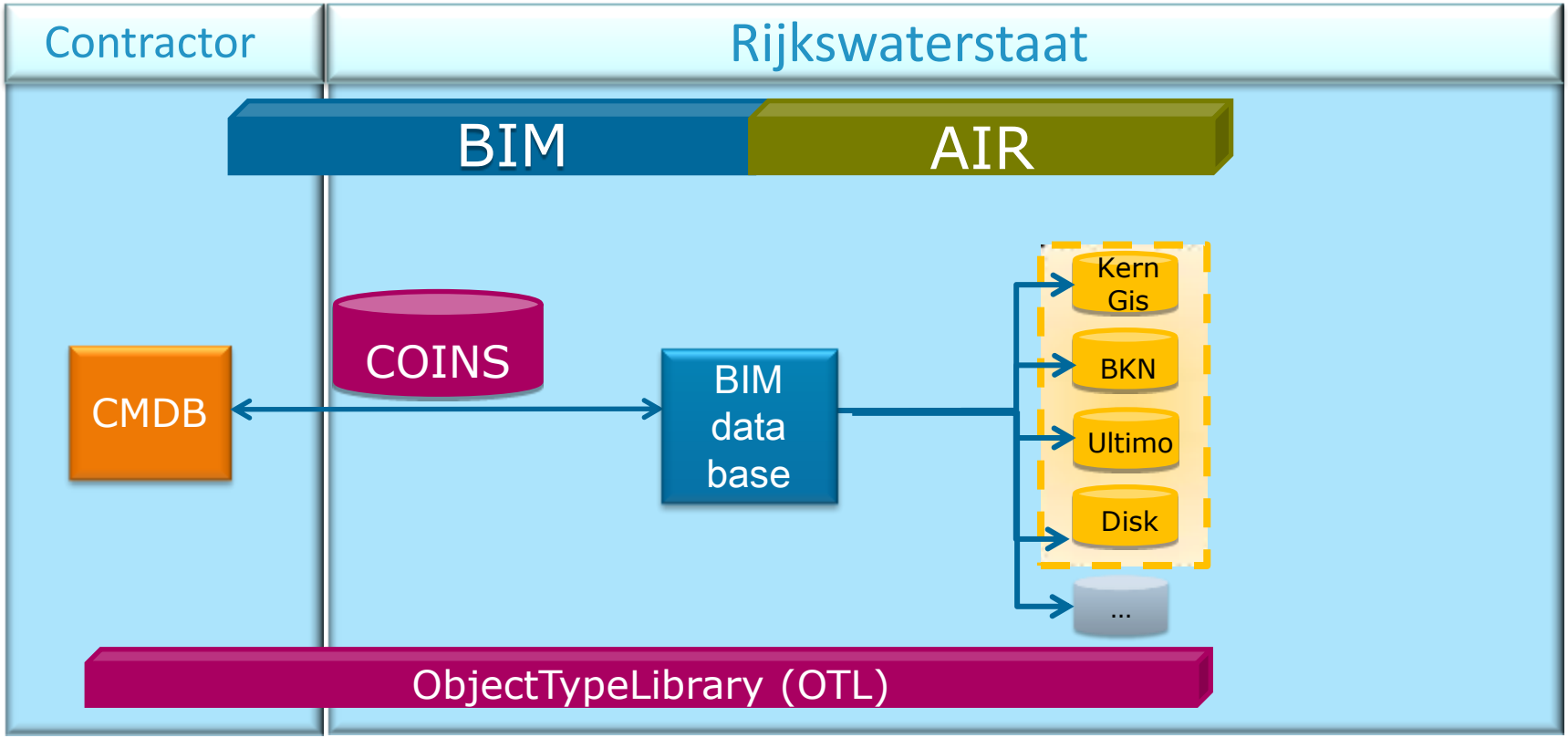
Rijkswaterstaat

- Rijkswaterstaat is responsible for the **design, construction, management and maintenance** of the main **infrastructure** facilities in the Netherlands. This includes the main **road** network, the main **waterway** network and **water** systems.

- Rijkswaterstaat is consolidating it’s information systems in order to achieve a more efficient information/business process.

- Big parts of this consolidation are:
  - BIM
  - AIR
- Standardized according to:
  - National (geo-)standards

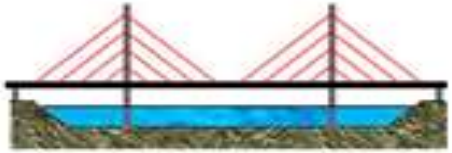
Information delivery process



OTL definition

ObjectTypeLibrary

A digital description of *generic, reusable concepts* in an ontology relating to the physical, built environment.

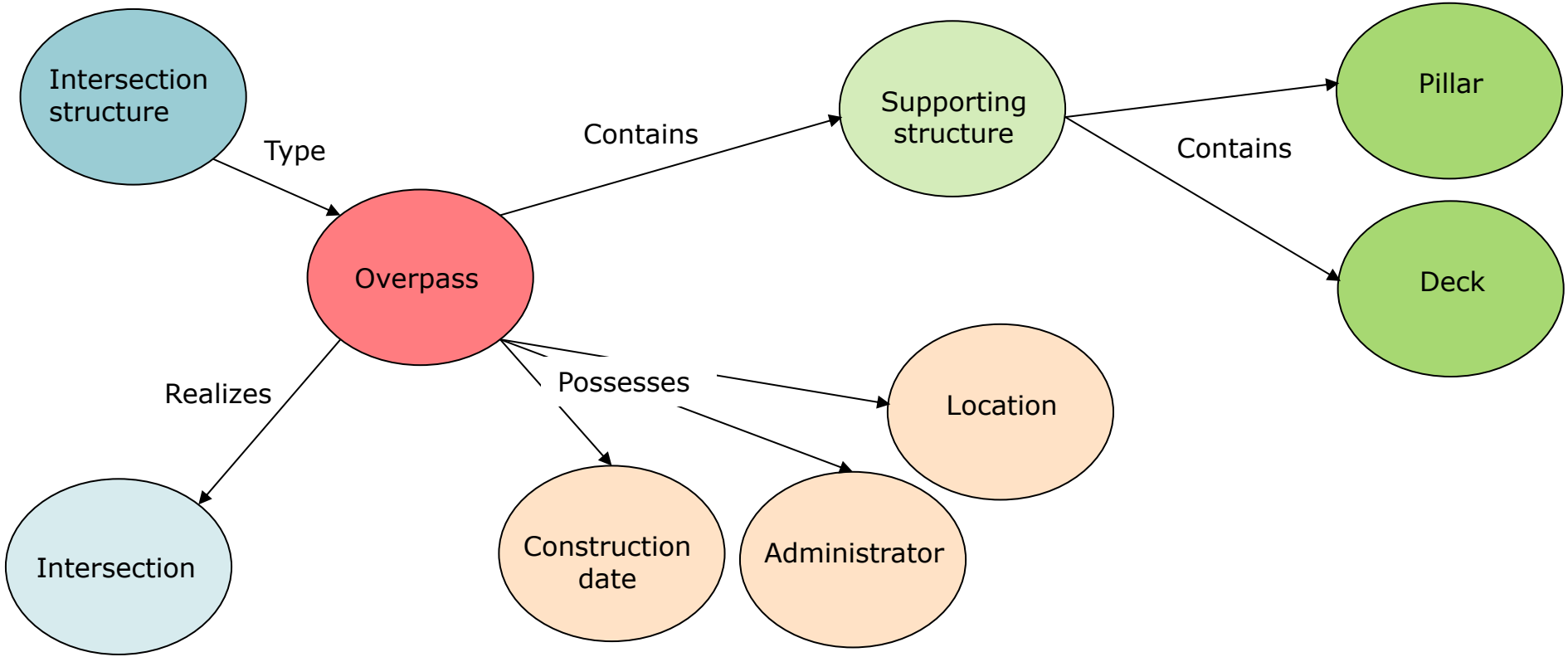


OTL Concept:
"Cable Bridge"

Real world object:

"Martinus Nijhoff bridge"

OTL semantics



OTL data

- Data is:
  - Object oriented; quantifiable, easily queried
  - Semantically rich; explicit relations and attributes
  - Georeferenced

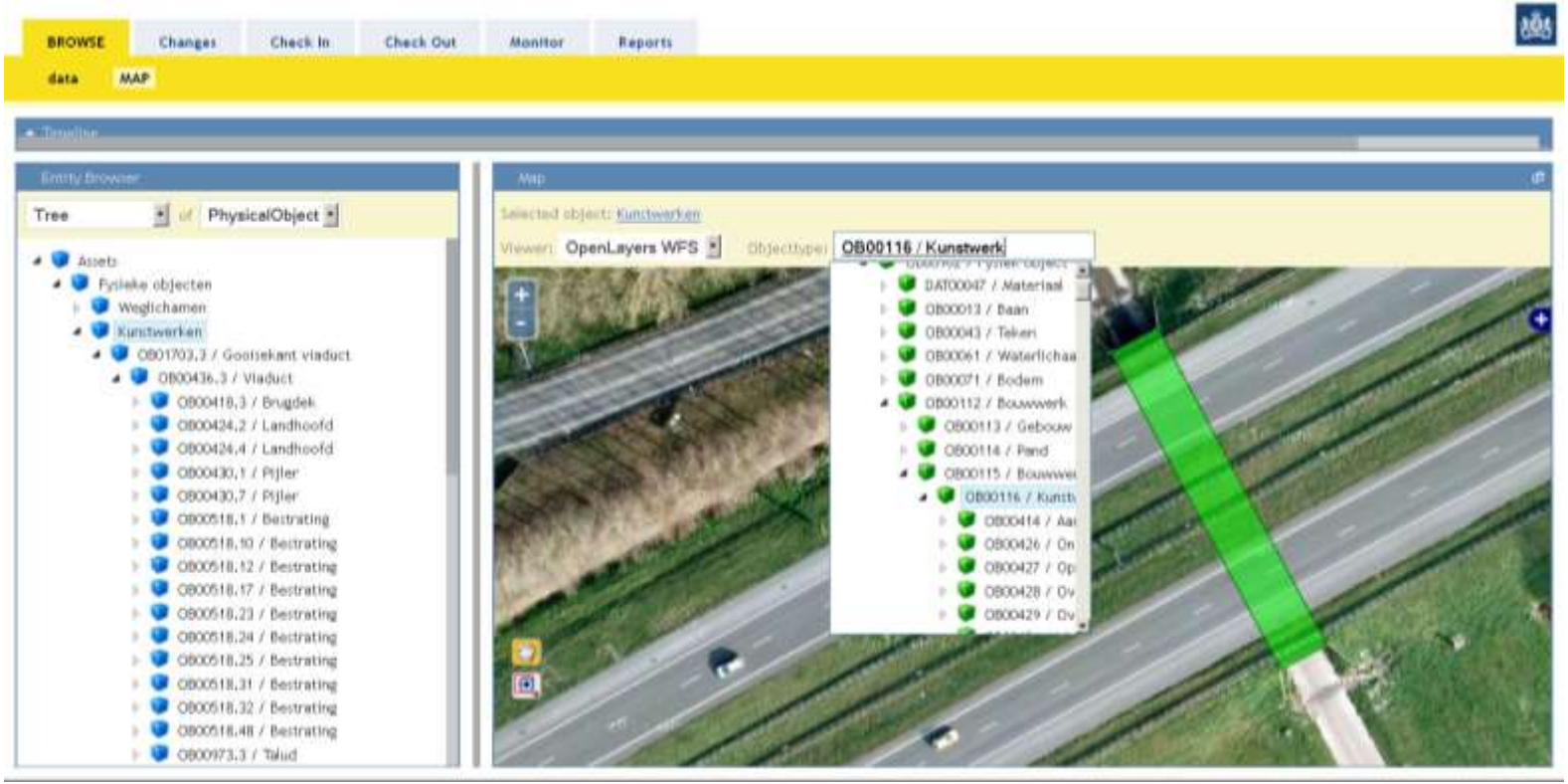
- Data is used for:
  - Asset management
  - Cost calculation
  - Long term maintenance planning
  - Performance monitoring
  - Planning and design

OTL projects

- Structured data exchange
  - > 10 projects actively using the OTL
  - Data delivery; 3 month interval
  - Improving data quality

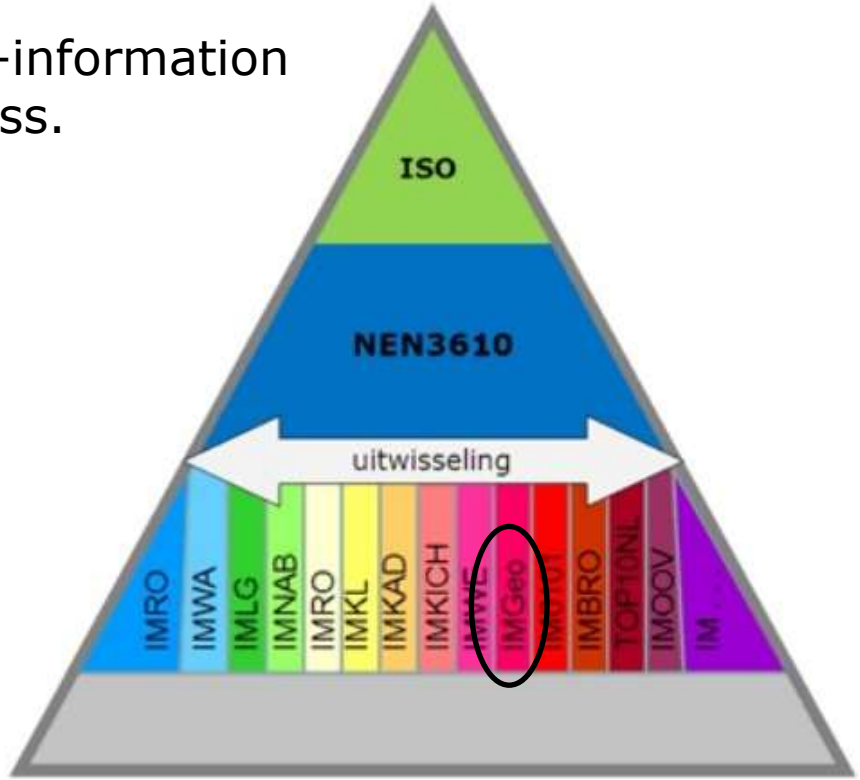
- Combining development and project application presents challenges.

Example


BROWSE
Changes
Check In
Check Out
Monitor
Reports
data
MAP
Entity Browser
Tree
of
PhysicalObject
Assets
Fysieke objecten
Weglichamen
Kunstwerken
OB01703,3 / Goorsekant viaduct
OB00436,3 / Viaduct
OB00418,3 / Brugdek
OB00424,2 / Landhoofd
OB00424,4 / Landhoofd
OB00430,1 / Pijler
OB00430,7 / Pijler
OB00518,1 / Bestrating
OB00518,10 / Bestrating
OB00518,12 / Bestrating
OB00518,17 / Bestrating
OB00518,23 / Bestrating
OB00518,24 / Bestrating
OB00518,25 / Bestrating
OB00518,31 / Bestrating
OB00518,32 / Bestrating
OB00518,48 / Bestrating
OB00973,3 / Talud
Map
Selected object: Kunstwerken
Viewer:
OpenLayers WFS
Objecttype:
OB00116 / Kunstwerk
DAT00047 / Materiaal
OB00013 / Baan
OB00043 / Teken
OB00061 / Waterlichaa
OB00071 / Bodem
OB00112 / Bouwwerk
OB00113 / Gebouw
OB00114 / Pand
OB00115 / Bouwwe
OB00116 / Kunst
OB00414 / Aa
OB00426 / On
OB00427 / Op
OB00428 / Ov
OB00429 / Ov

National geo-standards

- The government is standardizing geo-information for a more efficient information process.
- The goal:
  - single gathering of data
  - multiple use of data
- Governmental organizations are obliged to create, use, check and correct the data according to these geo-standards.



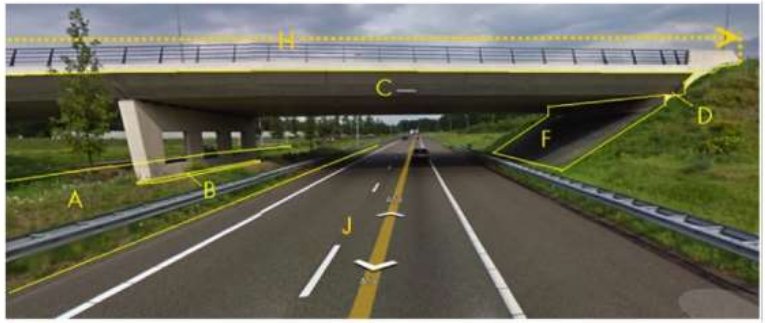
IMGEO

- Wegdeel
- OndersteunendWegdeel
- Spoor
- OnbegroeidTerreindeel
- BegroeidTerreindeel
- Waterdeel
- OndersteunendWaterdeel
- Pand
- OverigBouwwerk
- Overbruggingsdeel
  - inwinningsregel BGT
  - inwinningsregel IMGeo
  - overbruggingsdeel
  - brug (niet BGT)
  - aquaduct (niet BGT)
  - viaduct (niet BGT)
  - ecoduct (niet BGT)
  - flyover (niet BGT)
  - dek (niet BGT)
  - landhoofd (niet BGT)
  - pijler (niet BGT)
  - sloof (niet BGT)
  - pyloon (niet BGT)
- Tunneldeel

viaduct (niet BGT)

Definitie:
Kunstwerk over een weg, spoorweg of terreinverdieping, bestaande uit een dek gesteund door pijlers en/of landhoofden.
(bron: definities.geostandaarden.nl)

Verplicht? Nee, optioneel want IMGeo-object



H:

Attribute name	Attribute value
typeOverbrugging	viaduct
relatieveHoogteligging	1

‹ aquaduct (niet BGT) omhoog ecoduct (niet BGT) ›

IMGEO

- Defines object types
- Adds attributes and relations
- Instructions for geometry

- Goal IMGEO in OTL:

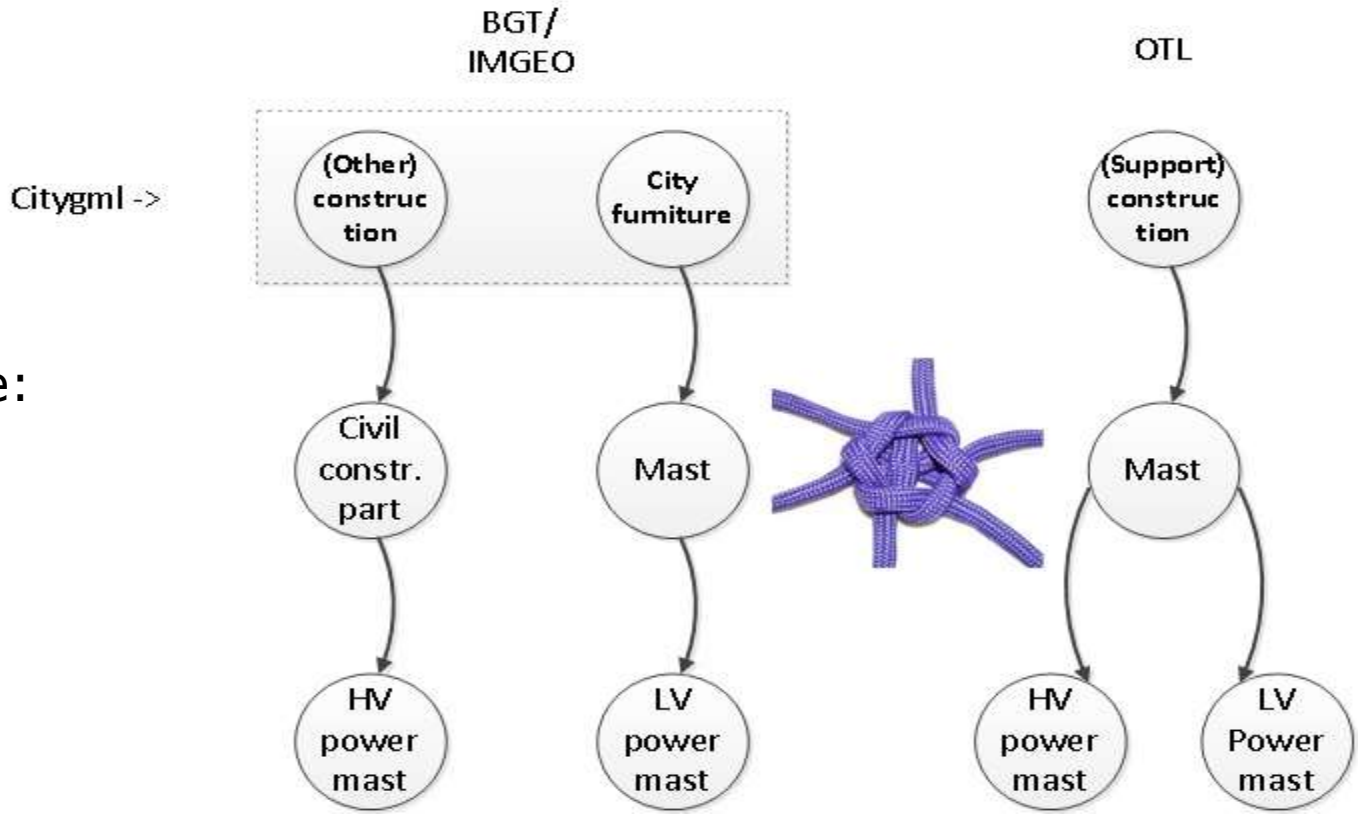
  Maximum efficiency by gathering data directly based on IMGEO. Complex and costly transformations to fulfil IMGEO obligations are avoided.

  Extra data necessary for Rijkswaterstaat is gathered via extra object types and rules in OTL.

Relating IMGEO - OTL

Definitions
and
Taxonomy

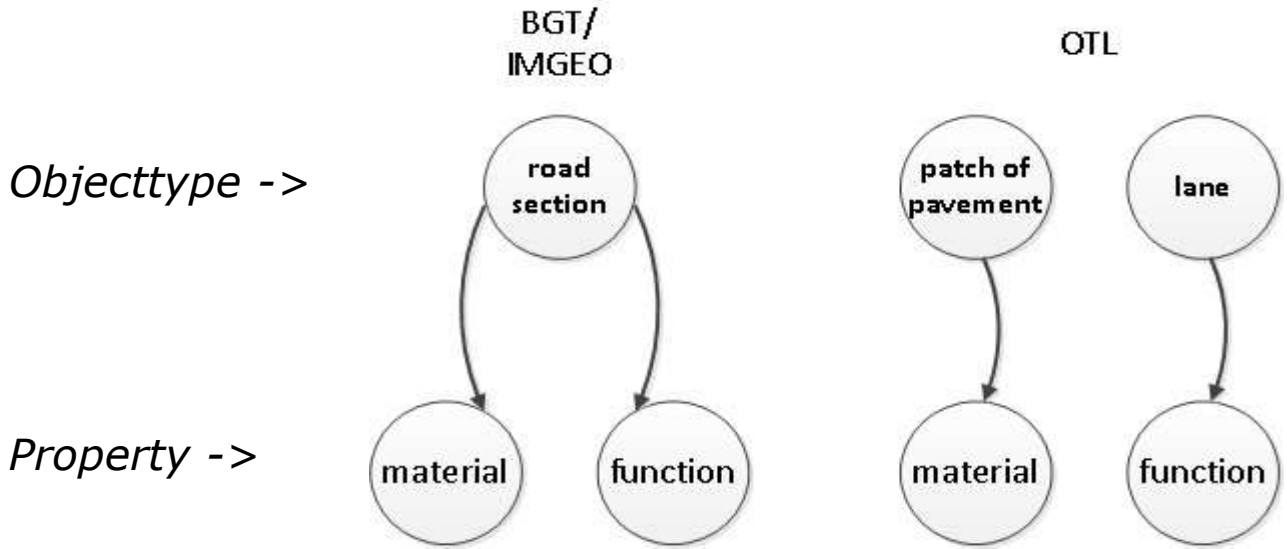
Questions soon rise:



Relating IMGEO - OTL

- Road section

One object type
or two?



Semantic mapping

- Issue: Difference in modelling approach
  - IMGEO is a consensus model with focus on making a map
  - OTL is a semantic model, built with strict rules. Business has limited influence. Geometry is not a factor.

Conclusion

- Implementing national geo-standards within BIM is possible
- Issues remain to be resolved by either changing the OTL or IMGEO. Other issues may have to be resolved with the data itself. Neither is easy.
- What is ideally gained:
  - Data exchange becomes easier by being compliant with national and international (Citygml) standards.
  - Data gathering and future use is optimized.
  - Future 3D developments will be easier to implement.

Question

Does complying with existing geo-standards make life easier for asset managers?