Enhancing the Assetmanagement Life Cycle using BIM and GIS

GeoBIM – BIM for Transportation

Niels Reyngoud

provincie Gelderland

Provincie Gelderland | 1 december 2016

Province of Gelderland

1.200 km roads
1.400 km bike roads

84.000 trees
14.700.000 m2 grass

540 bridges, tunnels, overpasses
6.000 culverts
30 km acoustic screens

20.000 lamp posts
190 traffic light controls
242 traffic measurement systems
24 camera systems

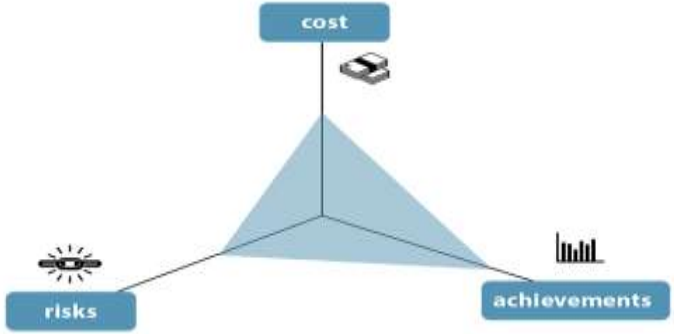
780 bus stops
16 carpool sites
110 gas stations

Developments in road management

- Budgets shrink
- Pressure for smaller government
- Pressure for more transparency (why do we do the things we do)
- Bigger accent on life cycle management
- Shift from active to more directing rol of our department

- Answer: implementation of asset management!

Asset Management – How?



Asset Management Life Cycle

Importance of information management

Essential in asset management:

- Actual, complete and sound data
- Use data to find the balance between costs, risks and achievements
- Gather data just once, at the ‘source’ and then use it throughout the whole life cycle
- We realise that information management should have a dominant place in all of our processes

Information management using GIS and BIM is the heart of the asset management life cycle!

Examples of GIS and BIM in the life cycle

How we use GIS and BIM in the life cycle:

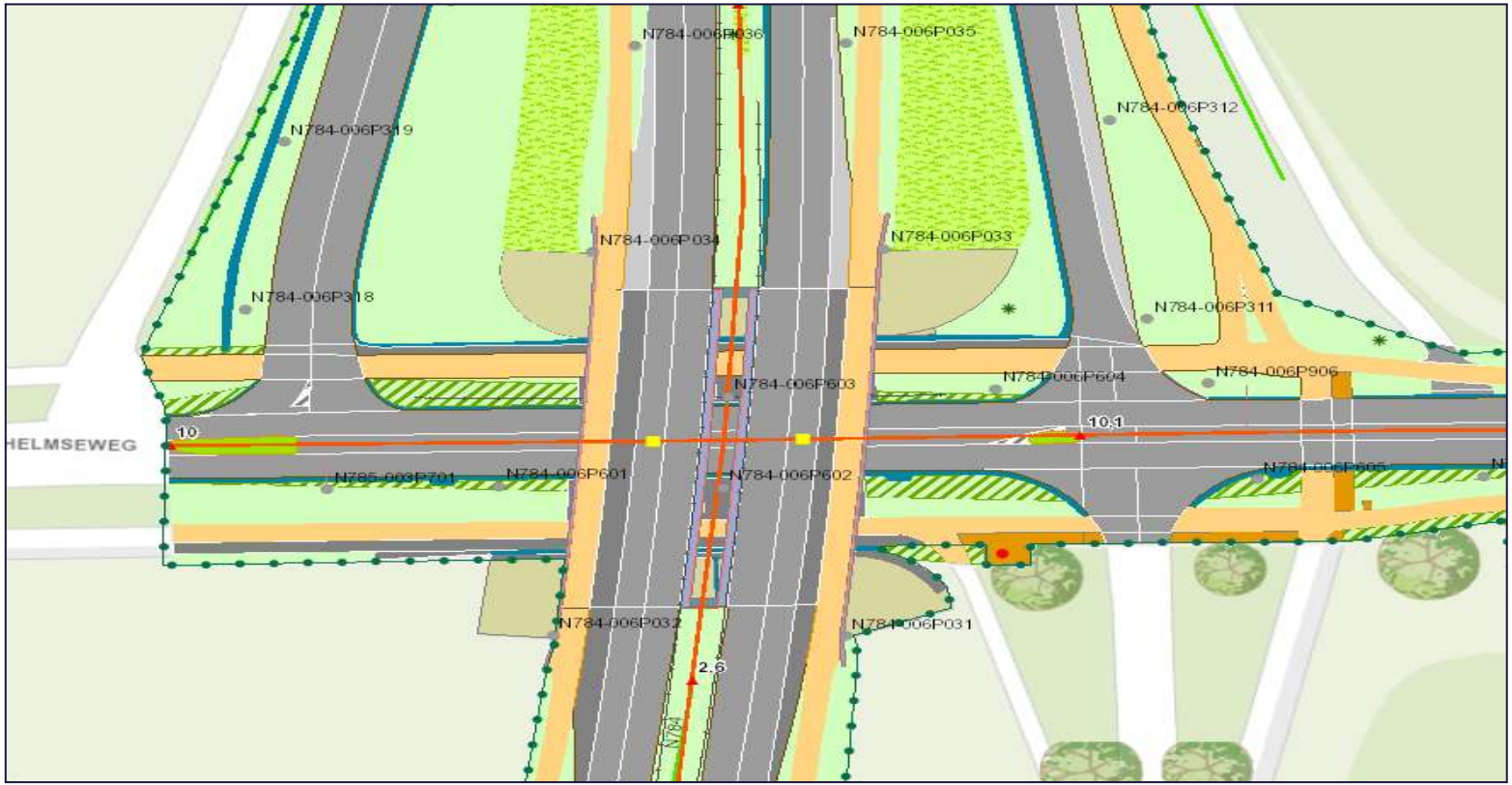
1. Project information management
2. IMGeo basemap as the source for all data
3. Gelderland Object Type Library (OTL)
4. Using COINS to keep data actual and complete
5. Using COINS 2.0 in maintenance projects

1. Project information management

- Using an information system from the first phase of the project
  1. Relatics
     - system breakdown structure
     - customers and system requirements
     - risk management
     - issue management
  2. iViewer (GIS viewer)
     - Location of cables
     - Land use plans
     - System boundaries
     - Traffic models
     - Design alternatives
- Both systems are coupled and function as one
- Users are very enthusiastic; they have all the information they need in one systems

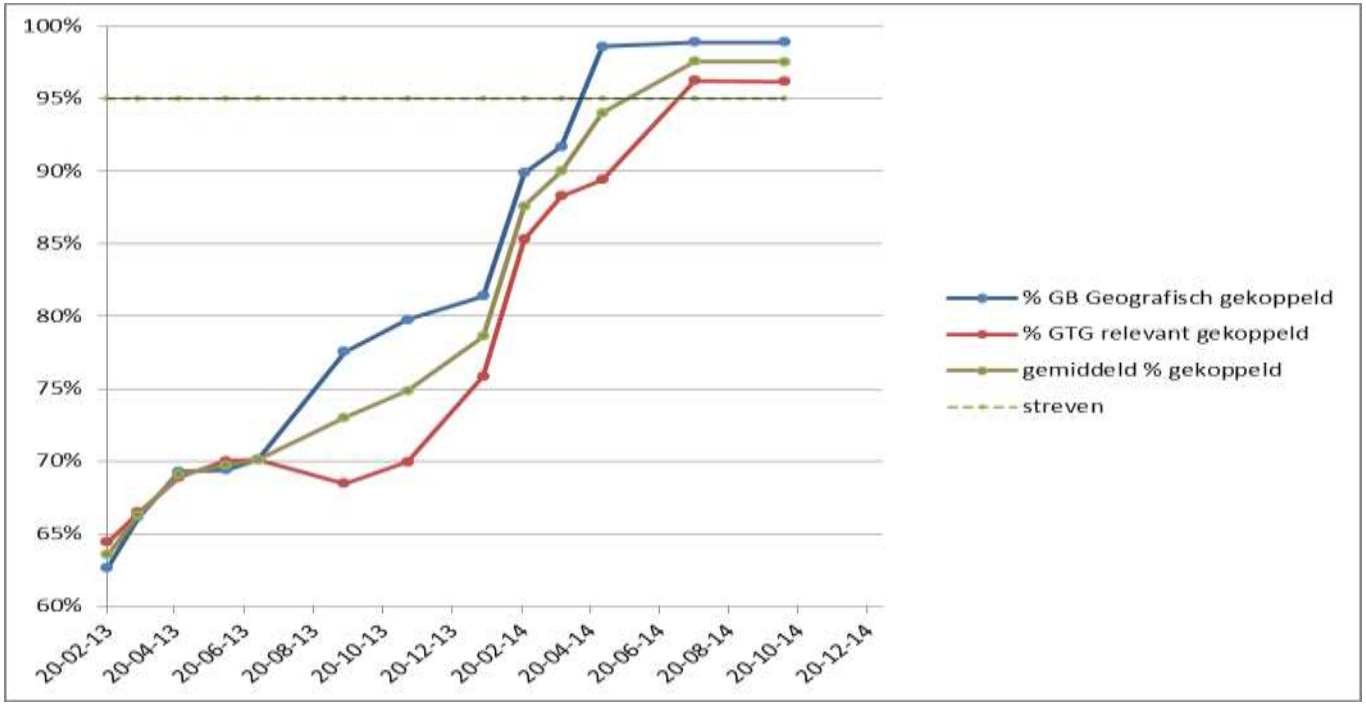
Project information management

2. IMGeo basemap - source of all data



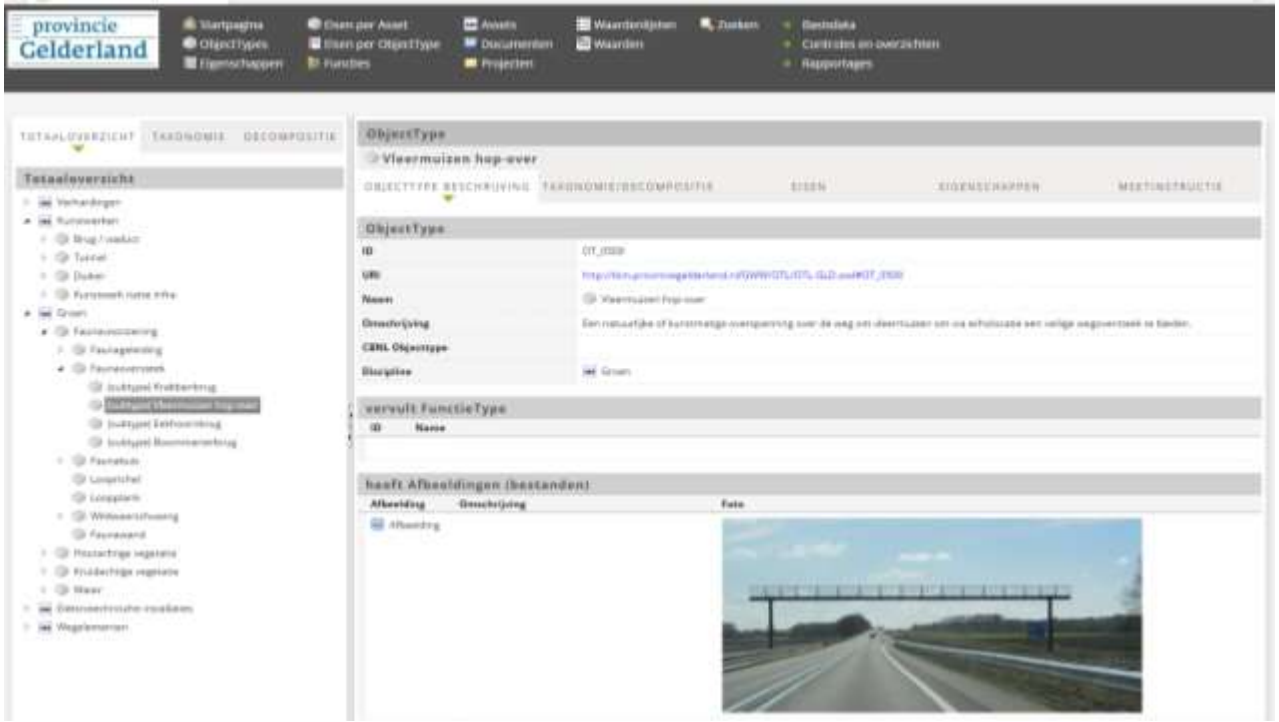
2. IMGeo basemap - source of all data

Monitoring completeness of data in the basemap (2011-2016)



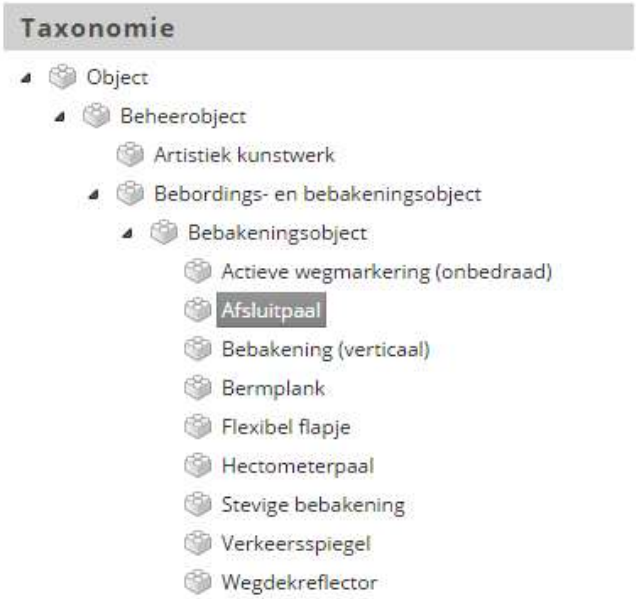
3. Gelderland Object Type Library (OTL)

Dictionary or encyclopaedia of general features of objects (objecttypes)



3. Gelderland Object Type Library (OTL)

- Taxonomy with subtypes till the level used in the integral information system
- Decomposition following (partly) NEN2767-4 standard



3. Gelderland Object Type Library (OTL)

- Instruction how to delimit objects in the IMGEO map
- Schema of properties for in the integral management system

Discipline	ObjectType	ID	Eigenschap	Standaard Waardelijst
Kunstwerken	Kunstwerk	PT_00192	Aantal overspanningen	
Kunstwerken	Kunstwerk	PT_00191	Beweegbaar (J/N)	
Kunstwerken	Kunstwerk	PT_00199	Bouwjaar	
Kunstwerken	Kunstwerk	PT_00518	Bouwmateriaal	KW - Bouwmateriaal

3. Gelderland Object Type Library (OTL)

- Sets of standards requirements that can be used in maintenance projects

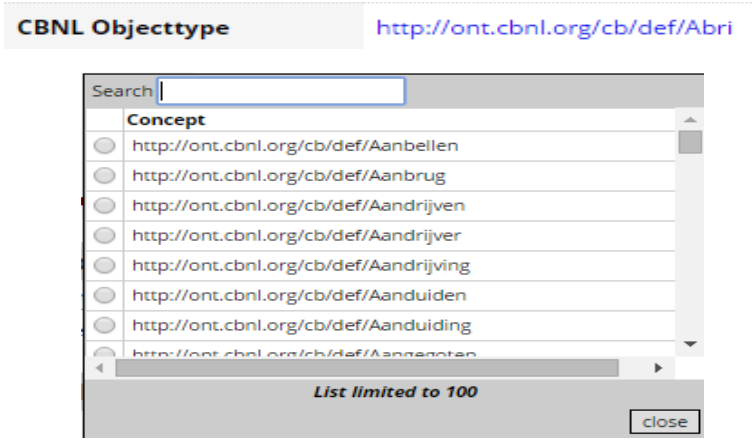
VERHARDINGEN | KUNSTWERKEN | GROEN | ETI | WEGELEMENTEN

Eisen verhardingen

ObjectType	Eis ID	EisTitel	EisTekst	Toelichting	Eissoort_contract	Eissoort_fase	Document	Opmerkingen
Asfaltverharding	RT_00726	Gaten in asfalt	Asfaltverharding dient vrij te zijn van gaten groter dan 100 cm2 met een diepte van meer dan 20 mm.		Proceseis	BON/afkeurcriteria		
	RT_00727	Gelijke bovenkant voegovergangen - wegdek	De bovenkant van de voegovergangen moeten volkomen gelijk te zijn met de bovenkant van aanliggend wegdek		Aspect betrouwbaarheid	Cyclisch onderhoud		
	RT_00728	Lengte van scheuren	Asfaltverharding dient vrij te zijn van scheurvorming met een totale lengte van 10 m1 per 5 m1 wegvak.		Proceseis	BON/afkeurcriteria		
	RT_00730	Reinigen ZOAB	ZOAB verhardingen dienen te zijn gereinigd conform onderstaande voorwaarden: - met een ZOAB cleaner onder 70 tot 170 bar pompdruk; - reinigen 1x per jaar in de maand september of oktober; - jaarlijks de waterdoorlatendheid (2L)ZOAB per 400 m2 meten met een drainometer conform CROW publicatie 161.		Proceseis	Cyclisch onderhoud	CROW publicatie 161: Tweelaags zoab	
	RT_00731	Richtlijn oneffenheden asfalt	Tijdens de technische levensduur dienen oneffenheden onder de richtlijn te blijven als bedoeld in tabel 22, oneffenheden asfalt, Publicatie 146/147 aangepast, wegtype 2, zijnde L3 van CROWrapport 04-13 'Evaluatie Wegbeheer'.		Aspect betrouwbaarheid	BON/afkeurcriteria	CROW rapport 04-13: 'Evaluatie Wegbeheer'	

3. Gelderland Object Type Library (OTL)

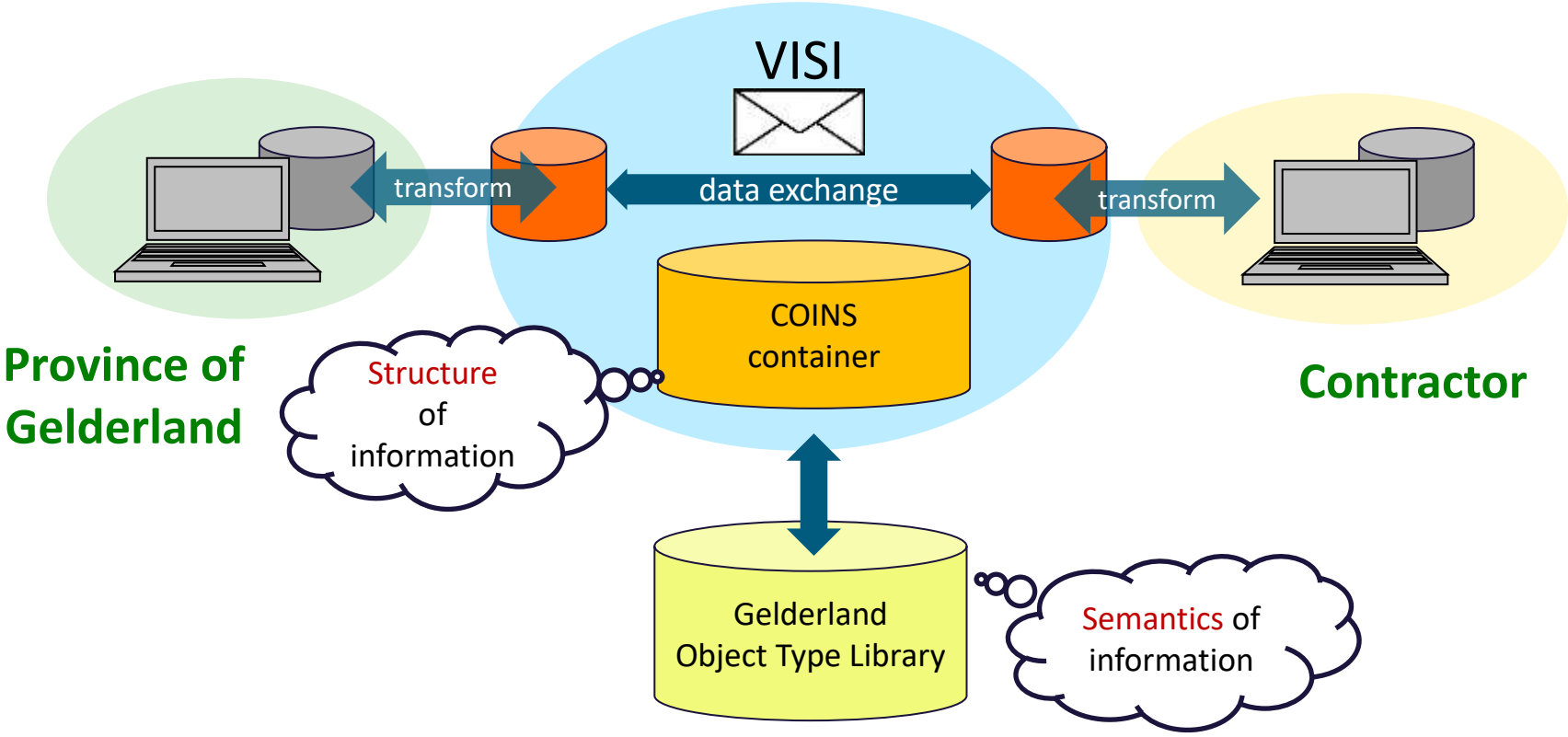
- COINS 1.1 export function (COINS 2.0 is under construction)
- Link with CB-NL library (not yet filled)



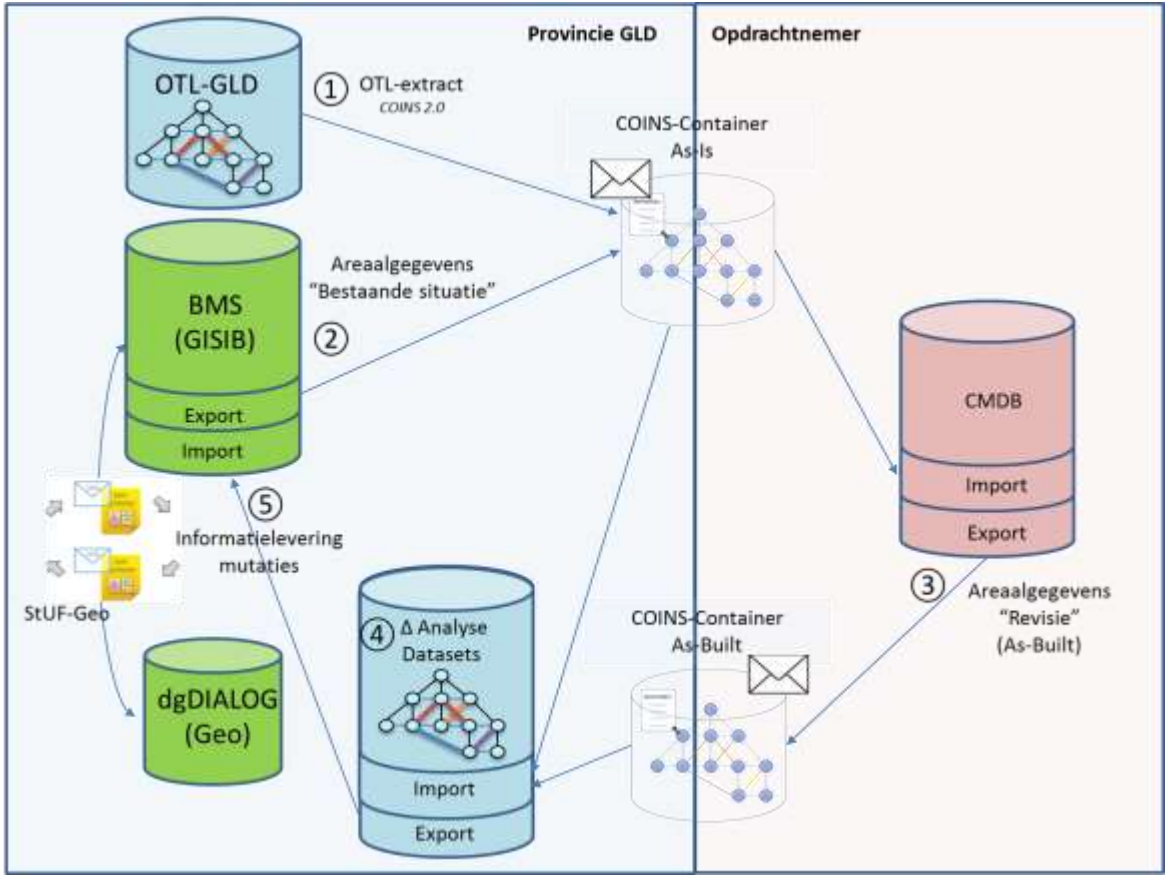
4. Using COINS to keep data complete

- Until 2014 we did all of our data management ourselves
  - Team of surveyors that collected the data after a project was finished
  - Searching through big piles of papers produced by the projects to find the information for the maintenance phase
- But: most of data finds its origin in projects; that is where objects are created, modified or deleted
- The information is there, why don't we use that?
- Using COINS to standardize revision information

4. Using COINS to keep data complete



5. Using COINS 2.0 in maintenance projects



1-2:
Asset information of the integral management system is typed along OTL-GLD and delivered as an ‘as-is’ container

3:
Contractor modifies data and sends ‘as-built’ container back

4:
(Geo)SparQL queries are used for delta-analysis

5:
Mutations are read back into integral management system using IMGEO messages coded with the ‘GeoSTUF’ standard.

Synchronisation between management system and system for large scale topography uses the same messages

Questions