



**Developing a vario-scale IMGeo using the constrained tGAP structure**

Arjen Hofman



March 4<sup>th</sup> 2008




**Presentation outline**

- Assignment introduction
- Testdata
- Pre-processing
- Results
- Conclusions

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**Parties involved**

- Gemeentewerken Rotterdam
- Delft, University of Technology
- Municipality of Almere
- Kadaster

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**Research question**

- *How can a vario-scale IMGeo be designed and developed by applying the constrained tGAP structure with Top10NL as initial constraint?*

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## Datasets

- NEN3610: Basic model for geography
- Two important derivatives:
  - IMGeo
  - Top10NL

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## IMGeo

- Large scale topographical model
  - 1:1,000
  - Object oriented
  - Derived from GBKN
  - Recently affirmed by GI Beraad
  - Pilot in Almere

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## IMGeo

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## Top10NL

- Medium Scale Map
  - 1:10,000
  - Produced by the Dutch Cadastre
  - Successor of Top10Vector
  - Authentic registration on topography



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## Top10NL





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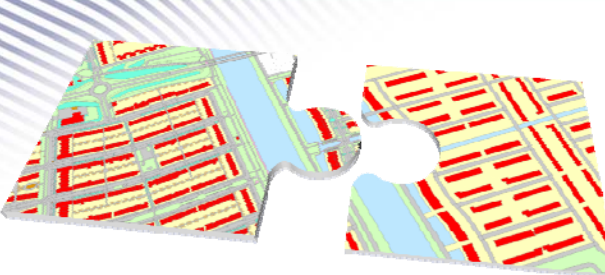
## Generalisation method

- Constrained tGAP
- Merging objects in 1:1,000 map until the situation in the 1:10,000 map is reached
- IMGeo objects are placed in a Top10NL region



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## How to combine the two datasets?





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## Differences IMGeo – Top10NL

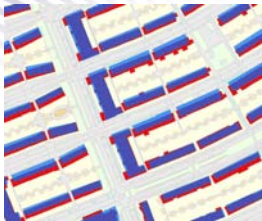
- General
  - Small differences in the modelling
  - Models have a different background
  - No tuning when making the models
- Testdata
  - Buildings
  - Roads
  - Semantics

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## Geometry



Buildings




Roads




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## Semantics





IMGeo: plants



Top10NL: wood?

Hierarchy?



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## Data pre-processing

- How to assign an IMGeo object to a Top10NL region?
  - Intersect and split all IMGeo objects in case of a Top10NL border
  - Assign the IMGeo object to the Top10NL object that overlaps the IMGeo object most
  - Split the IMGeo object in case of a 50-50 situation



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## IMGeo normal




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## Top10NL normal




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## Simple intersection



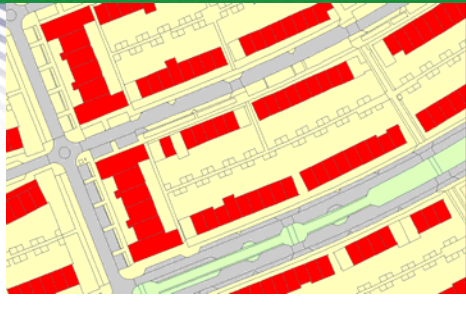
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## IMGeo with 'maximum area method'




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## IMGeo with 'split method'



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## Solution: first classify buildings



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## Results using the constrained tGAP



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## New weights

Class	Code	Weight
Residence object / Building	1001	13
Other Building	5003	1
Road	2001	1,2
Water	3001	1,3
Lot	4001	9
Fallow land	4002	1
Plants	4003	0,9
Terrain (to be determined)	4004	0,1
Grass / Grassland	4005	1
Bin	5001	0,1

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## Result using new weights



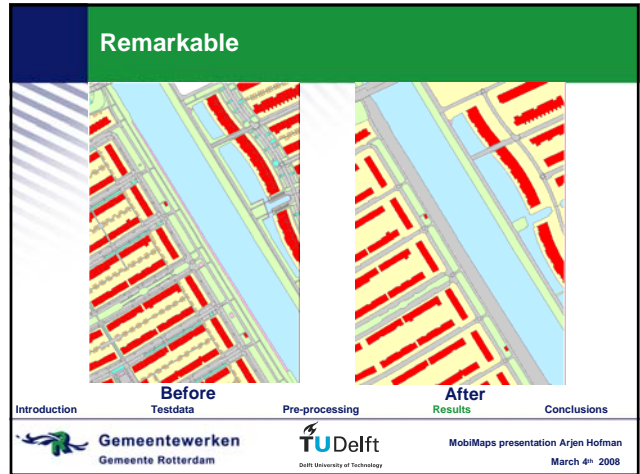
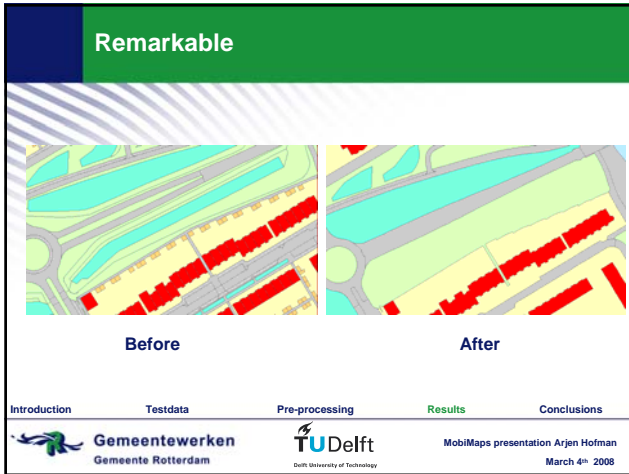
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- ## Conclusions
- Constrained tGAP is a good addition to the tGAP structure
  - No short term implementation of tGAP at municipal level foreseen
  - 'Building first' method as constrained tGAP classification method works best
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- ## Recommendations
- Municipalities:**
- Cut road objects into better pieces
  - Cooperate with Kadaster when updating IMGeo
- Kadaster:**
- Make Top10NL an area partition
  - Cooperate with IMGeo study group
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## Future research

- Add line simplification to the constrained tGAP algorithm
- Look at 3D (constrained) tGAP

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## Questions?

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