

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

---

Arjen Hofman, Arta Dilo, Peter van Oosterom, Nicole Borkens

21-06-2008, Montpellier

ICA International Workshop on Generalisation

## Introduction

- MSc thesis within municipality of Rotterdam
- Problem definition:
  - Efficiency
  - Data authenticity
- Solution:
  - Integration through tGAP

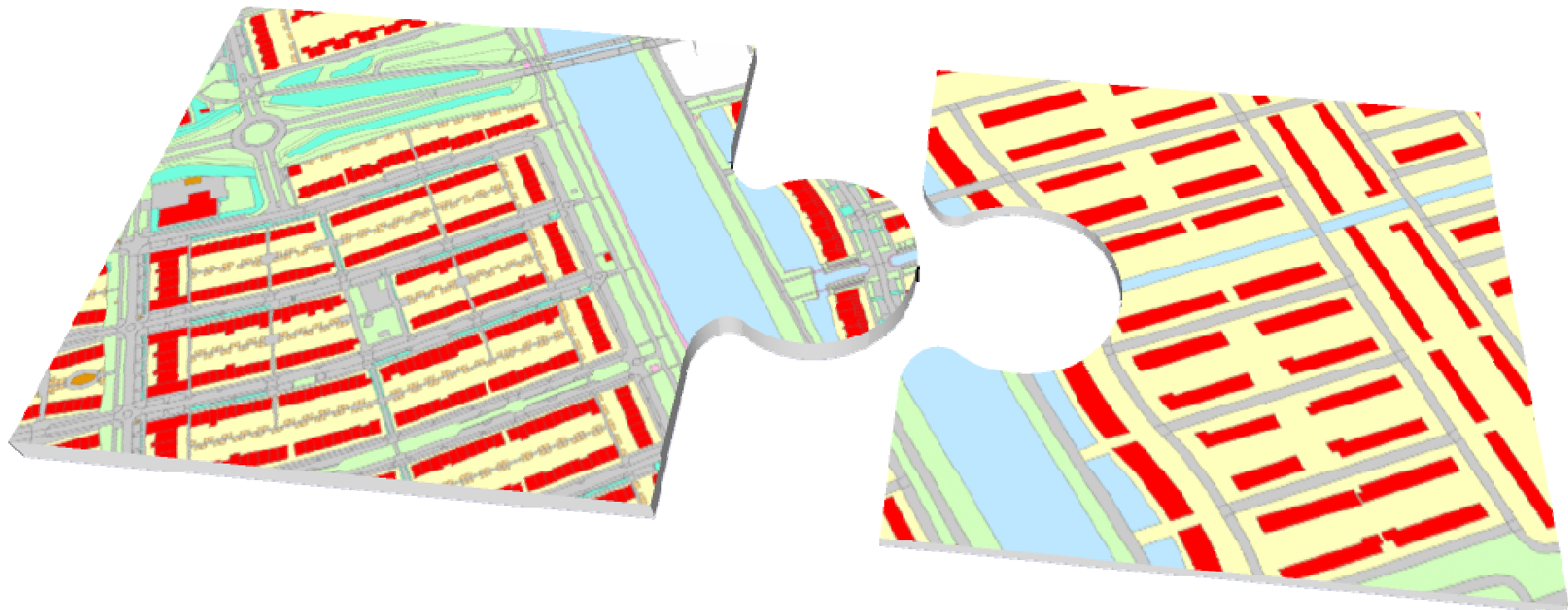
## Generalisation method

- tGAP = topological Generalised Area Partition
  - Merging area objects, storing in a tree structure
- Constrained tGAP structure
  - Merging large scale objects until the small scale situation is reached
  - Weights and compatibilities guide the generalization proces
  - Use of constraint improves results tGAP
  - Instead of optimization a real dataset is used as constraint

## Datasets

- IMGeo
  - Large scale object oriented exchange model
  - 1:1,000
  - Derived from line-based GBKN
  - Pilot in Almere
- Top10NL
  - Medium Scale Map
  - 1:10,000
  - Successor of Top10Vector
  - Authentic registration on topography

# How to combine the two datasets?



Introduction

Generalisation

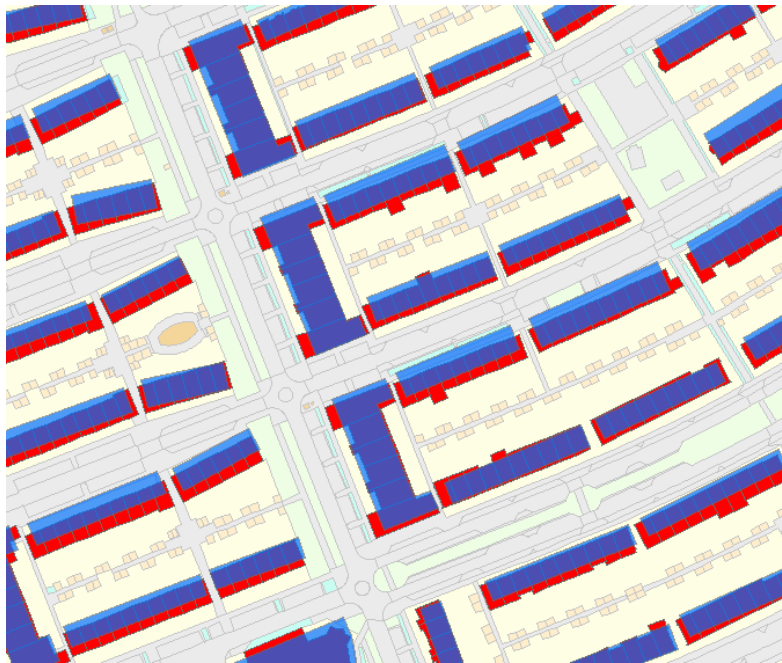
Pre-processing

Results

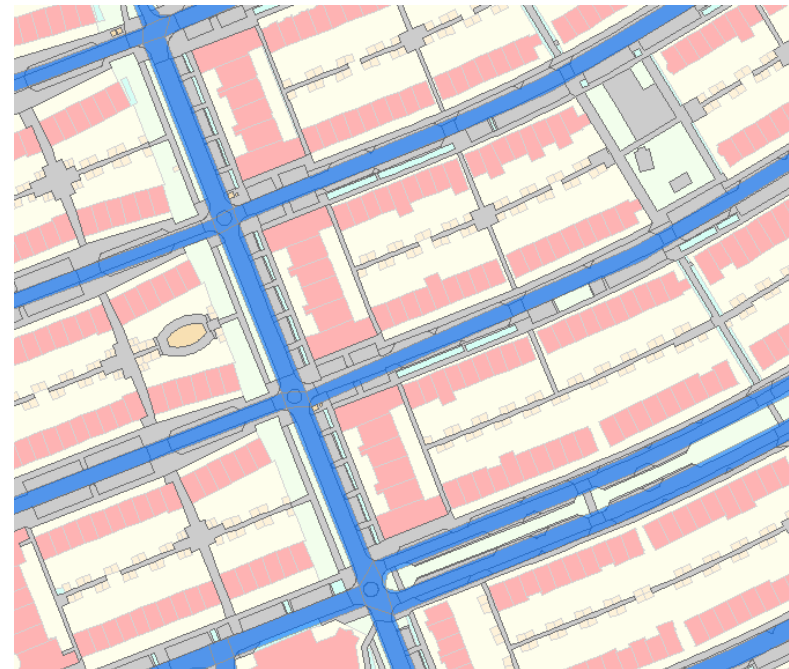
Conclusions

# Geometrical differences

Buildings

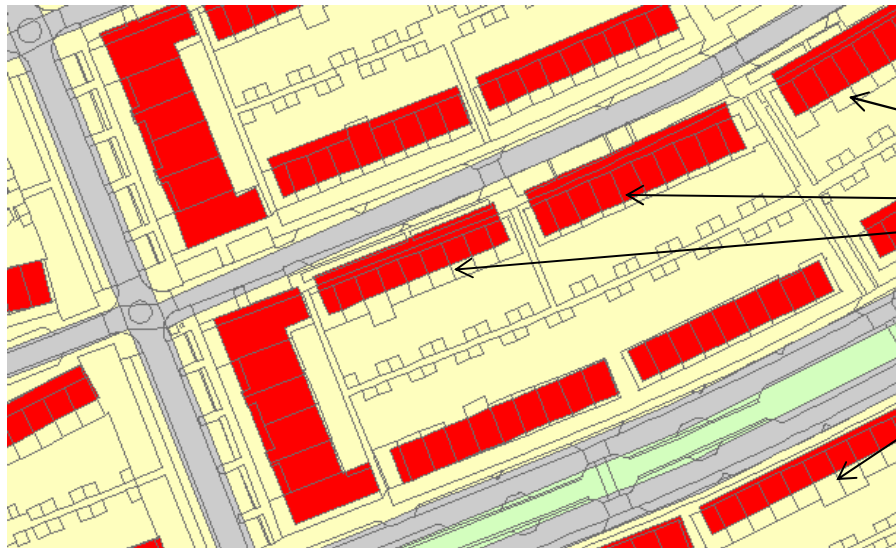


Roads



## Methodology of 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
  - Classify buildings first

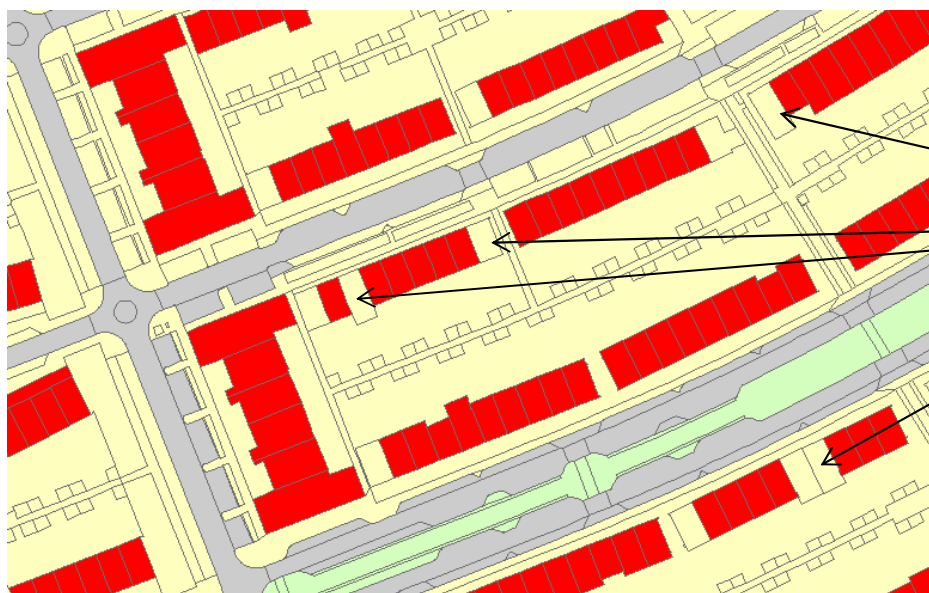


+ End result resembles Top10NL

- IMGeo geometry not leading.

## Methodology of 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
  - Classify buildings first



+ IMGeo geometry  
is leading

- Not satisfying  
end result

Introduction

Generalisation

Pre-processing

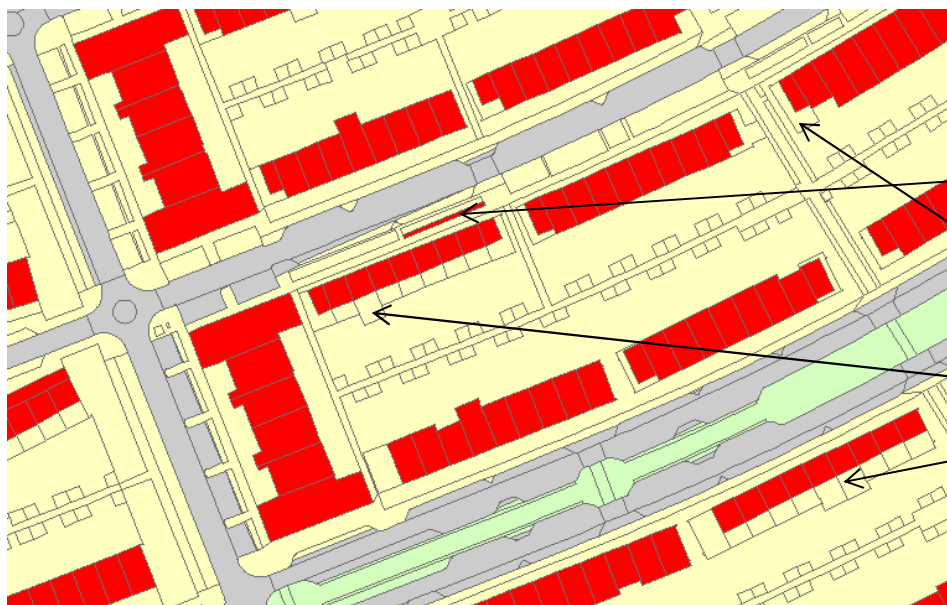
Results

Conclusions



## Methodology of 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
  - Classify buildings first



- Parking place  
classified as  
building

- Not satisfying  
end result

Introduction

Generalisation

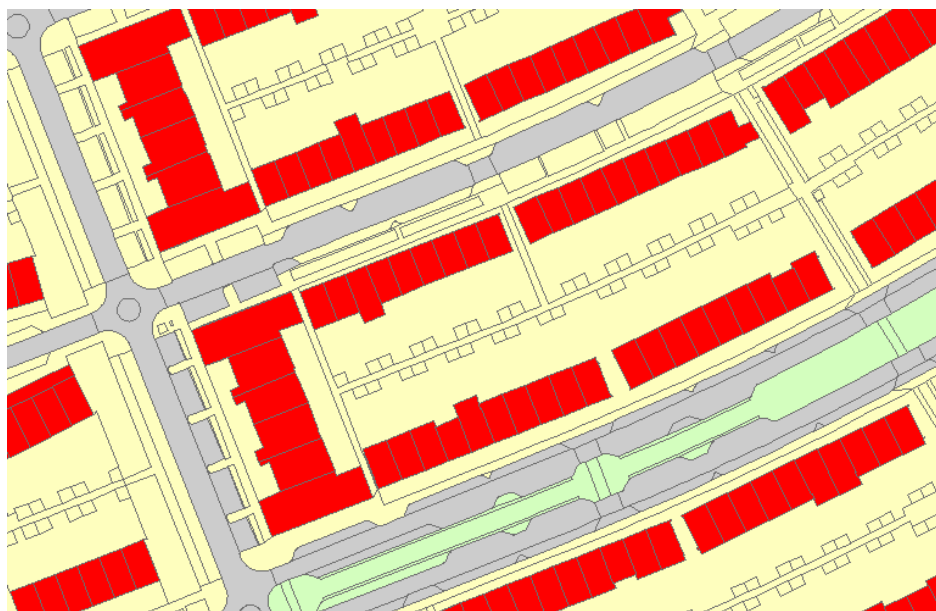
Pre-processing

Results

Conclusions

## Methodology of 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
  - **Classify buildings first**



+ IMGeo geometry  
is leading

+ Good representation  
in end result

Introduction

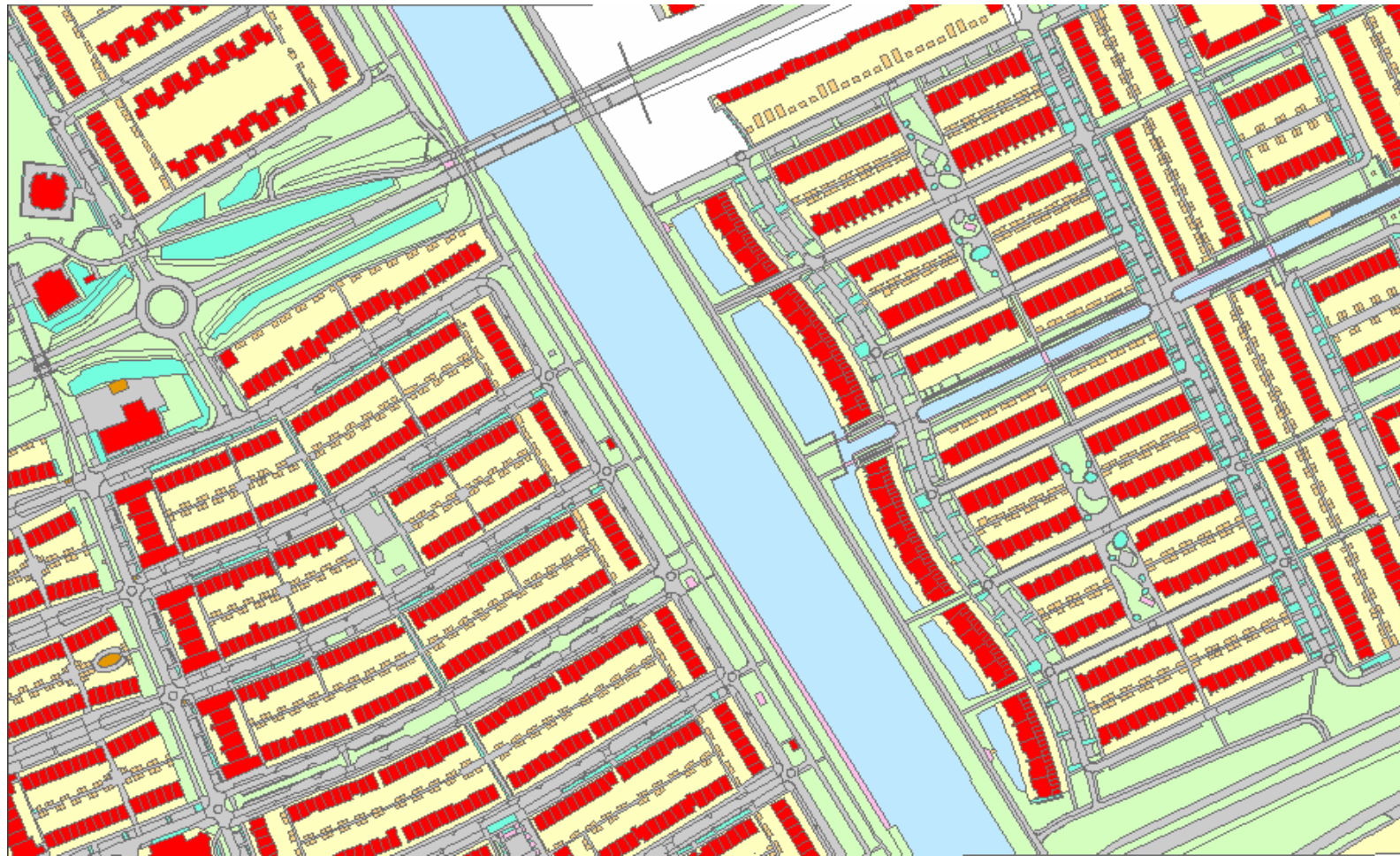
Generalisation

Pre-processing

Results

Conclusions

# Results using the constrained tGAP structure (Almere)



Introduction

Generalisation

Pre-processing

Results

Conclusions



## Results using the constrained tGAP structure (Almere)



Introduction

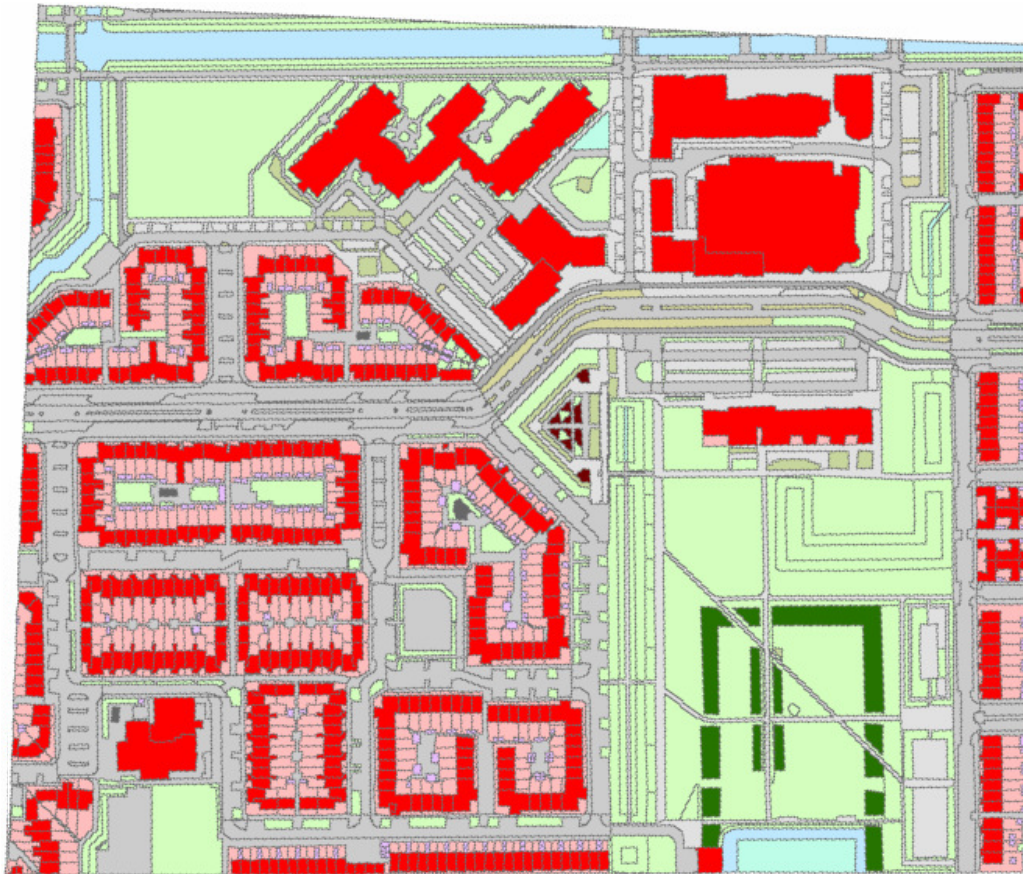
Generalisation

Pre-processing

Results

Conclusions

## Results using the constrained tGAP structure (Rotterdam)



Introduction

Generalisation

Pre-processing

Results

Conclusions

## Conclusions and recommendations

- The constrained tGAP with a real dataset as constraint can be an improvement to the version with the optimization.
- Building first method is suitable as classification method for constrained tGAP.
- To improve the results line simplification needs to be added to the (constrained) tGAP algorithm.