ICA Workshop on
Generalisation and
Multiple Representation

# Generalising OS MasterMap® Rural Buildings to 1:50 000

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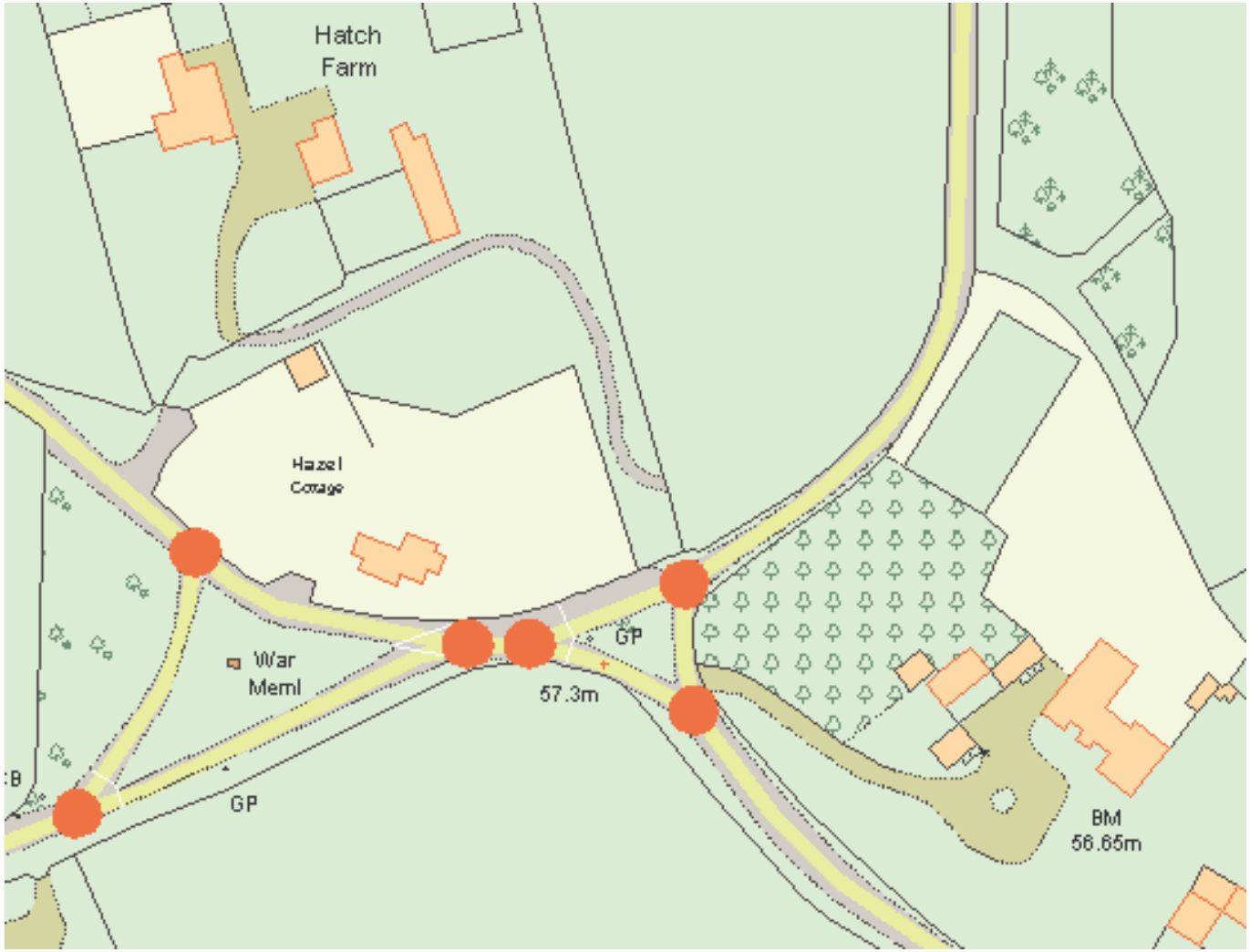
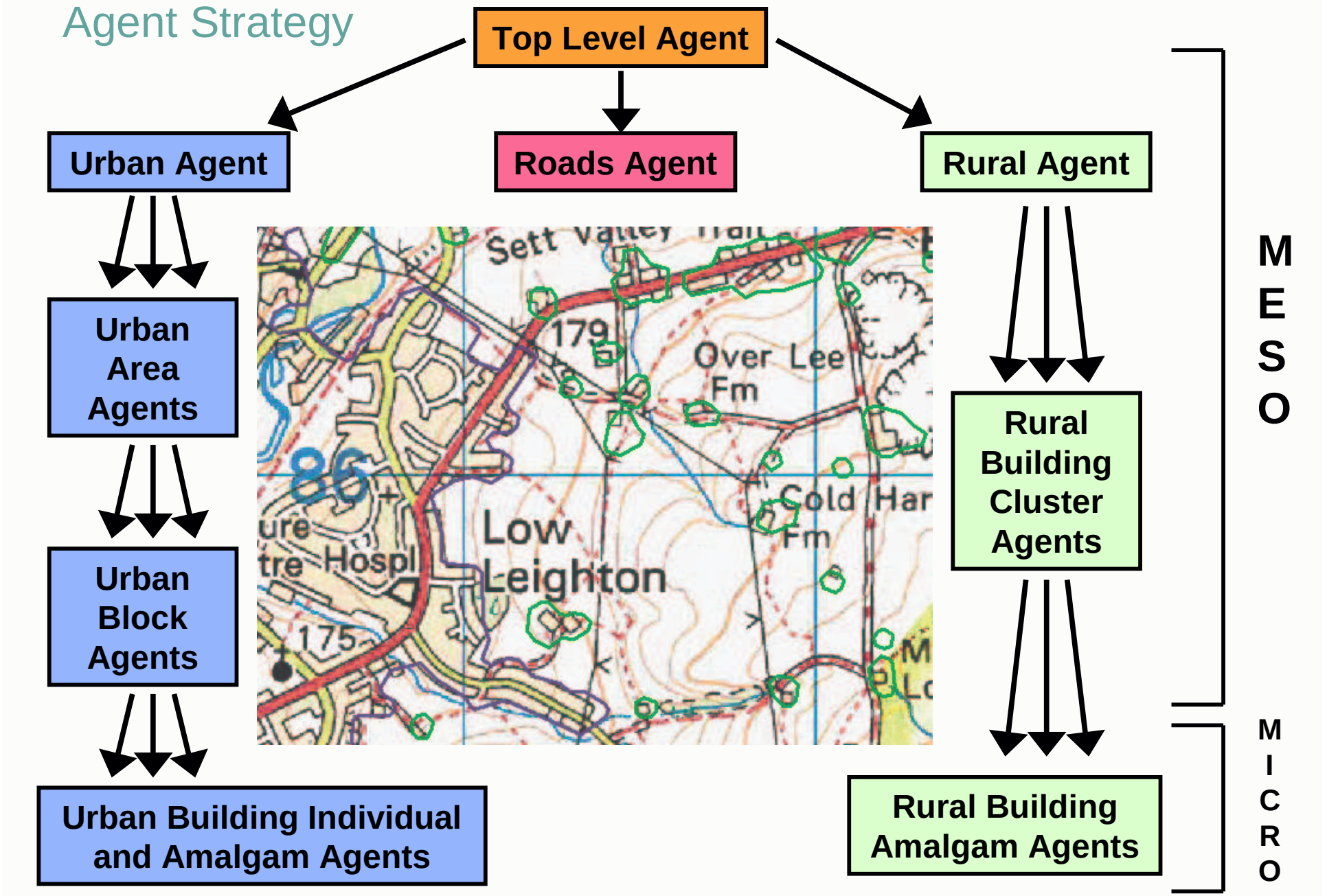
# The Challenge

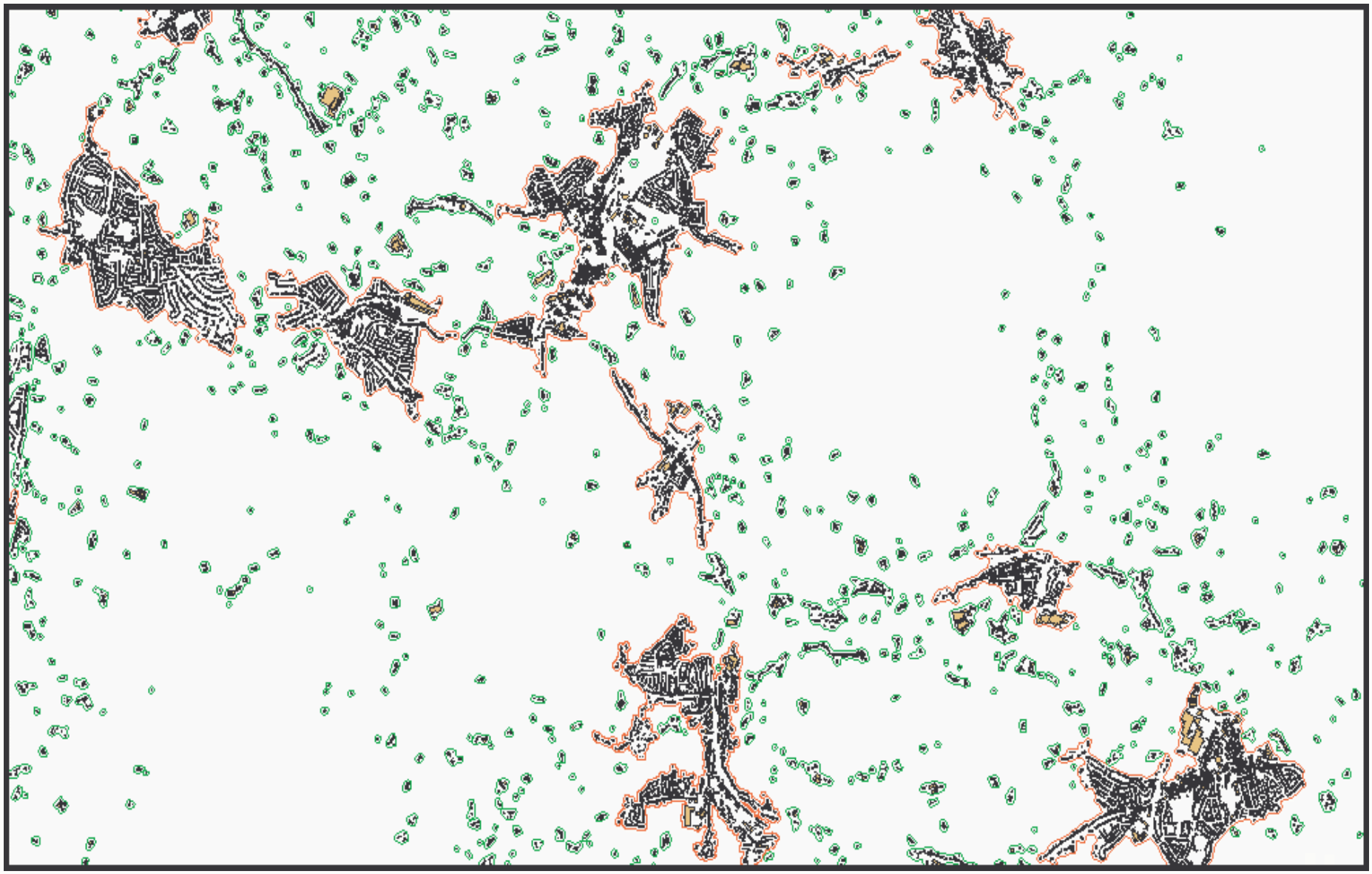
Develop a prototype to generate 1:50K DCM automatically from OS MasterMap® topographic and ITN data.




# Agent Strategy



# Urban Areas and Rural Clusters



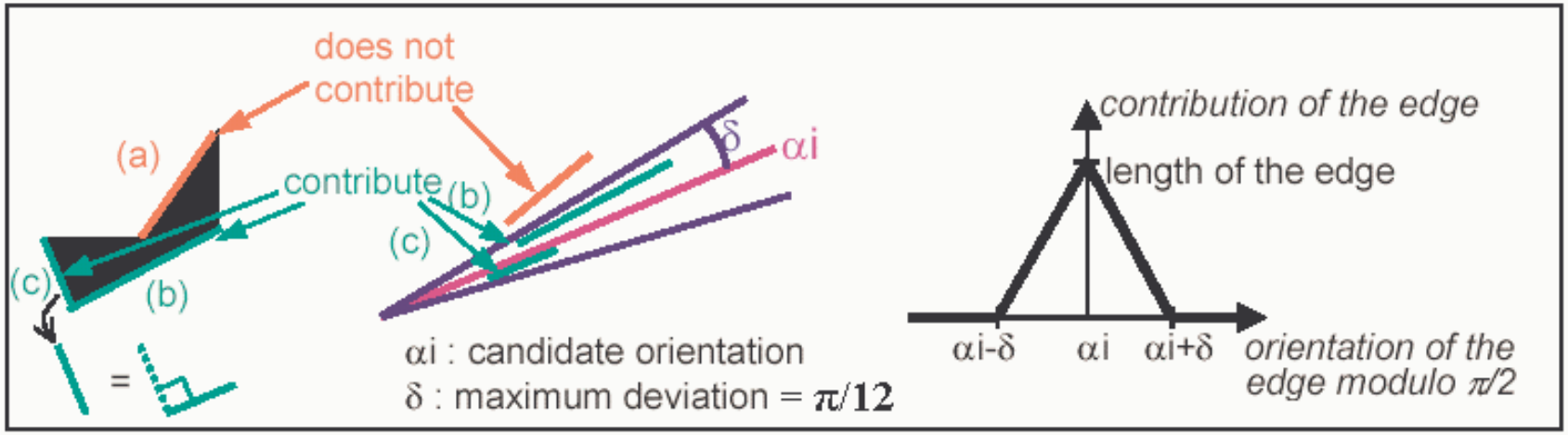
## OS MasterMap topography and ITN - source

## Existing 1:50 000 scale raster – target style

# Selection of Amalgamation Candidates

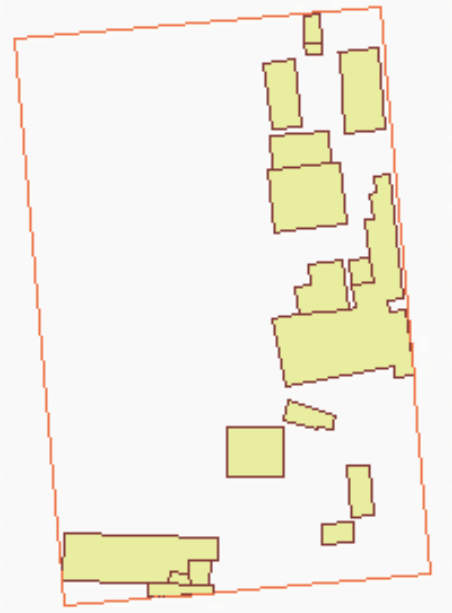
- Group buildings by proximity.
- Split proximity groups by separating features.
- Current selection is not ideal (eg. buildings around the outside of a road bend need splitting)
- Plans to use agent approach to try out several groupings, perform the generalisation then choose the best result.

# The Orientation of a Building Group




**Contribution of an edge of the building to a candidate orientation αi, modulo π/2**

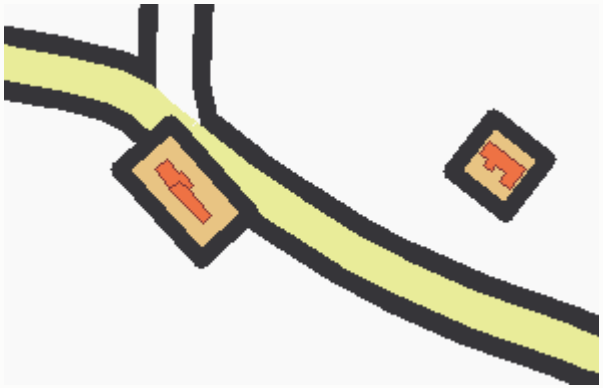
**Picture courtesy IGN France**

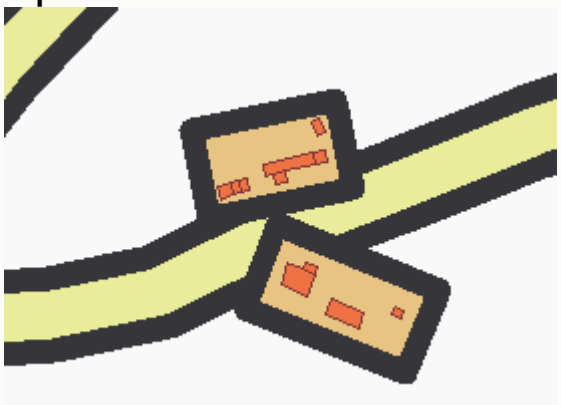


- 90 candidate orientations between 0 and π/2.
- Evaluate contribution of each building edge in group to each candidate orientation.
- Longest edges have greatest contribution.
- Take care near 0 and π/2 since these are “equal” mod π/2.
- Group orientation is the candidate with largest total contribution.

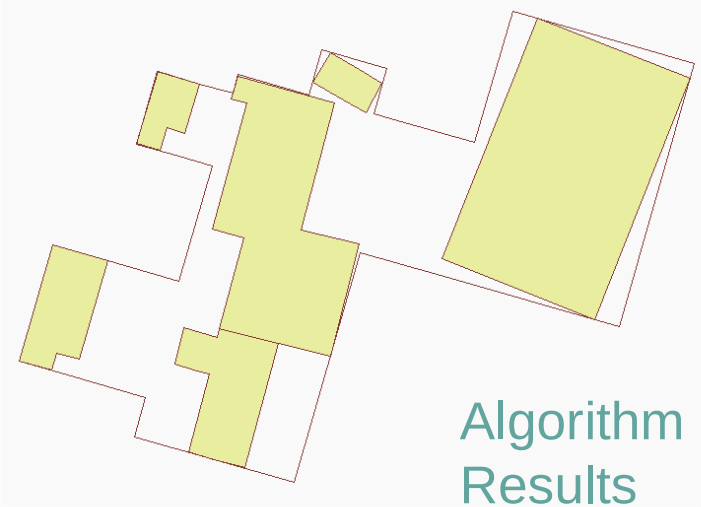
# Group Oriented Bounding Rectangles (GOBR)

- Delete building amalgam if area GOBR < deletion threshold.
- If both sides of GOBR < min side length, enlarge amalgam to min size length square.
- If one side of GOBR < min side length, enlarge both sides by same amount until shortest side complies.

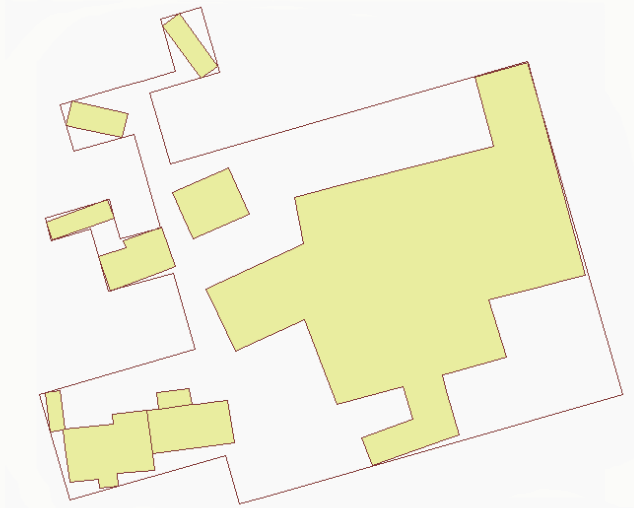


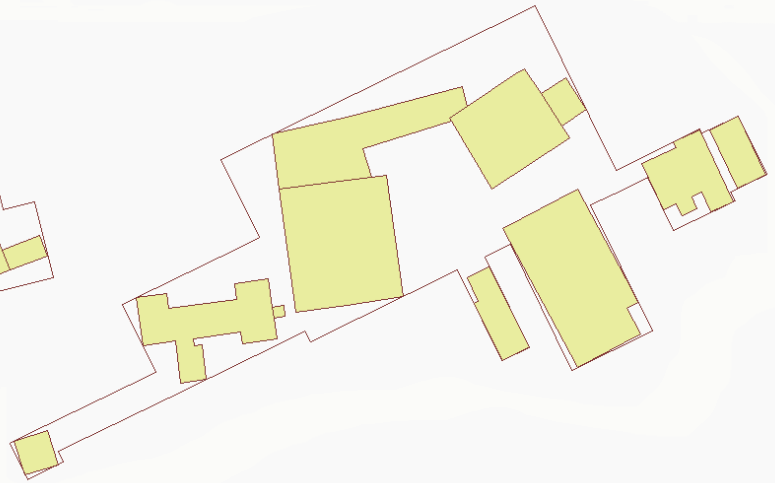


# Initial Squared Amalgam



Algorithm Results





Existing 1:50 000 Examples:

# Simplified Squared Amalgam

- Identify amalgam concave corners.
- Apply a rectangular patch to the smallest concave corner.
- Continue process until all concave corner edges are above threshold.
- Result needs a local enlargement algorithm to ensure all edges are above threshold.

# Final Positioning of Building Amalgams: Displacement + Geometry Adaptation

**Road Proximity** – buildings adapt their boundaries to the roads.

**Forest/Water Proximity** – adjacent features adapt their boundaries to the buildings.

**Inter-Building Proximity** – buildings stand alone or touch corner to corner.