Road Network Selection Using an Extended Stroke-Mesh Combination Algorithm

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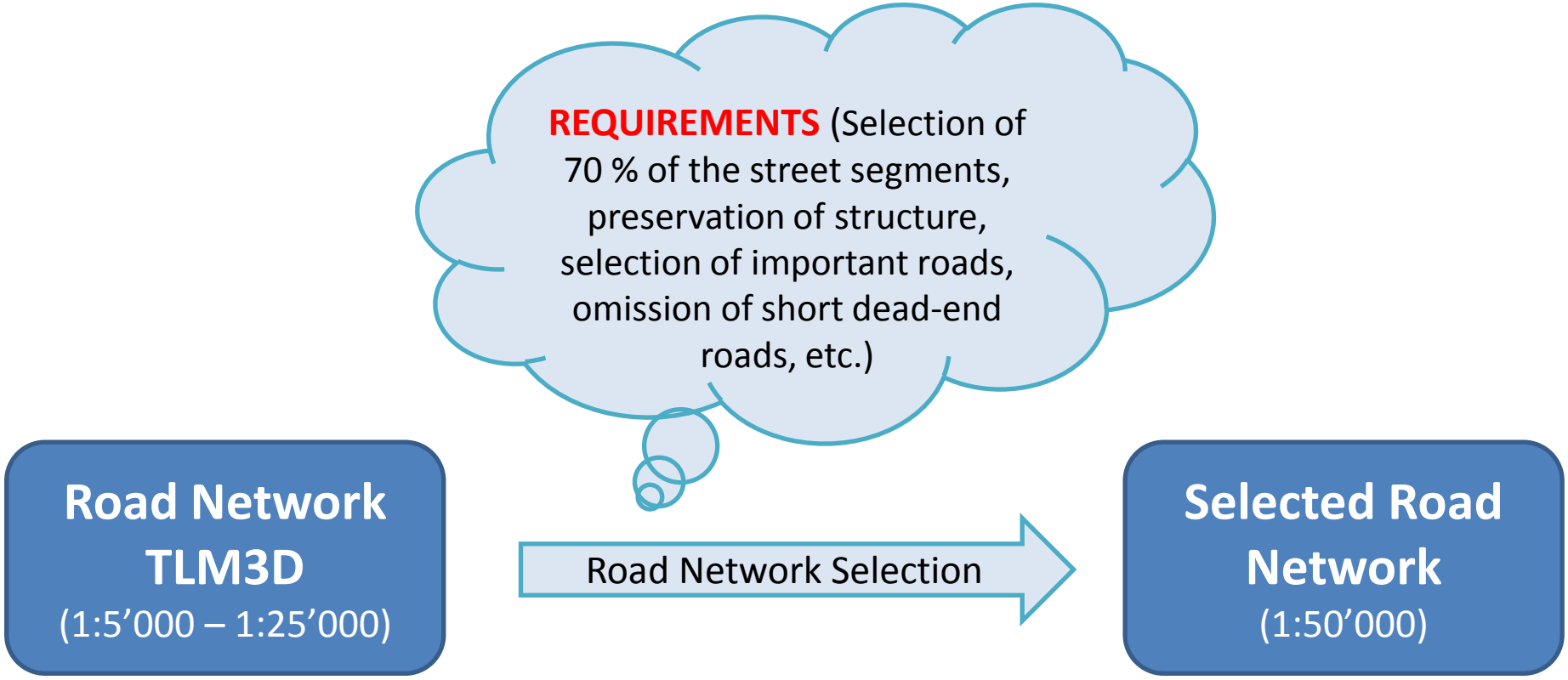
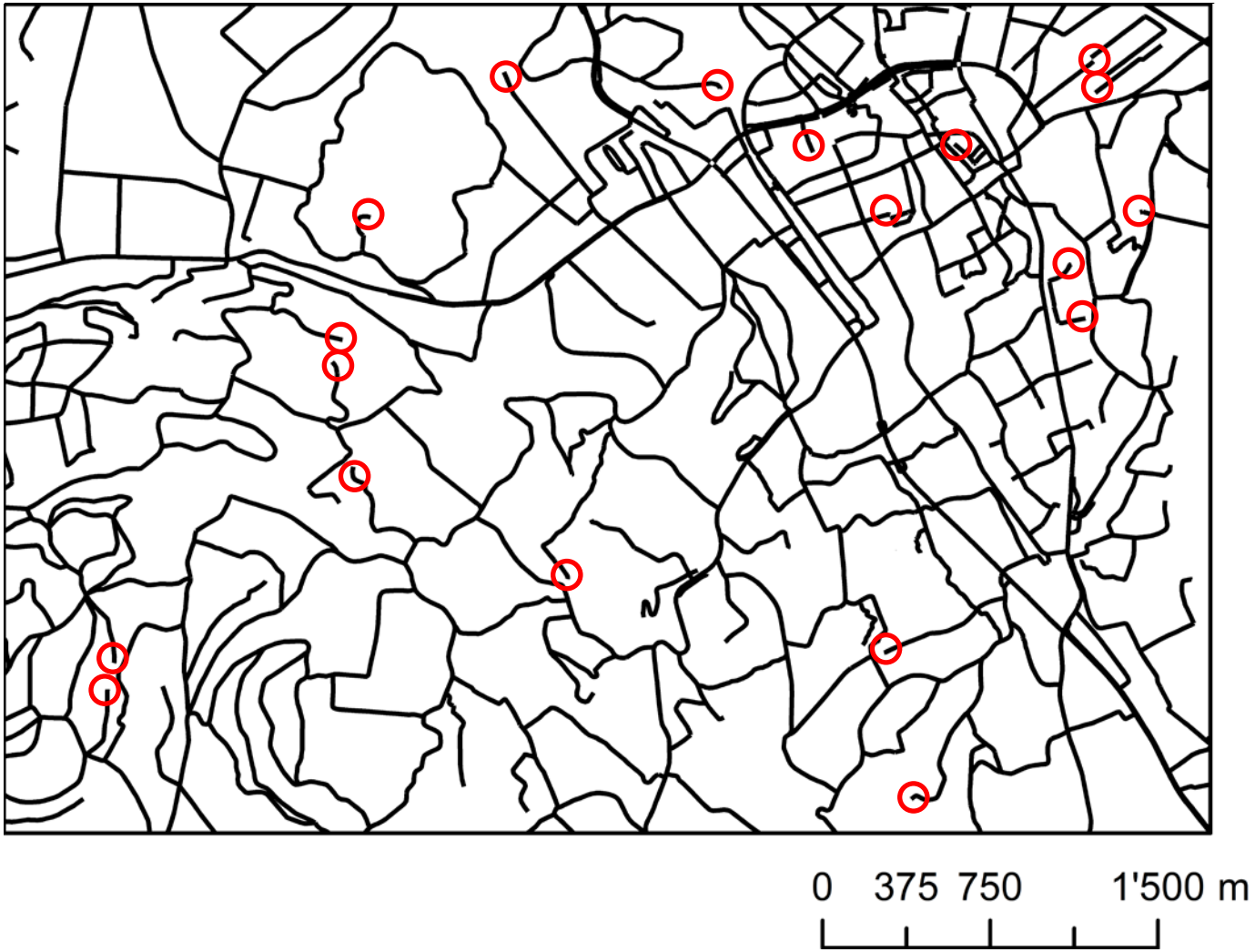
Research project in collaboration with swisstopo

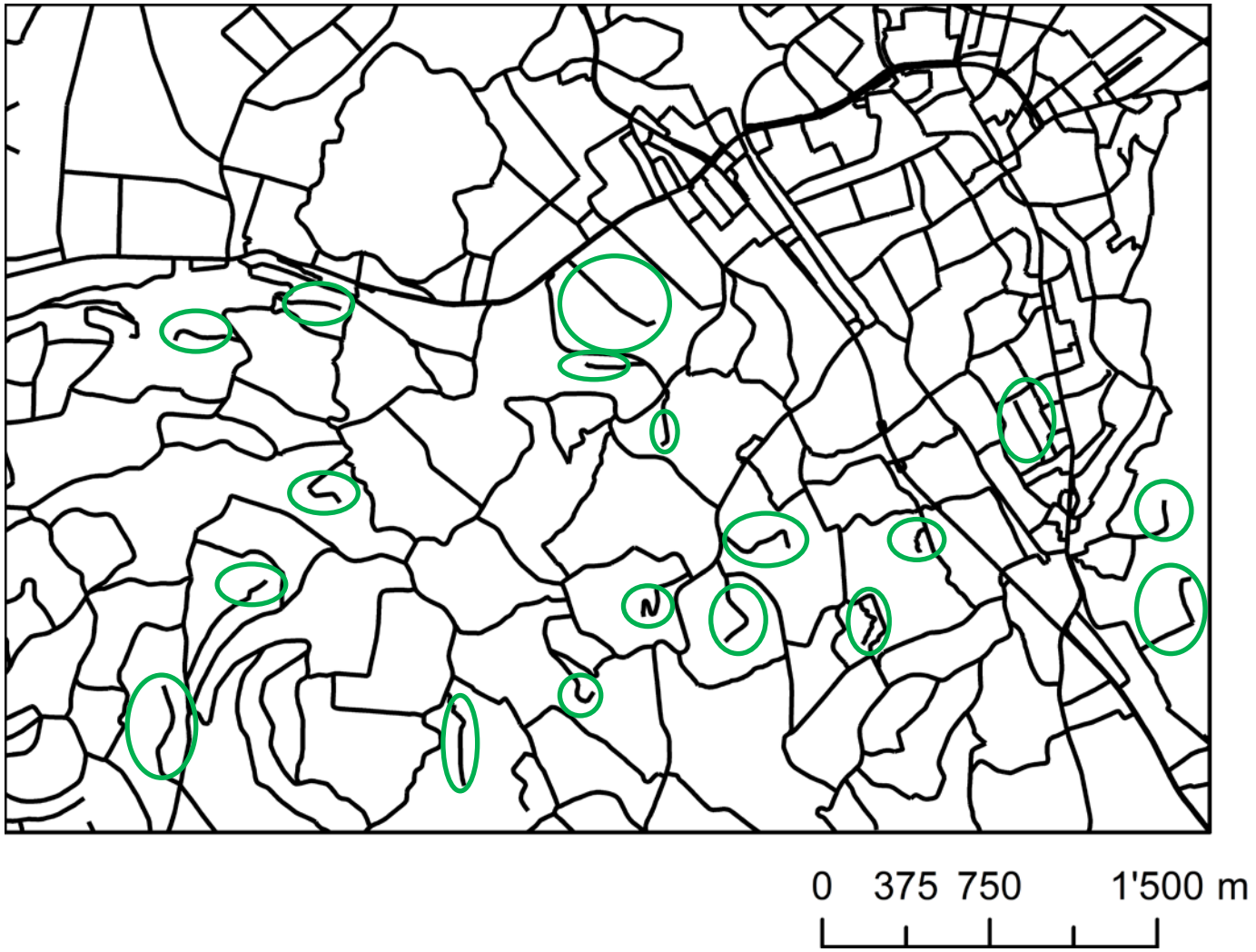


Stroke algorithm (Thomson and Richardson 1999)

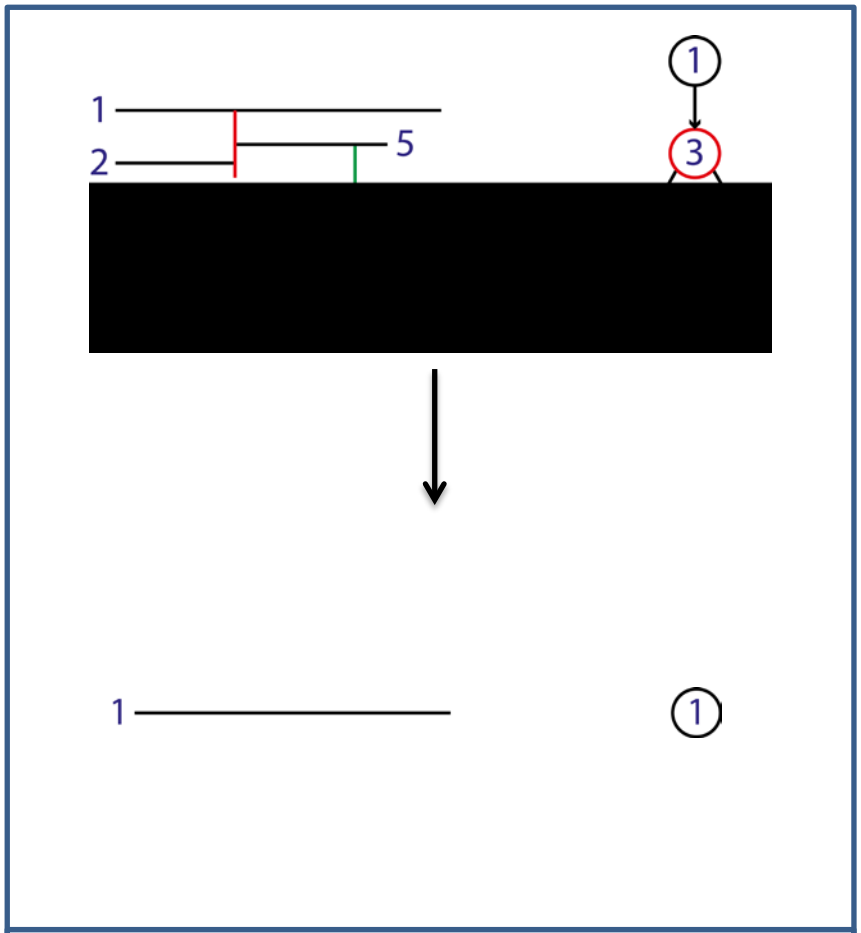


Mesh algorithm (Chen et al. 2009)

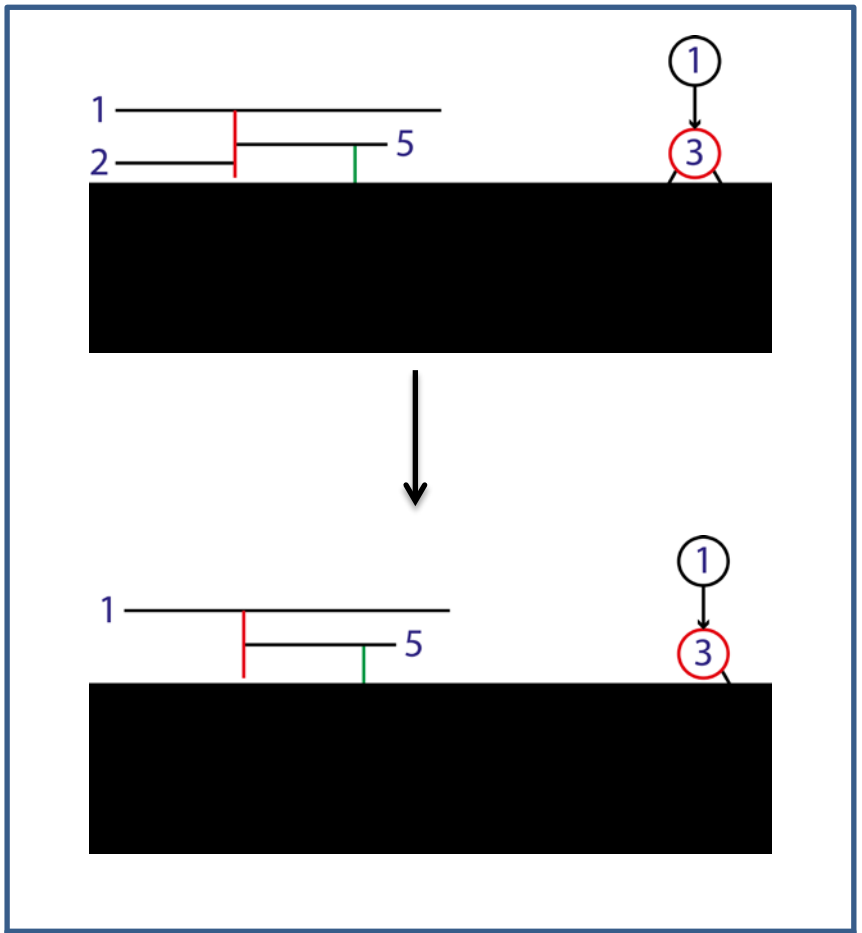
Stroke-Mesh combination algorithm (Li and Zhou 2012)



1: Bottom-Up approach

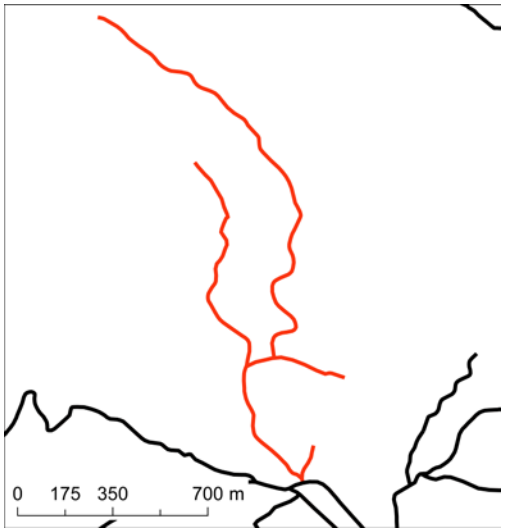


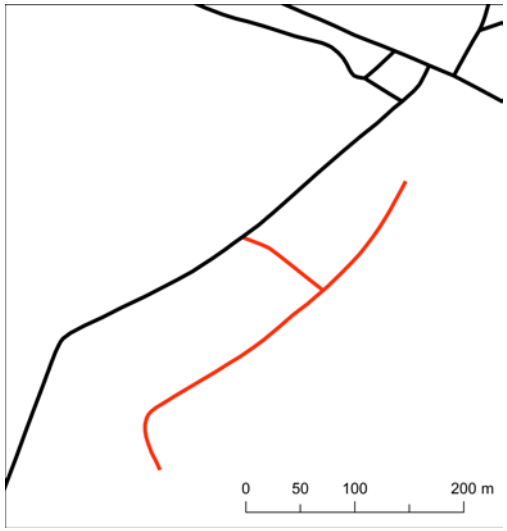
Top-Down (Li and Zhou 2012)



Bottom-Up (our solution)

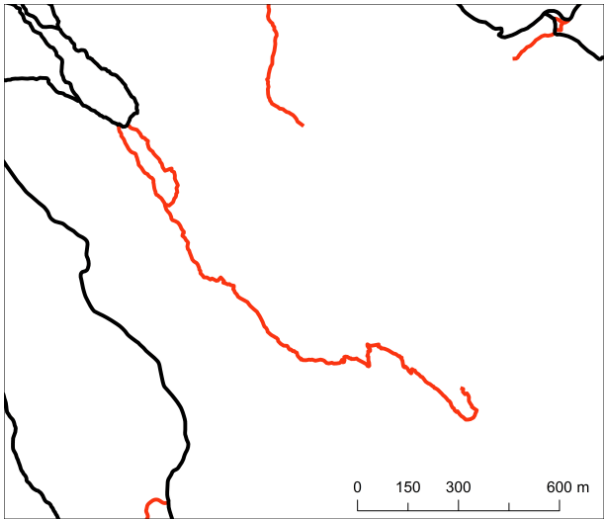
1: Bottom-Up approach



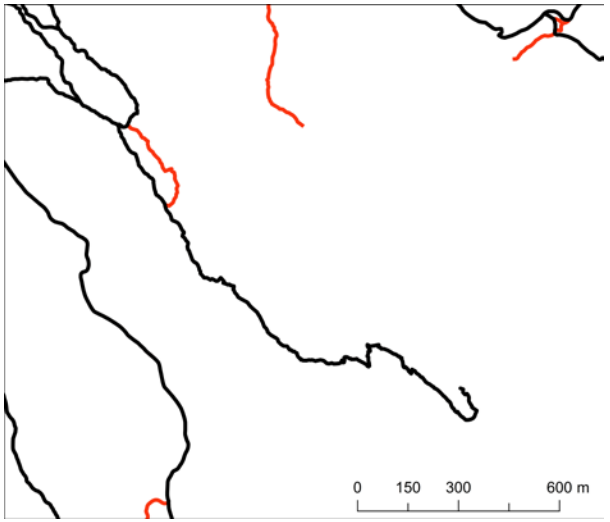


Segments ommited using the top-down approach, but selected using the bottom approach

2: Unconnected linear patterns

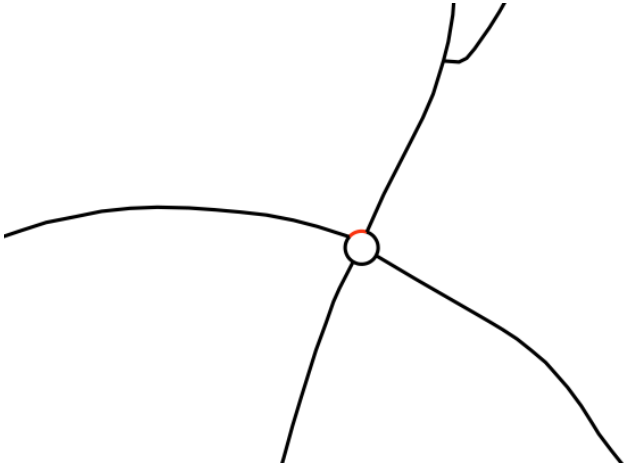


Shortest path

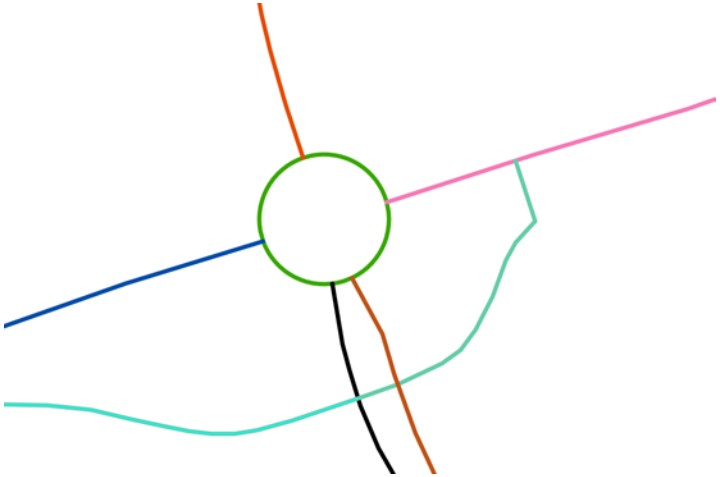


Ommited segments

3: Roundabout correction



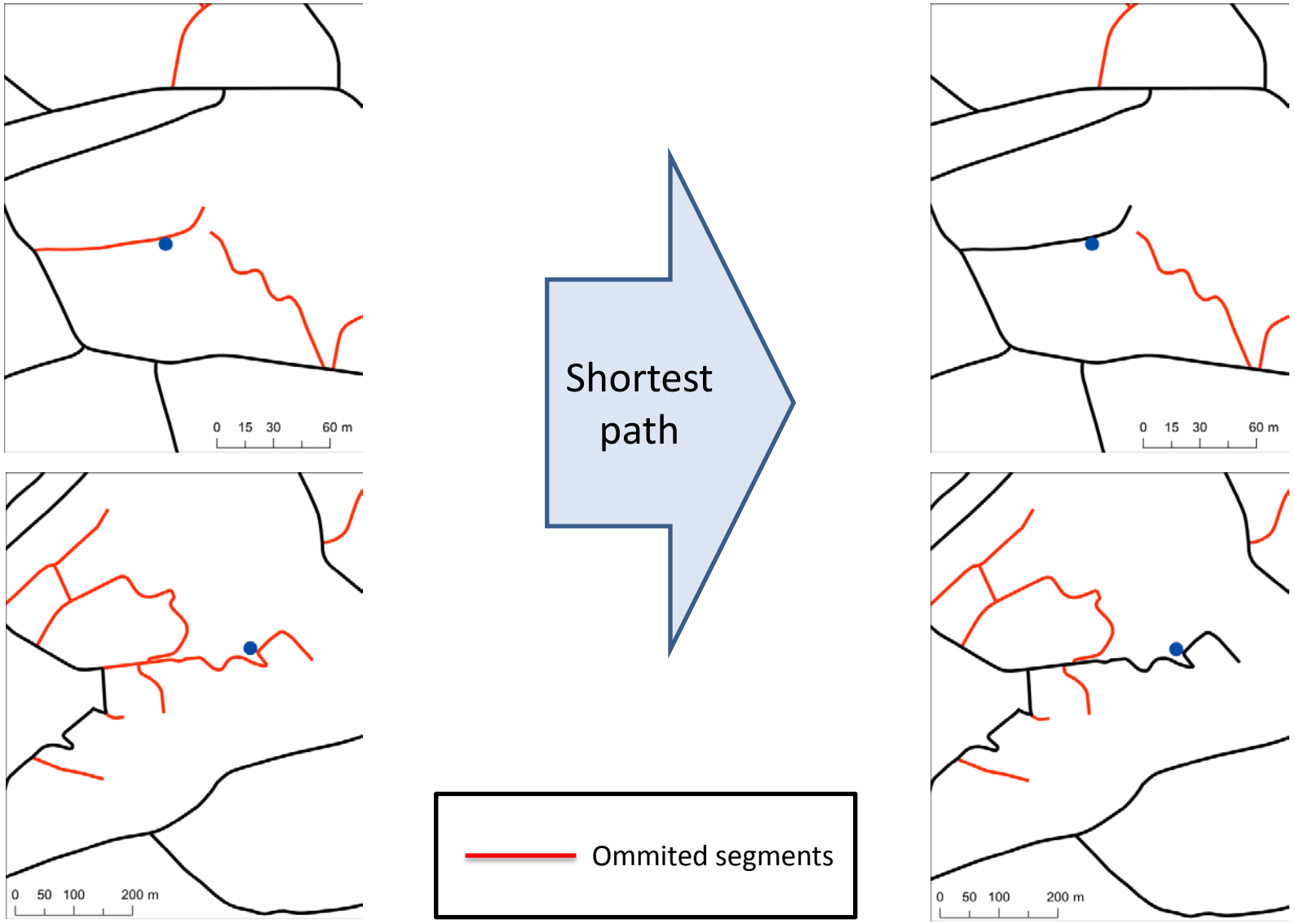
Roundabout extraction



Swisstopo map (1:50’000)

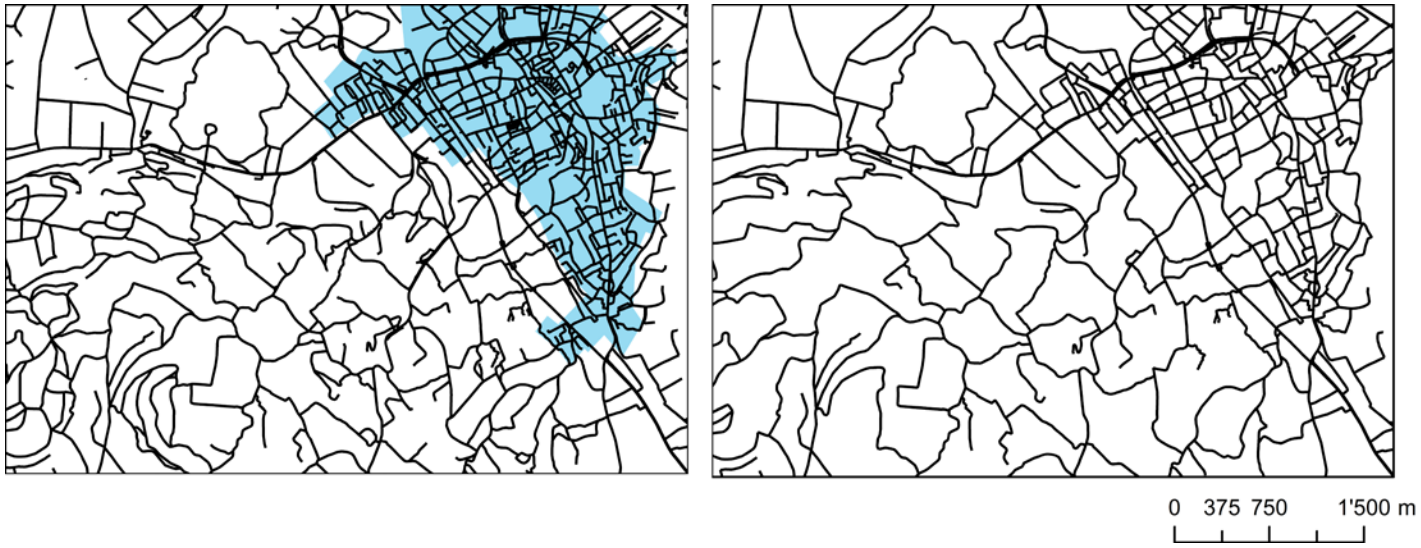
1. Build Strokes
2. Extract circular strokes using a length threshold (e.g. 90 m)
3. Select the whole roundabout

4: POI accessibility



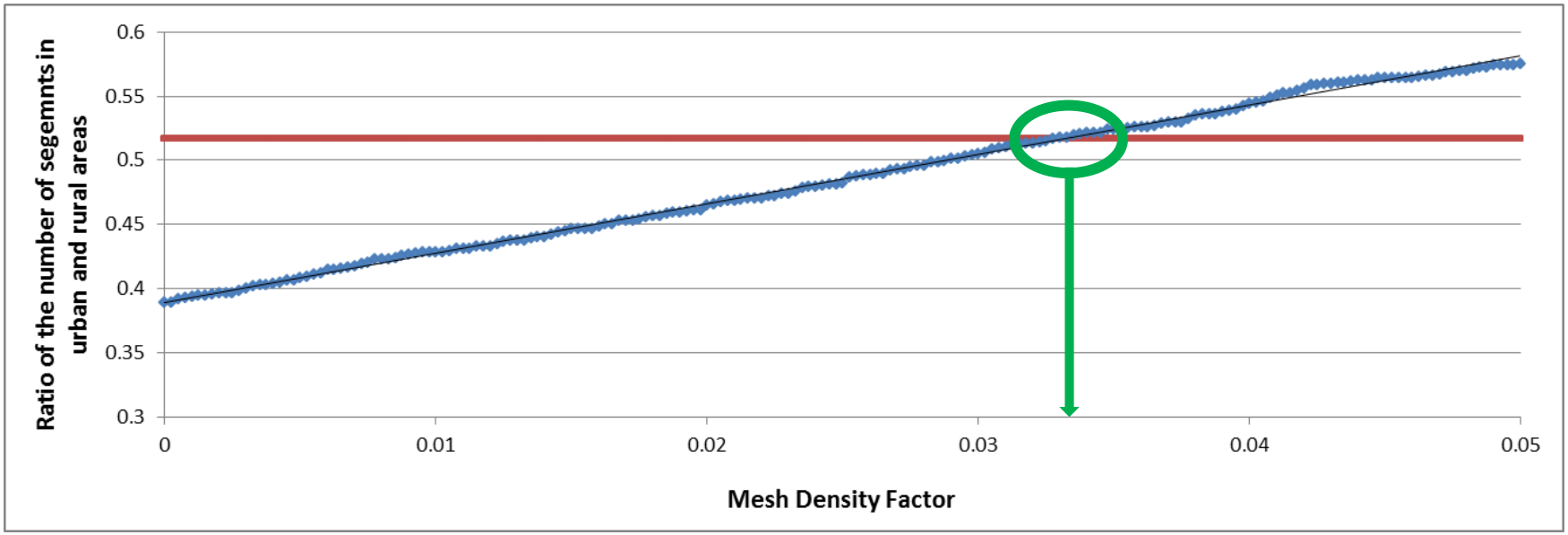
5: Structure preservation

INSUFFICENT road network density distribution



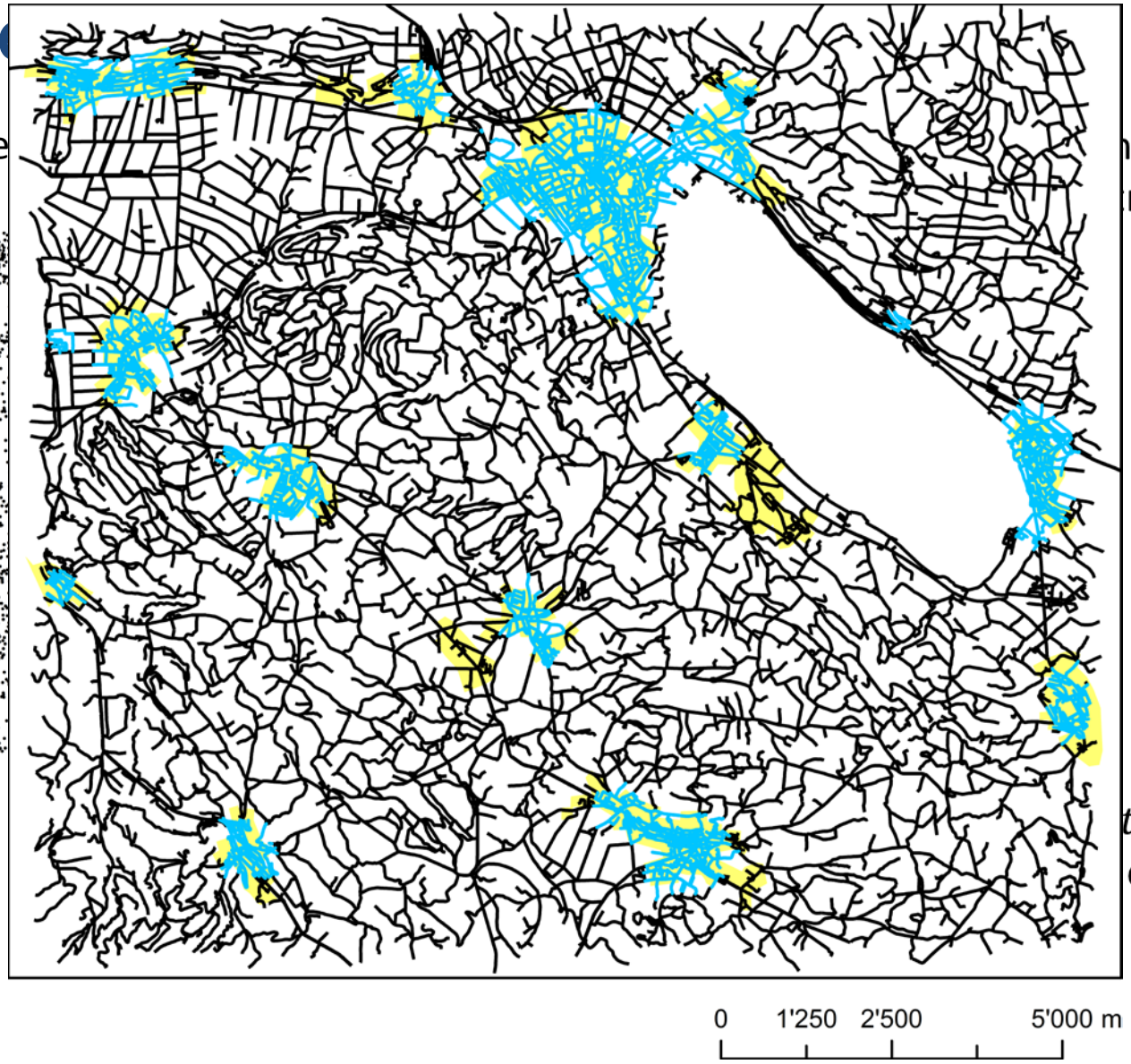
SUFFICENT road network density distribution

5: Optimal mesh density factor



5: Settl

1. Calculate ce



Conclusion

- **Several extensions and improvements optimize the result:**
  1. Bottom-Up traversal of the linear tree hierarchy
  2. Connection of linear patterns at a dissolved mesh
  3. Correction of roundabouts using a stroke algorithm
  4. Ensuring the accessibility of *points of interests*
  5. Model for retaining the network density distribution (using external layers or a density algorithm)

- **Quantitative und qualitative measures (inspection by swisstopo experts) revealed that the final results are of good quality**

Thank you for your attention!

References

Chen J, Hu Y, Li Z, Zhao R and Meng L, 2009, Selective omission of road features based on mesh density for automatic map generalization. International Journal of Geographical Information Science, 23(8):1013-1032.

Li Z and Zhou Q, 2012, Integration of linear and areal hierarchies for continuous multi-scale representation of road networks. International Journal of Geographical Information Science, 26(5):855-880.

Thomson RC and Richardson DE, 1999, The 'Good Continuation' Principle of Perceptual Organization Applied to the Generalization of Road Networks. In: Proceedings of the 19th International Cartographic Conference, Ottawa, Canada, 1215-1223.