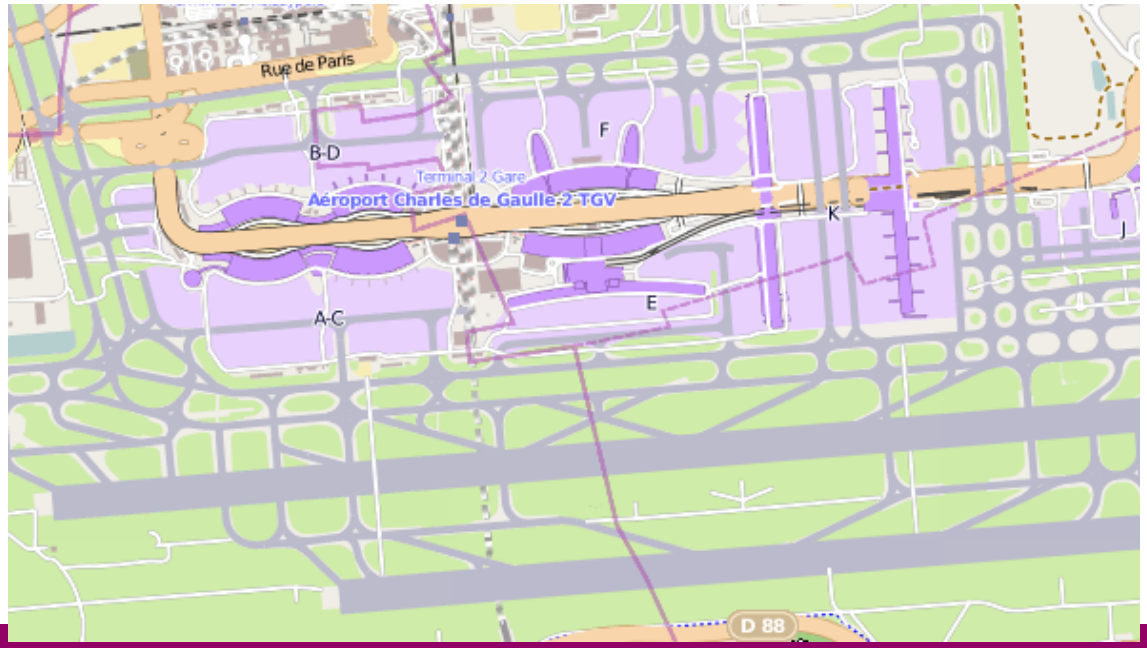
Generalising Unusual Map Themes from OpenStreetMap



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2014 ICA Workshop on Generalisation and Multiple Representation

Outline

- OpenStreetMap Unusual Data
- Airports Generalisation
- Railways Generalisation
- Heterogeneity and Orchestration
- Conclusion and Further Work

OpenStreetMap Unusual Data

- Unusual map themes

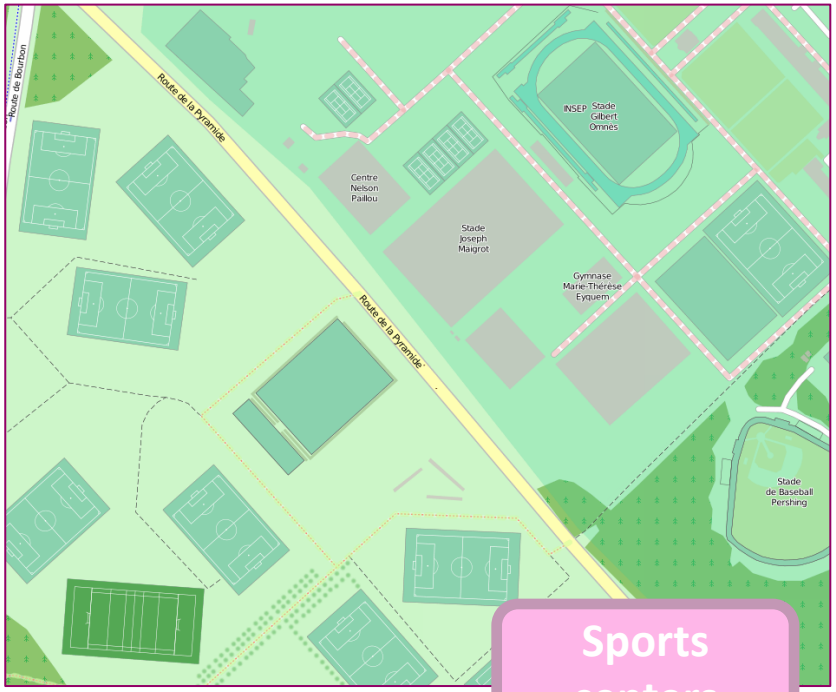
OSM

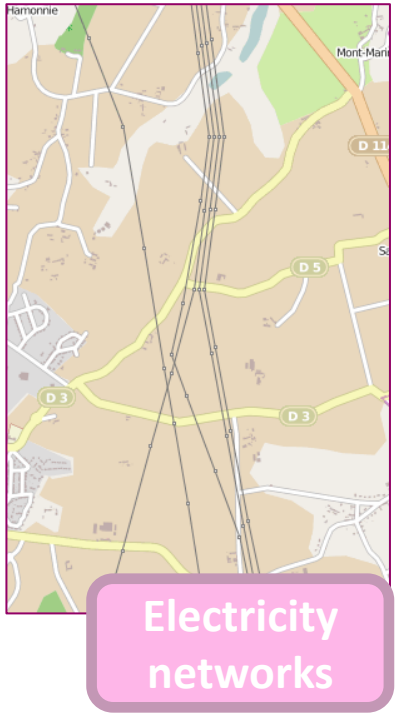
Airports

Railways

Heterogeneity

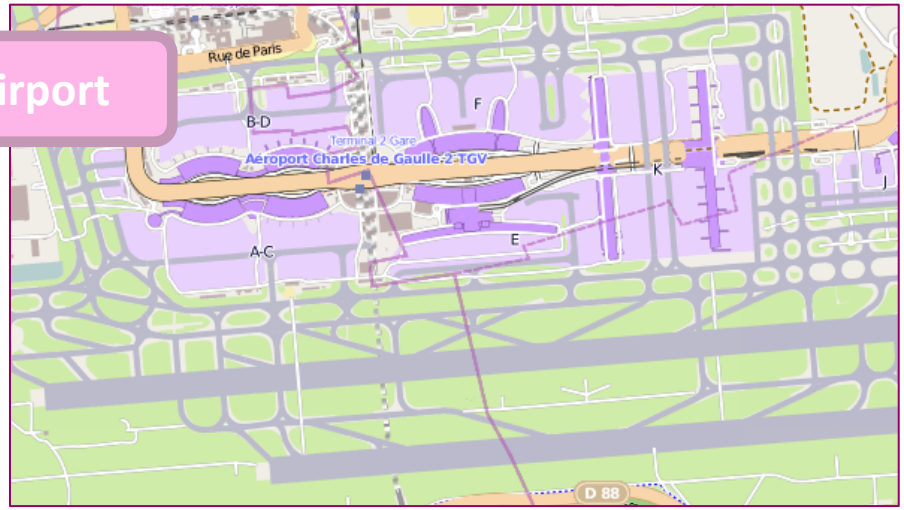
Conclusion





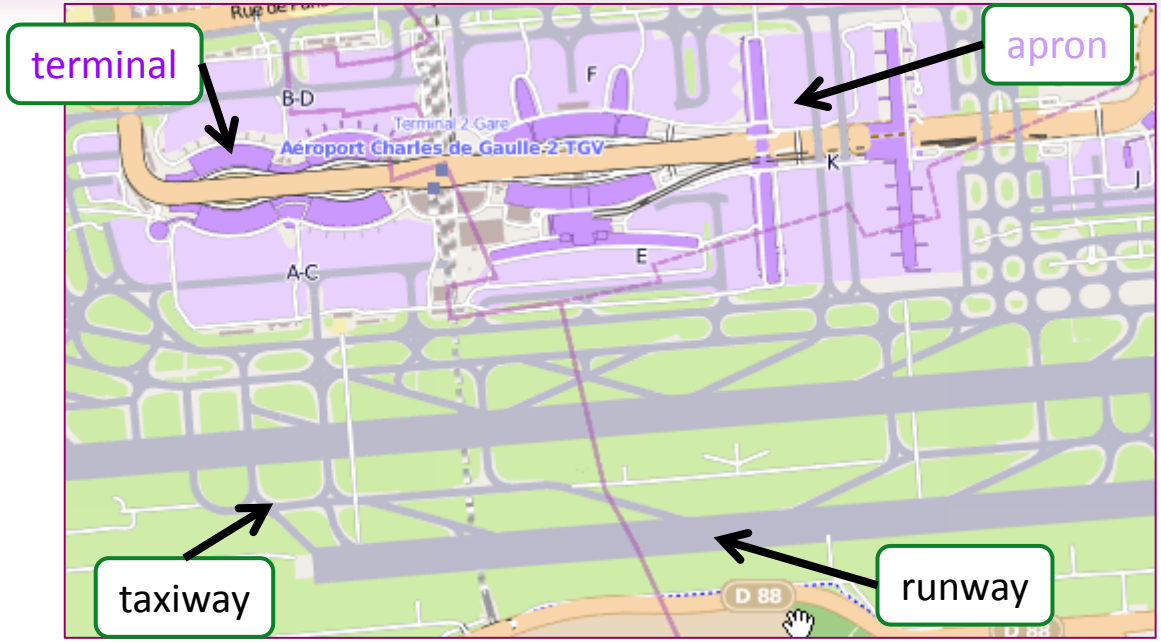
OpenStreetMap Unusual Data

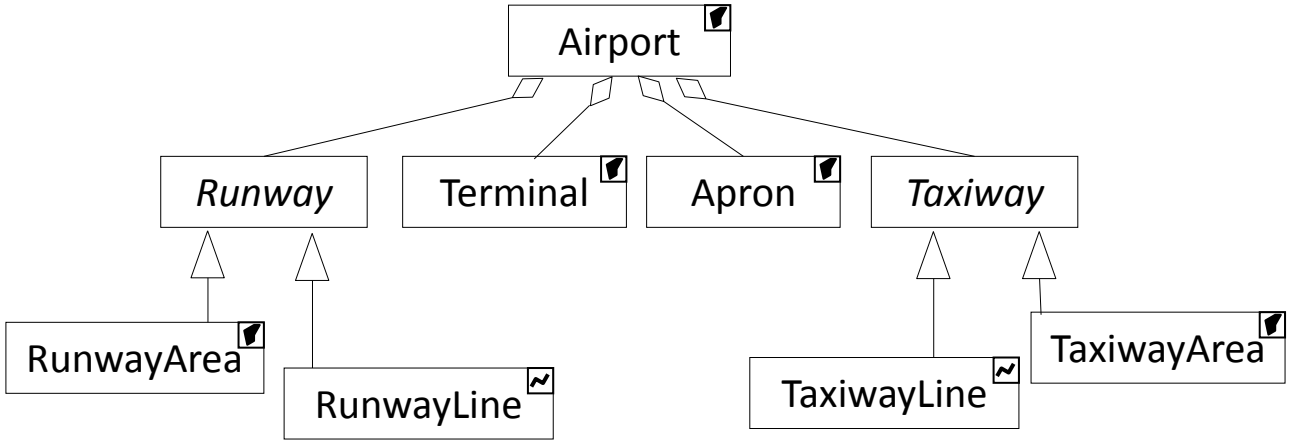
- Unusually detailed features



Airports Generalisation

Modelling airports





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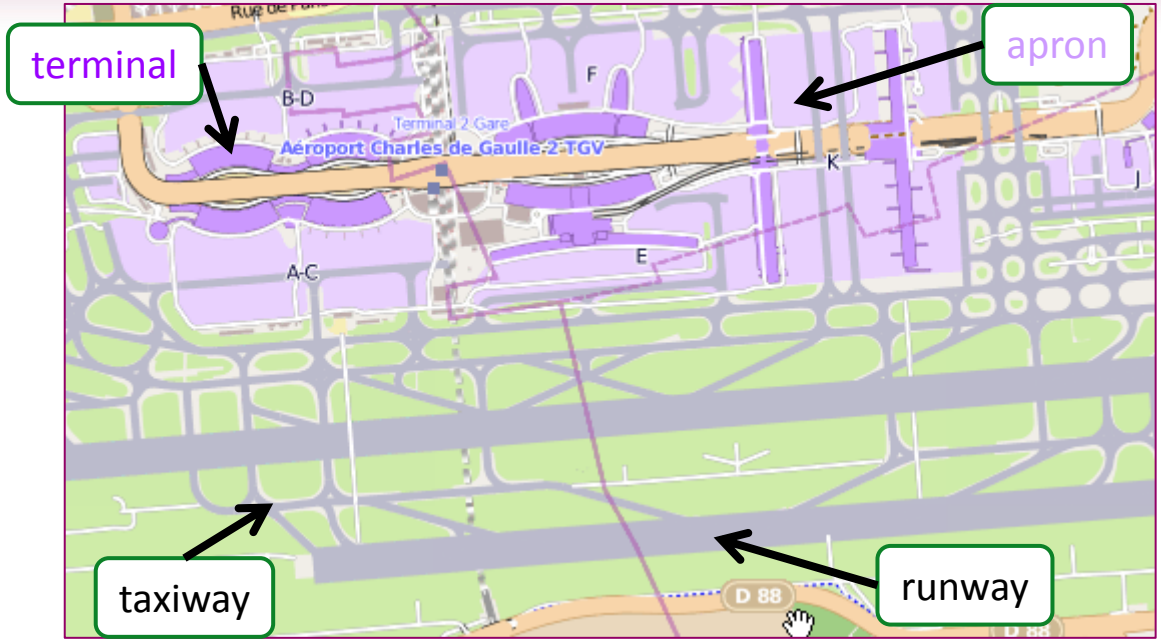
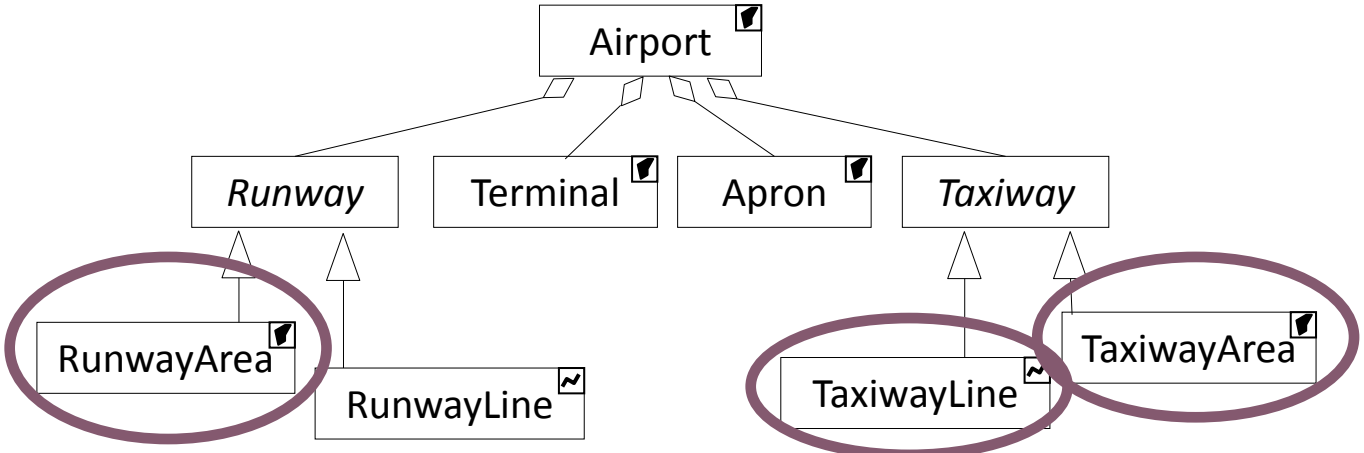
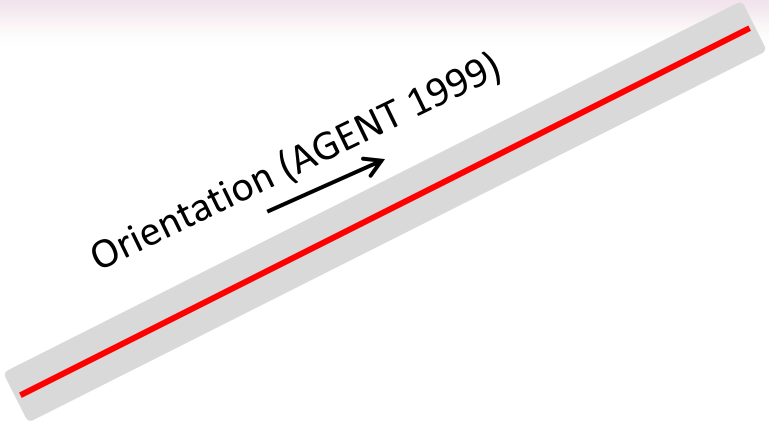
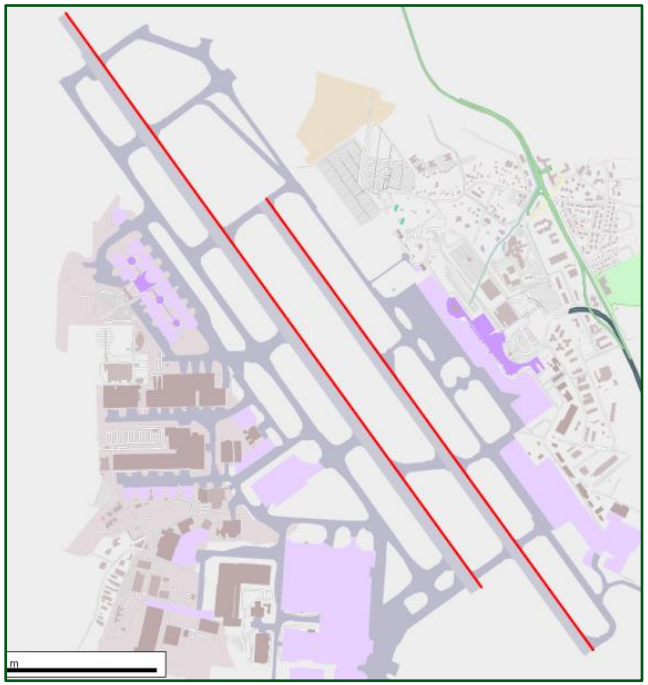




Airports Generalisation

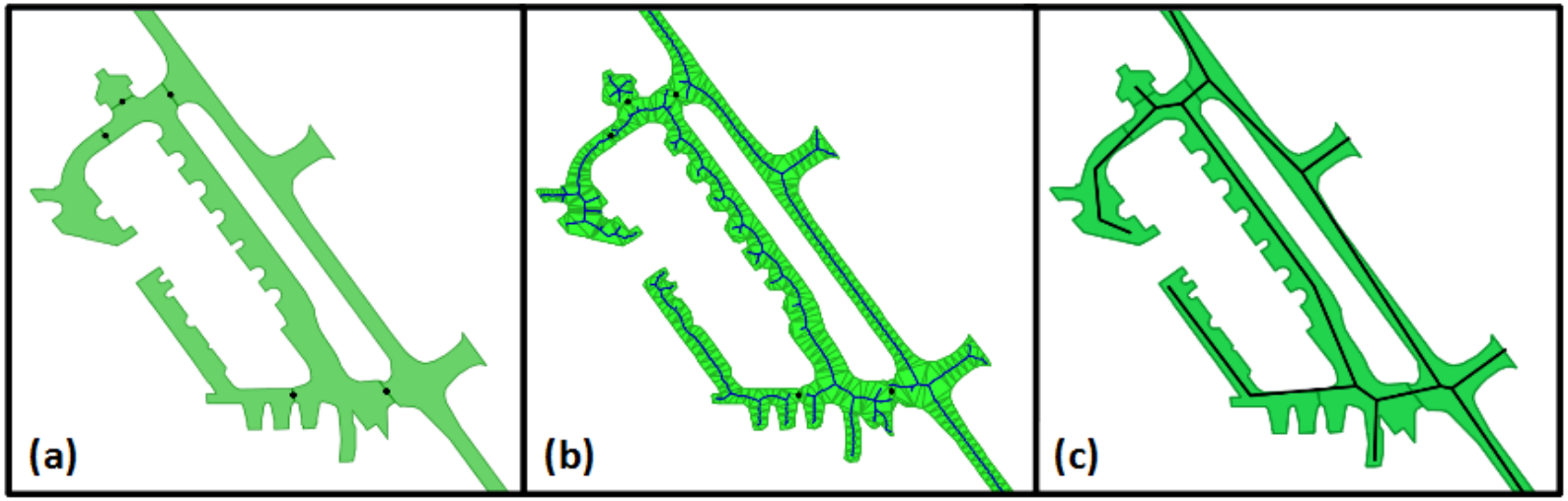
- Collapse Runway areas





Airports Generalisation

- Collapse Taxiway areas



Identify neighbourhoods between taxiway areas

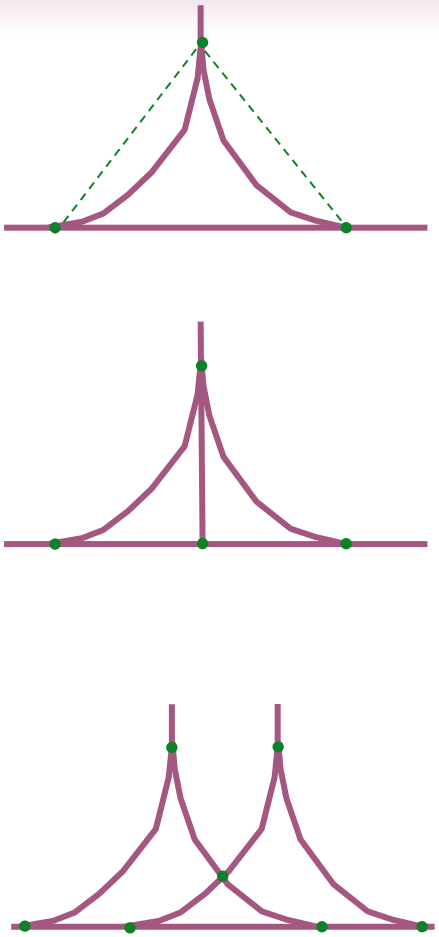
(several objects in OSM)

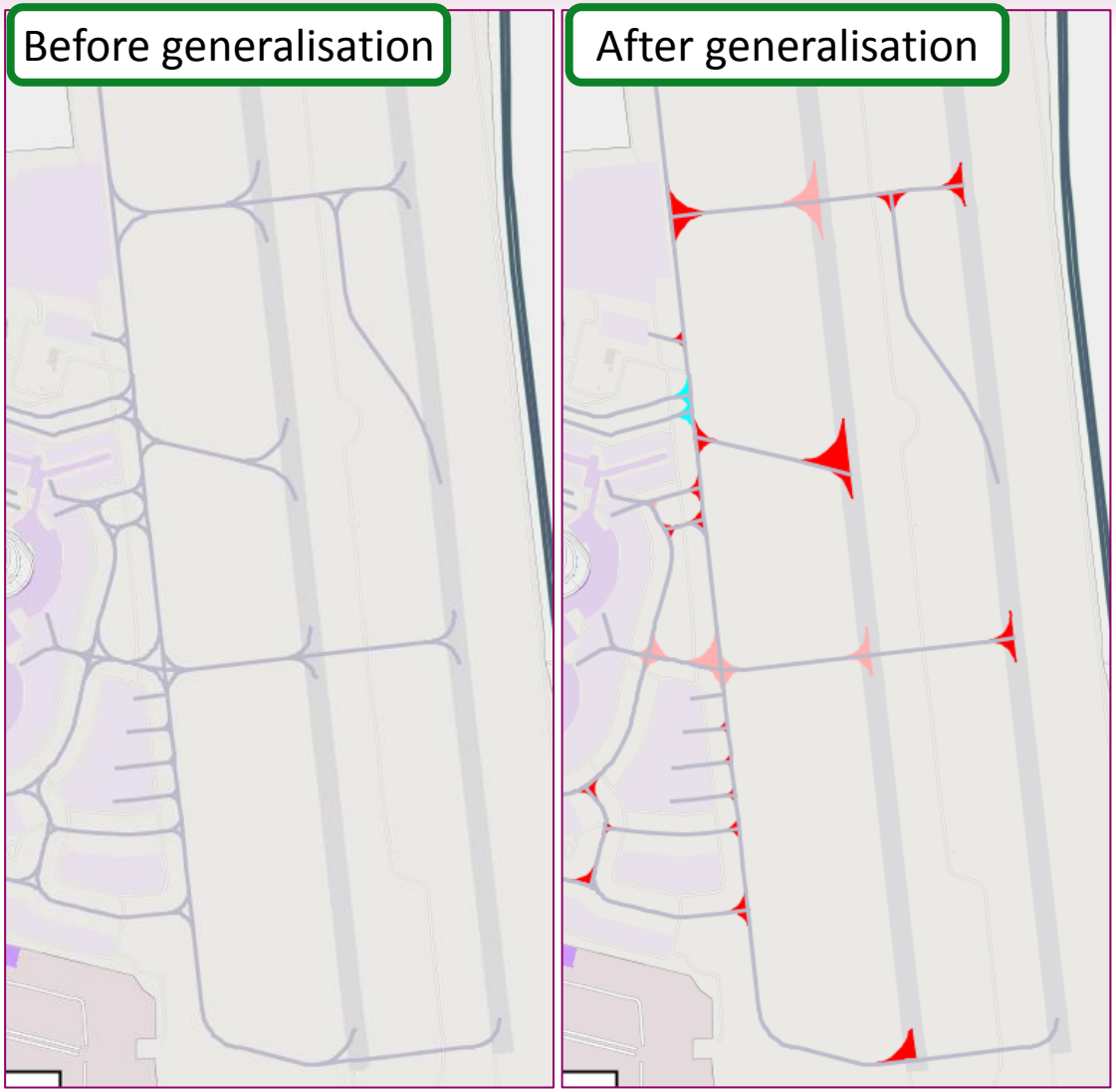
Compute TIN middle axis for each polygon

Filter, simplify and join middle axes

Airports Generalisation

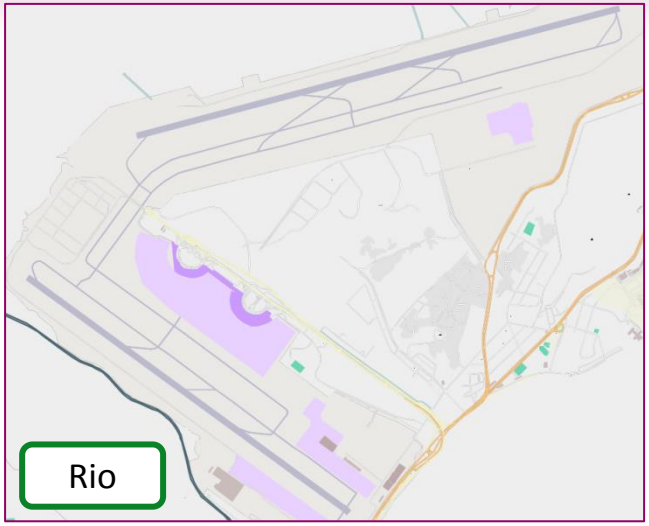
- Select Taxiway lines

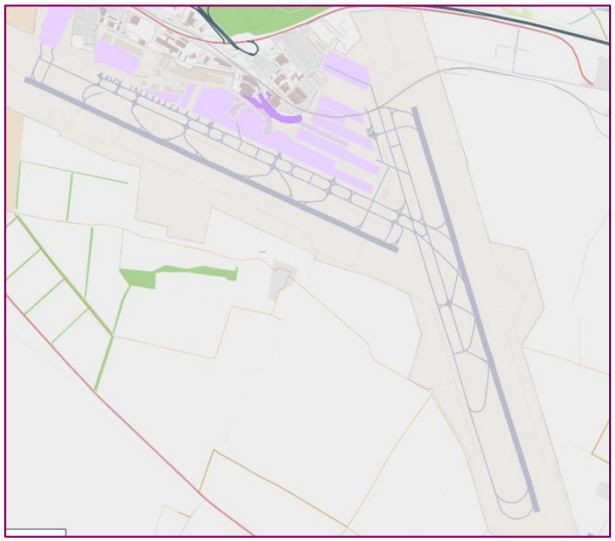


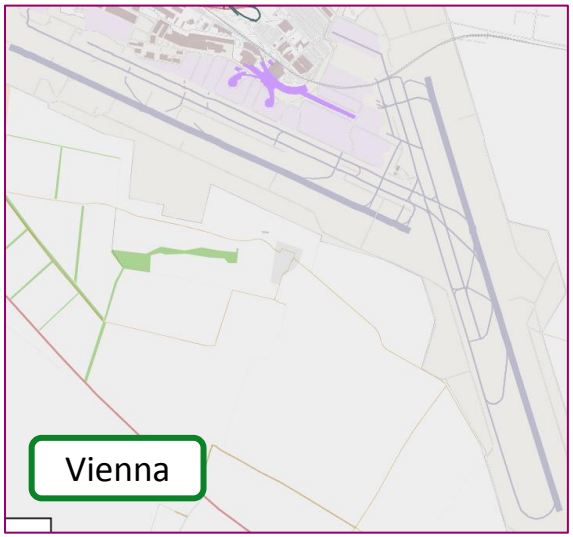


Airports Generalisation

- Results at 1:25k

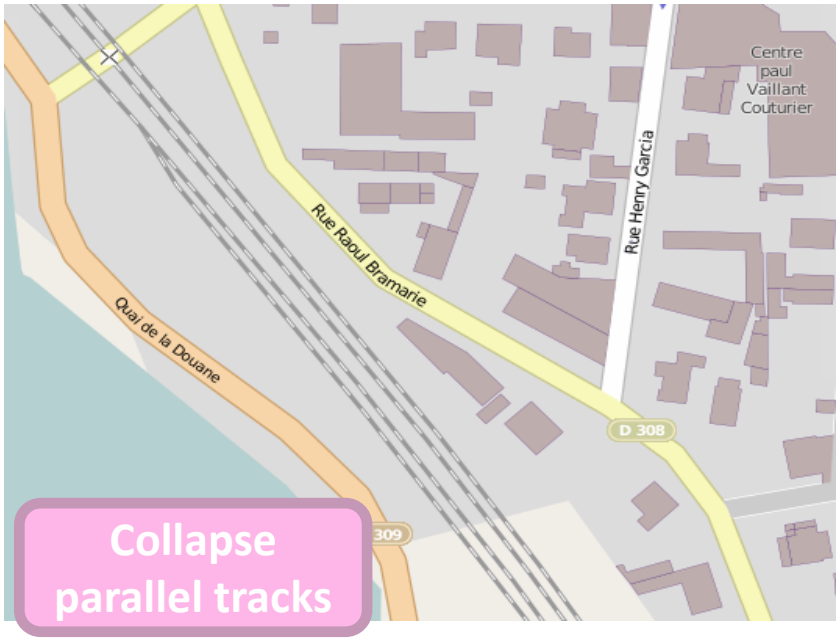






Railways Generalisation

- All tracks are captured in OSM



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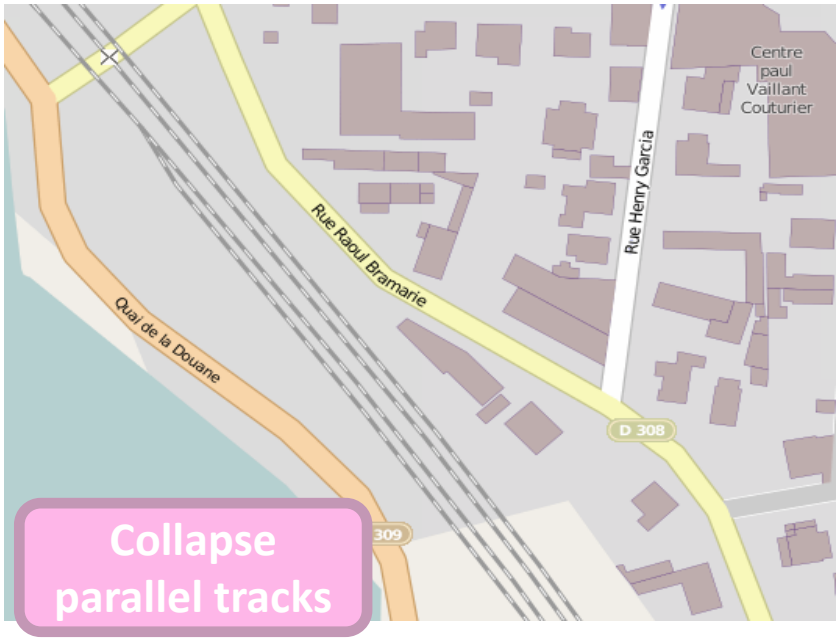
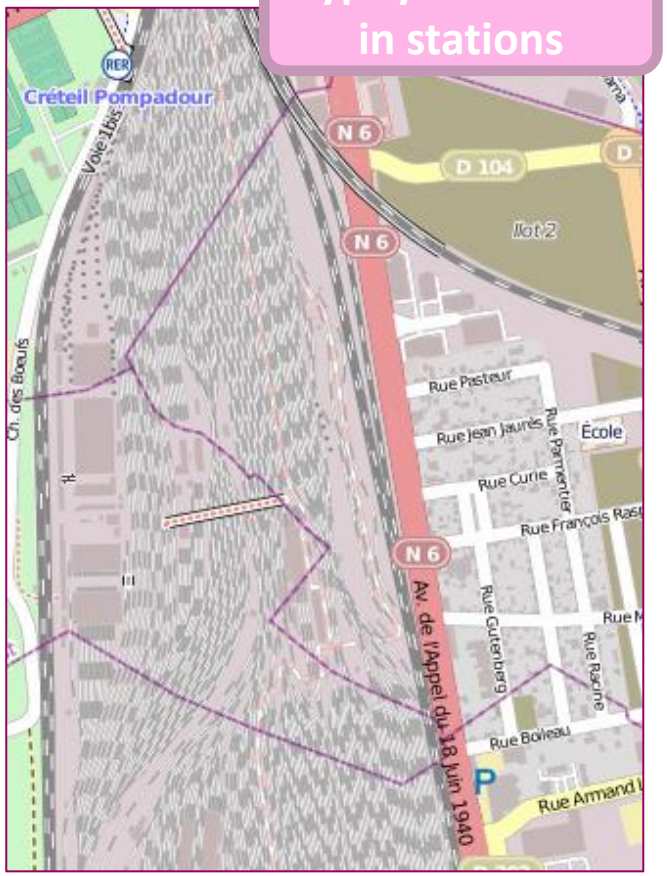


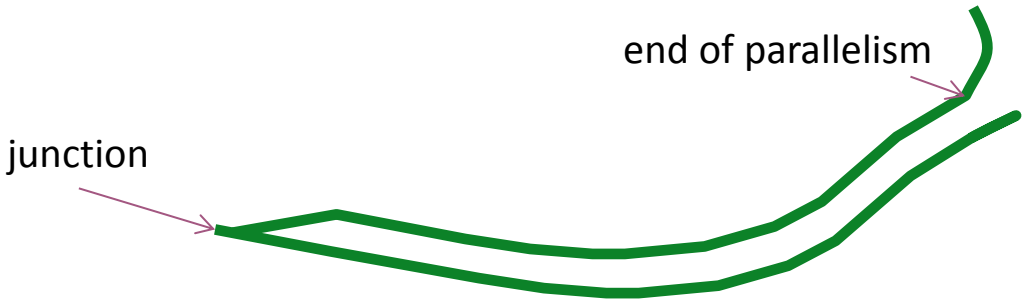
Collapse parallel tracks

Typify sidetracks in stations



Railways Collapse

- Parallelism detection
  - Finds *follow* relations (Touya et al 2012)



Railways Collapse

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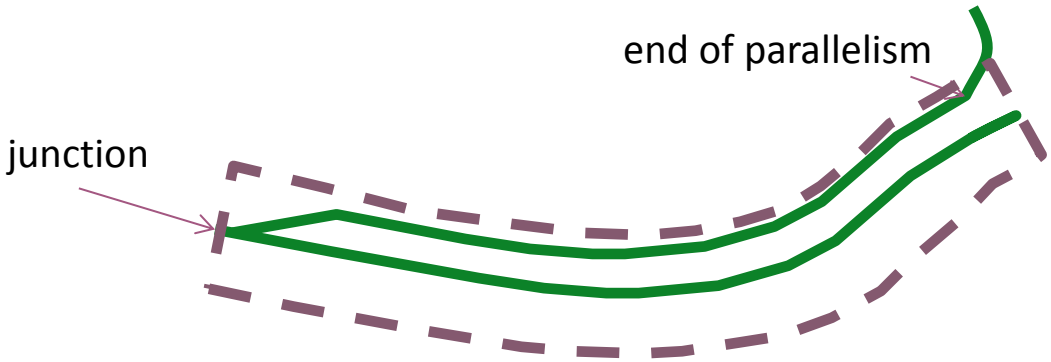
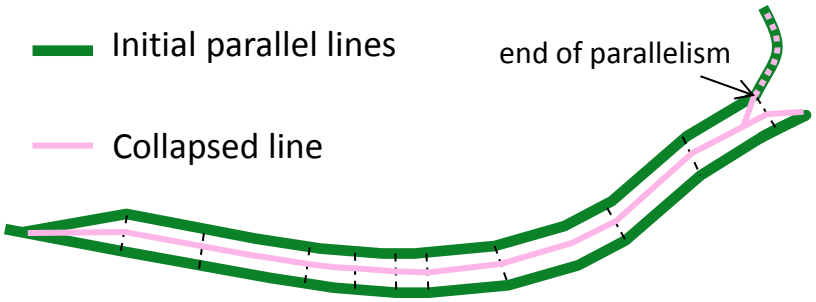
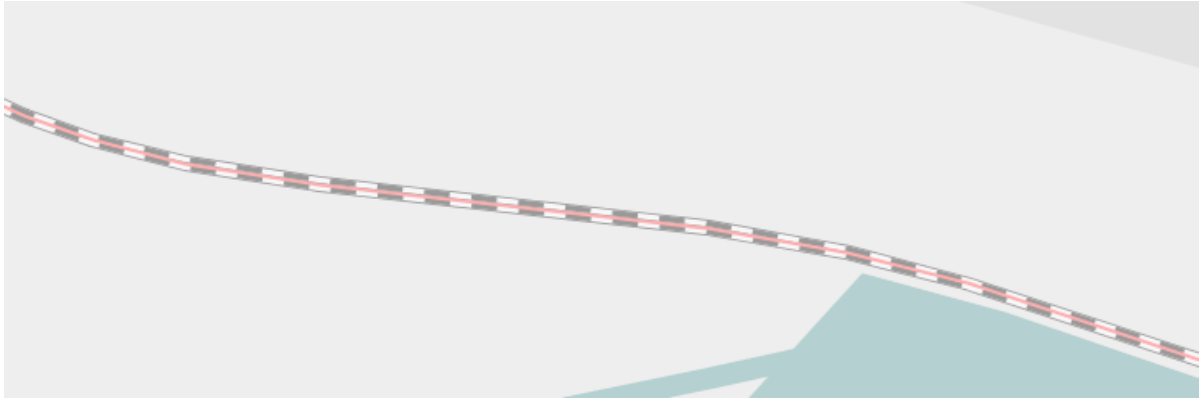


  - Use a buffer to find parallel neighbours

Railways Collapse

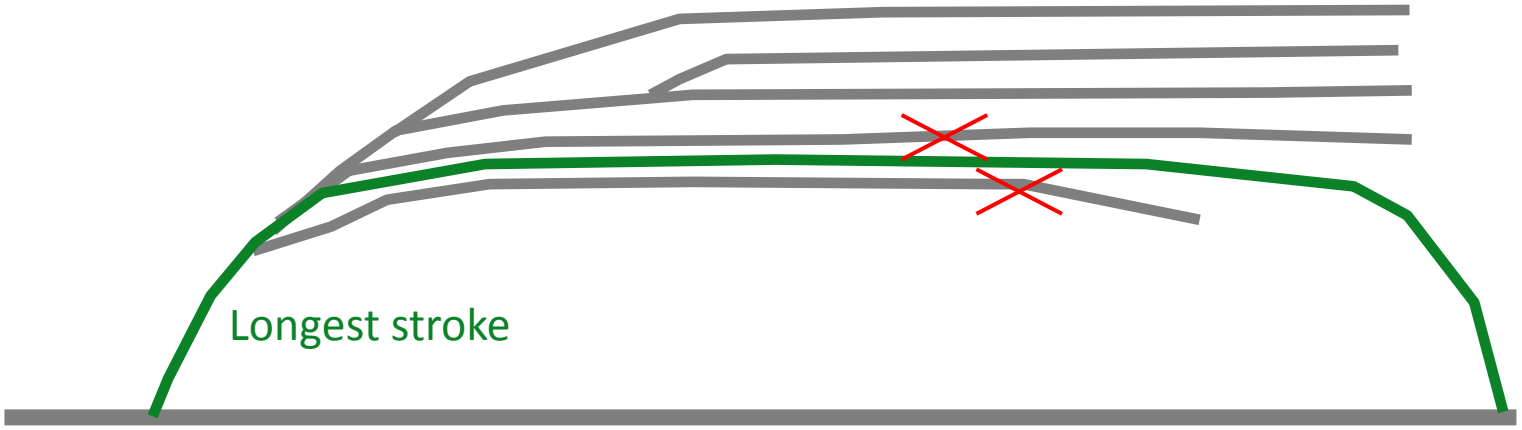
- Compute the middle line and connect where line meet or where parallelism ends





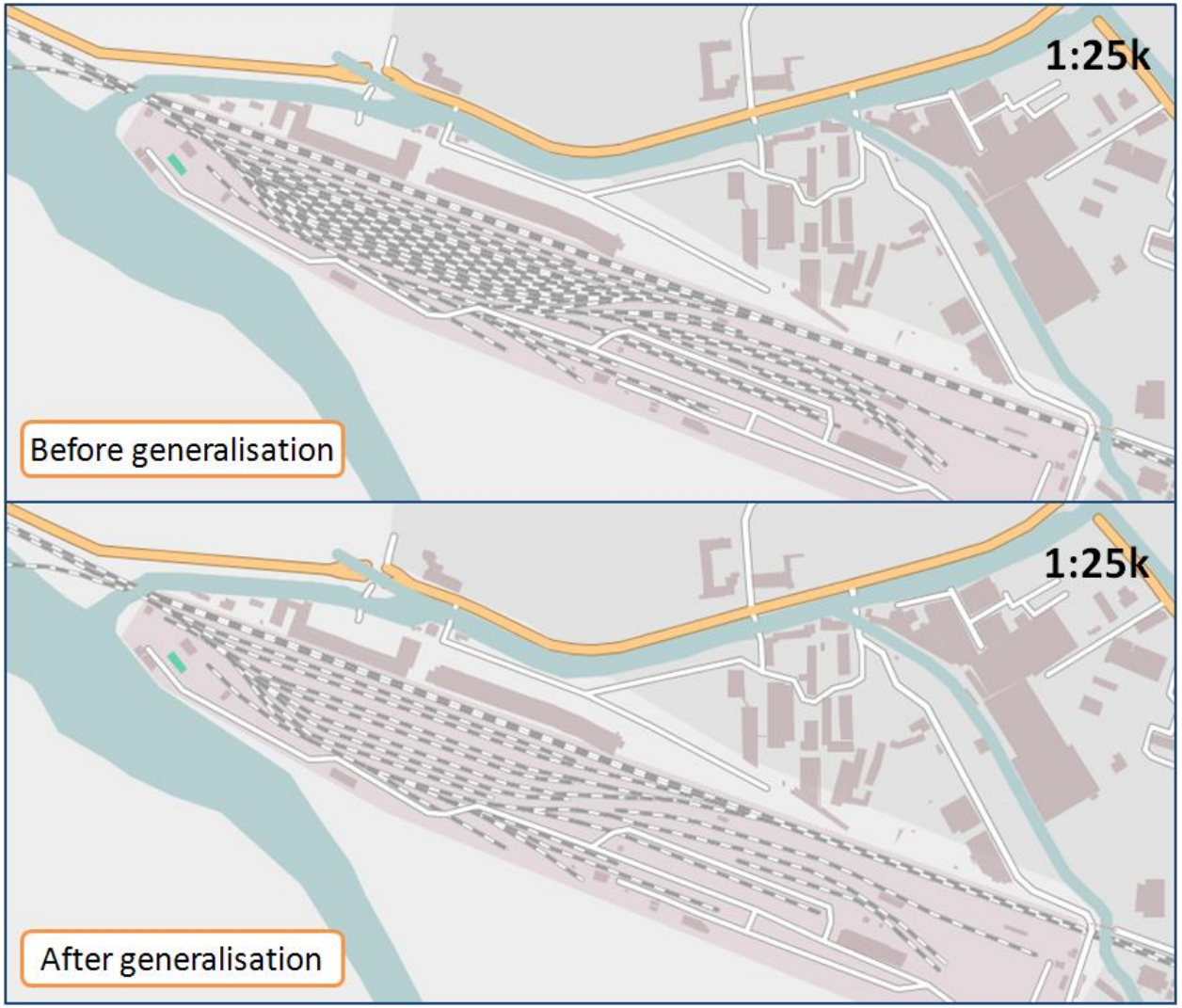
Sidetracks Typification

- Typification principles
  - Identify sidetracks (tags “railway” & “service”) and group by connexity
  - Compute “Strokes” inside each group
  - Strokes are sorted by descending order of length
  - Strokes too close to a long stroke are removed
  - Too short strokes are removed
  - Restore connectivity if broken



Sidetracks Typification

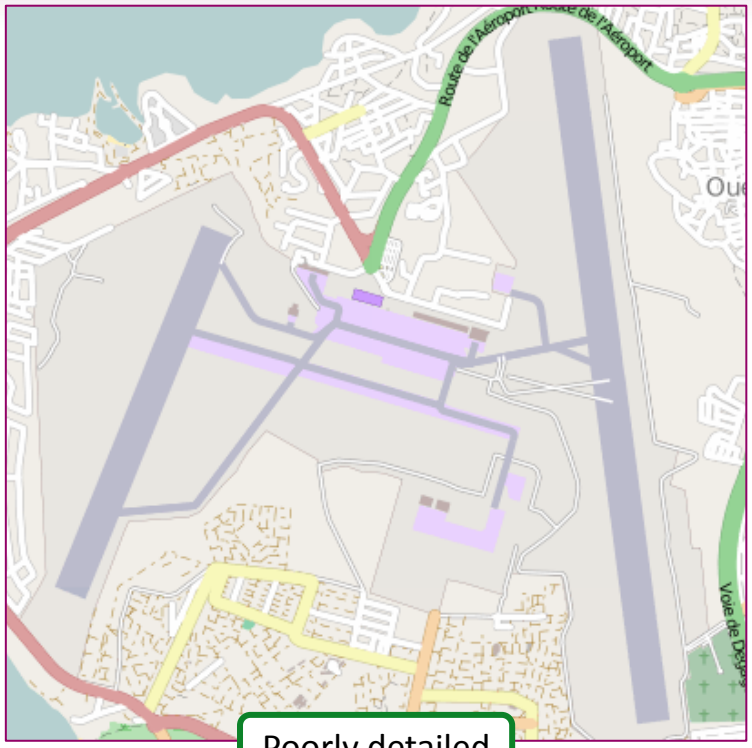
- Result at 1:25k



Heterogeneity and Orchestration

- Heterogeneity of quality and LoD

Highly detailed



Poorly detailed

- Orchestration of operators should be guided by LoD/quality in addition to context

Conclusion

- OSM diversity requires new algorithms
- Algorithms proposed for airports and railways
- Generalisation orchestration should consider LoD
- Implemented in GeOxygene open source platform

Further work

- Try LoD oriented orchestration
- Improve the proposed methods
  - e.g. identify sidetracks even when tags are wrong
- Generalise other unusual themes

Thanks for your attention
Any questions?

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http://oxygene-project.sourceforge.net/