

Task 2: Preparing and analysing road centre line models

Description

This exercise explains the workflow of space syntax analysis using road centre line (RCL) maps as the starting point. It includes different types of RCL maps to understand the different issues they raise. The task involves the preparation of the map (cleaning and simplification), followed by segment angular analysis. The results of different network measures can be displayed following the same steps from Task 1.

Stage 1 – Explore RCL maps

1) Prepare the project

- a) In the 'Layers Panel' in your QGIS project expand the 'road centre lines' group.
- b) Explore the differences in between OS Meridian 2, OS Open Roads and OSM (geometry representation of the street network, street segments included, and attributes)
- c) Create a new group of layers, selecting 'Add Group' in the Layers Panel context menu.
- d) Rename the group to "Task2 RCL".

Stage 2 – Clean RCL maps

2) OS Open Roads

- a) Start 'RCL Cleaner' from the SST toolbar
- b) Select "road_os_openroads" as the input layer to clean
- c) Do not select to snap endpoints
- d) Specify output type as memory layer
- e) Change the name of the cleaned memory layer to "road_os_openroads_cleaned"
- f) Select to load errors and unlinks and press OK
- g) Rename errors memory layer to "road_os_openroads_errors"
- h) Rename unlinks memory layer to "road_os_openroads_unlinks"

3) OS Meridian2

- a) Start 'RCL Cleaner' from the SST toolbar
- b) Select "road_os_meridian2" as the input layer to clean

- c) Specify snapping threshold to 3 decimals
- d) Specify output type as PostGIS (or memory if you don't have PostGIS)
- e) Click '...' and select the database and schema (ignore if you don't have PostGIS)
- f) Specify output name as "road_os_meridian2_cleaned" and press OK
- g) Select to load errors and unlinks and press OK
- h) Rename errors memory layer to "road_os_meridian2_errors"
- i) Rename unlinks memory layer to "road_os_meridian2_unlinks"

4) **OpenStreetMap**

- a) Start 'RCL Cleaner' from the SST toolbar
- b) Select "road_openstreetmap" as the input layer to clean
- c) Specify snapping threshold to 3 decimals
- d) Specify output type as shapefile
- e) Click '...' and select the file output location
- f) Specify output name as "road_openstreetmap_cleaned" and press OK
- g) Select to load errors and press OK
- h) Rename errors memory layer to "road_openstreetmap_errors"
- i) Rename unlinks memory layer to "road_openstreetmap_unlinks"

Stage 3 – Compare clean RCL maps

5) **Explore results**

- a) Compare the maps in group 'road centre lines' > 'clean' if you haven't completed the previous stage
- b) Compare errors layers of the three cleaned RCL layers, both the geometry and the type of error
- c) Compare unlinks layers of the three cleaned RCL layers
- d) Delete the 'road_openstreetmap_unlinks' layer you created: these are wrong and are not needed for analysis of OpenStreetMap.

Stage 4 – Simplify RCL maps

6) **OS Open Roads**

- a) Go to 'Processing' > 'Toolbox' to open the toolbox panel
- b) Type 'simplify' in the search and select the 'Simplify geometries' tool
- c) Select "road_os_openroads_cleaned" as input
- d) Set the tolerance value to 10
- e) Specify output file location and name "road_os_openroads_simp10"
- f) Repeat with tolerance 20

- g) Compare the results with the clean Meridian2 map.

7) **OpenStreetMap**

- a) Go to 'Processing' > 'Toolbox' to open the toolbox panel
- b) Type 'simplify' in the search and select the 'Simplify geometries' tool
- c) Select "road_os_openroads_cleaned" as input
- d) Set the tolerance value to 10
- e) Specify output file location and name "road_os_openstreetmap_simp10"
- f) Repeat with tolerance 20
- g) Compare the results with the simplified OS Open Roads and clean Meridian2 maps.

Stage 5 – Prepare RCL maps for analysis

8) **OS Open Roads**

- a) Start the 'Graph Analysis' tool from the SST toolbar
- b) In the map tab select the "road_os_openroads_simp10" layer
- c) In the unlinks tab load the "road_os_openroads_unlinks" layer
- d) Open the 'Verify Layer' tab and click 'Verify'
- e) Zoom to the unlink errors, notice the intersection with 4 segments
- f) Make the road layer editable (set 'Settings' > Snapping options...' if needed)
- g) Modify the segments so that only two segments cross at the unlink location
- h) Save the changes
- i) Click 'Update IDs' and then click 'Verify' again

9) **OpenStreetMap / OS Meridian2**

- a) Load the 'Graph Analysis' tool from the SST toolbar
- b) In the map tab select the "road_os_openstreetmap_simp10" or the "road_os_meridian2_cleaned" layer
- c) In the unlinks tab load the "road_os_meridian2_unlinks" layer
- d) Open the 'Verify Layer' tab
- e) Click 'Update IDs' and then click 'Verify'
- f) No errors to correct, the map data has the standard RCL representation with two segments crossing at the unlink location.
- g) In the unlinks tab deselect the unlinks layer ('-----')

Stage 6 – Analyse RCL maps

10) **OS Open Roads / OS Meridian2 / OpenStreetMap**

- a) Load the 'Graph Analysis' tool from the SST toolbar

- b) In the 'Map' tab select the input layer you want to analyse
- c) Tick "Segment map or road centre line map"
- d) In the 'DepthmapX Remote' tab select 'Segment', specify the radius of analysis as
'n,400, 800, 1200, 2000'
- e) Modify the output table name if necessary
- f) Make sure that you have depthmapXNet running in the background.
- g) Click 'Calculate' and wait