



Section : 10. Vector

Module : 10.5. Network Analysis

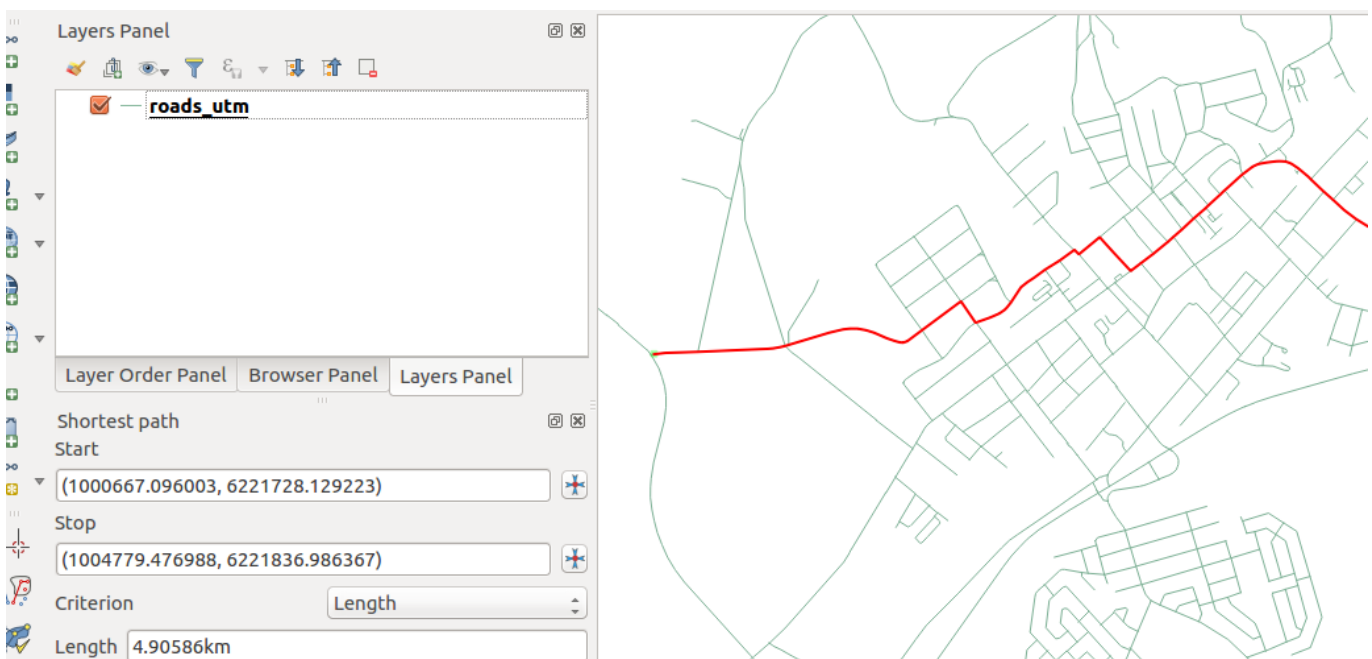
Network Analysis in Context

“A network is a set of connected lines. The networks are usually used to delineate rivers, road network. Network analysis studies the relationship between connected lines in terms of distance and time.”

Network analysis aims to establish if you can move from A to B and from B to C and is it possible to move from A to C. Network analysis is a type of connectivity analysis. Network analysis varies from simple analysis to complex analysis.

Complexity is achieved by analysis of the network and checking for features that give resistance to a route. Examples of features that bring resistance are the number of traffic lights and terrain, and this affects determining the shortest path between two points in a network. Traveling costs also vary because of these factors.

In this module, we look at how we can use QGIS to plan a route based on the shortest distance or the shortest time it takes to travel between two connected lines



You try:

Goal: To learn how to use the road graph plugin to calculate routes between two places.

Data: appendix3-local-data

- Open a new project and load the network layer.
- Open the Processing Toolbox
- Project the network layer to the specified CRS (name the resultant layer roads_utm_33s)
- Navigate to the Network analysis algorithms
- Open the Shortest path (Point to Point) algorithm

- Click on a Start point in the panel and choose a starting point on the network/roads layer (Use the projected layer)
- Click on Endpoint in the panel and choose an ending point on the network/roads layer (Use the projected layer)
- Repeat the procedure using different criteria.
NB: Explain your results in terms of distance and time

Name	Expectation
Speed	60 km/hr
Network layer	roads_osm.shp
CRS	UTM 33S WGS 84
Criterion	Length/time

Check your knowledge:

1. Which of the following statements is true:
 - a. A network should be uni directional. All roads should be travelling in the same direction
 - b. A road network can be bi directional. A road that goes in both direction
 - c. A vector layer that has units as decimal degrees can be used when estimating distances
2. Can a river be described as a network in the same way a road is:
 - a. No we cannot determine the shortest path between two points because people do not travel in a river
 - b. Yes, a river is a network and all operations done on roads can be done here
 - c. A river is a GIS data depicting natural phenomenon so it cannot be used
3. Plugins are only installed when online:
 - a. True
 - b. False

Module video tutorial:

- <https://www.youtube.com/watch?v=kqOvYUjDS0E>

Further reading:

- Grass.osgeo.org: <https://grass.osgeo.org/grass73/manuals/wxGUI.vnet.html>
- Vector_network_analysis: https://grasswiki.osgeo.org/wiki/Vector_network_analysis
- Network_analysis: https://docs.qgis.org/2.14/en/docs/training_manual/vector_analysis/network_analysis.html

Download the sample data for the lesson from http://changelog.qgis.org/media/images/lesson/worksheet/external_data/caa736ff463ea205f724611f9add80f172a4b80a.zip.