



## Section : 10. Vector

### Module : 10.5. Network Analysis

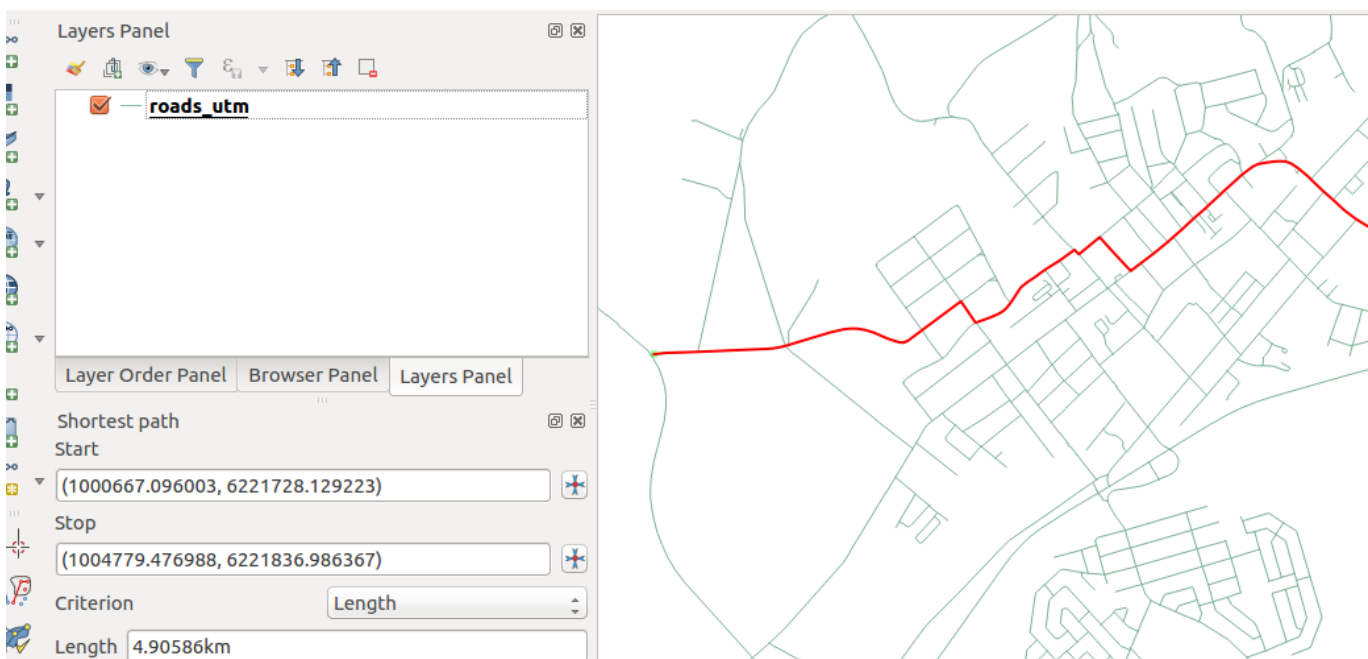
#### Network Analysis in Context

*“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](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](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](http://changelog.qgis.org/media/images/lesson/worksheet/external_data/caa736ff463ea205f724611f9add80f172a4b80a.zip).