

Transport Telematics

Winter semester 2019/2020



Lab 3

Routing

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Certification	1 st check	Resubmission until	2 nd check

Task

For the application **Routing** of our fleet management system, the optimal route of every vehicle has to be calculated (based on the geodatabase being completed in WP 200). A vehicle should start at the distribution center (Depot) and deliver goods to several customers (Orders). There are two vehicles available which have to supply 13 customers. By using the ArcGIS Network Analyst, optimized routes will be calculated while delivery costs are minimized.

Procedure

Execute following steps:

1. Create a feature dataset
2. Create a network dataset
3. Check the functionality of your network
4. Load the list of customers and define a distribution centre's location
5. Start the vehicle routing problem

More information: See Power Point slides!

The written elaboration has to contain:

- a brief documentation of the exercise
- the total time and total distance of every route (vehicle)
- a printout of the calculated routes of the two vehicles, the location of the distribution center and the customers (with North arrow, Grid and Scale Bar)

Weblinks

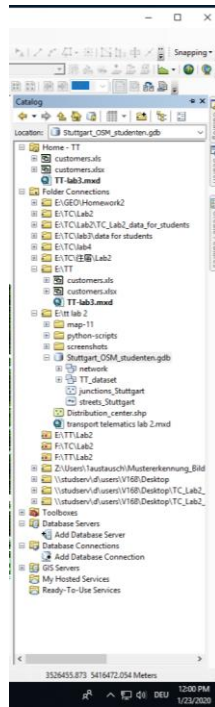
ArcGIS Resource center

<http://help.arcgis.com/en/arcgisdesktop/10.0/help/>

(Resource center >> Professional Library >> Extensions >>
Network Analyst >> Guide books >> A rcGIS Network Analyst Tutorial)

1. Processing steps

1. Create a feature and network dataset



2. Change attributes according to catalogues

New Network Dataset

Specify the attributes for the network dataset:

!	Name	Usage	Units	Data Type
	Length	Cost	Meters	Double
	Minutes	Cost	Minutes	Double
	Oneway	Restriction	Unknown	Boolean

Buttons: Add..., Remove, Remove All, Rename, Duplicate, Ranges..., Parameters..., Evaluators...

3. Choose evaluators and input expressions

4. Active Network Analyst to create new route. Then click on arbitrary points to define stop positions.

5. Load customer list, then create new shapefile to define distribute center with right coordinate system. This point is chosen using editor toolbar.
6. Use Network Analyst toolbar to choose “New Vehicle Routing Problem”. Load customers’ location by attributes of surname.
7. Add service time of distribution center to settings.
8. Add two car items with startdepotname, enddepotname, costperunittime and maxordercount.
9. After set layer properties, use solve button to calculate optimal routes.

2. Routing results

	Car 1	Car 2
Total Time	32.184213	38.641267
Total Distance	38.051694	49.922615
Start Time	1.22.2020 8:00:00	1.22.2020 8:00:00
End Time	1.22.2020 8:32:11	1.22.2020 8:38:38
Order Count	6	7
Total Cost	25.74737	30.913013

3. Routing Map

