DOI: 10.29302/Pangeea 20.07 **Geodesy**

THE ANALYSYS OF INTERES ROUTES IN EMERGENCY SERVICES

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ABSTRACT: *The subject oversees geomatics's general domain, especially GIS, for establishing some ways of offering accuracy in reaching some sort of superior precision using a strong plannification of Geospatial data base. In this way, we will try to put in work a special analysys exercise which would be built on vector data with real topology. Our work speaks not only to GIS experts, but to those who are working in emergency services: ISU, Police Departments.*

Keywords*: GIS; Geomatics; Network Analyst; Spatial Analysis; Proximity; Closest Facility;*

Introduction

The Project it's about Alba Iulia, a city with a population of about 70.000 citizens in wich the accesibility is a proper concern of city's people of influence which are aware of its duty into making new investments and of other parts which could lead into social-economical development.

This is the exact target I've been looking for in developing this project: a point of view on measuring the accesibility of Alba Iulia's driving routes, the right choosing of the driving routes, based on the driving speed, timing and the extra-timing used by the emergency vehicles.

The database creation

In this proposed method, a File or a Personal Geodatabase has been created using Arc Catalog. A personal Geodatabase is a database that can store, query, and manage both spatial and non-spatial data. It will contain the data of healthcare service providers, road network, and traffic tables. The road network data and the healthcare service providers' data were discussed earlier in the abstract (Fig. 1).

After correcting the road network errors, it is ready for being used in creating the network dataset that will be used in the network analysis.

To create a network dataset that renders traffic data, we need a Geodatabase that contains a line feature class, and the traffic data table created earlier. The line feature class will represent the road network and must be stored in a feature dataset. The traffic tables will represent the traffic data and its relationship with the road network.

The network dataset is well suited to model the transportation network. It consists of a set of edges that represent the links over which agents will travel, and a set of junctions that connect edges and facilitate navigation from one edge to another (Fig. 2).

Results and discussion

In this paper, we provide analysis and comparison of the results of the network analysis using two different methods. To navigate from one location to another, either the route with the least length (shortest route) will be selected, or the route with the least travel tim (best route) will be selected depending on the impedance factor you choose to solve for.

It's about the traffic network analysis and the creation of possible driving routes using barriers.

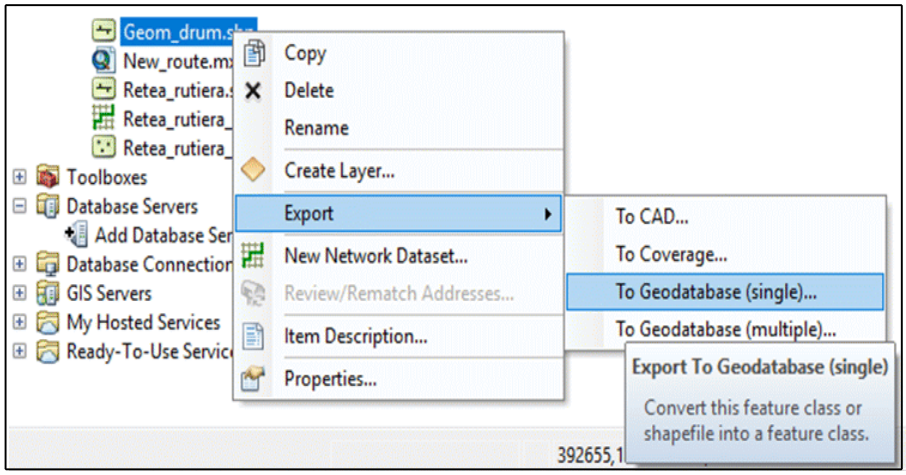

Fig. 1. Export shapefile to Geodatabase

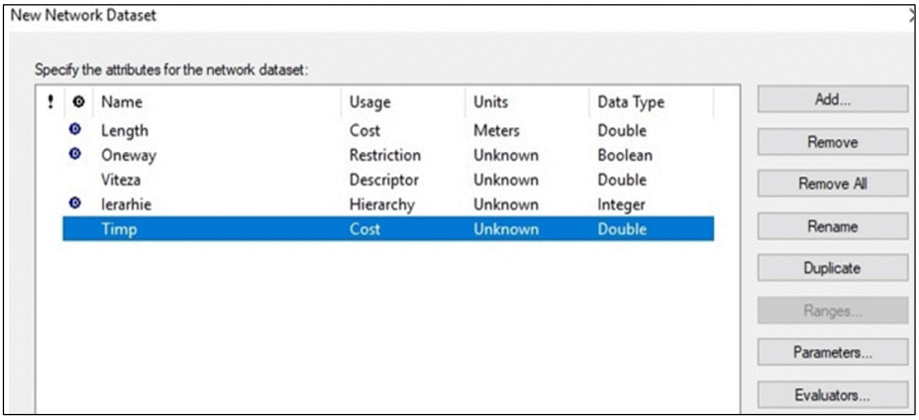

Fig. 2. Create Network Dataset

After generating the road networks, three layers came up this way:

- "Rute_Alba_Iulia_ND_Junctions" which contain the identified vertices along the initial layer;
- "Rute_Alba_Iulia_ND" which contains every polylines without attribute table;
- "Geometria_drumurilor_Alba" as a base layer from which the network has formed (Fig. 3).

A new route allows the mathematical solution to determinate the direction between two points, which can tell the shortest and the fastest route between ,,n" stops.

Creating such a route brings out development of feature Classes: stops, routes and points/lines/polygons.

For my project, I suggested uploading the locations in the ,,stops" feature Class, betweeen which the route will be determinated: ,,1Decembrie 1918" University-,,Spitalul de Urgenta Alba". In the most clean situation, in which there are no restrictions, the result could lead us into identify the shortest possible route and the determination of its attributes: the distance and the time based on the driving speed (Fig. 4, 5).

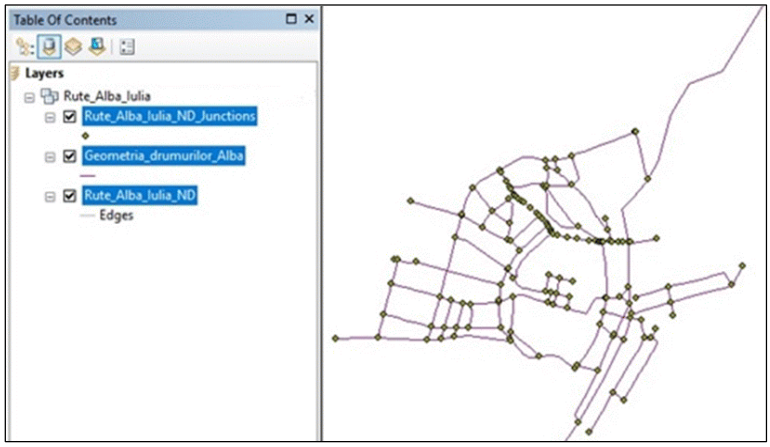

Fig. 3. Network analysis

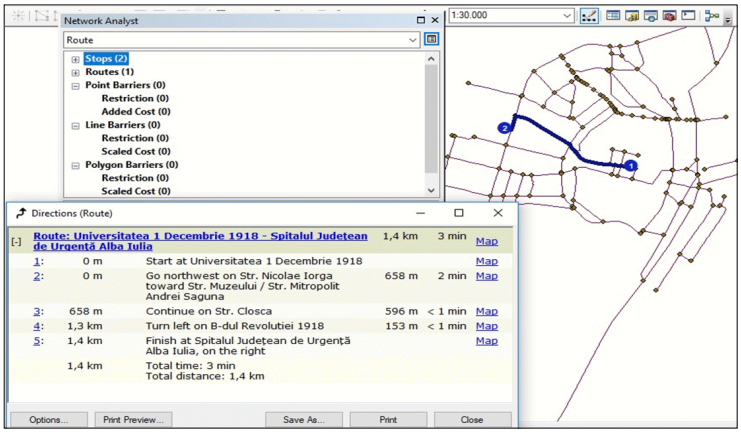

Fig. 4. The determination of the route without restrictions

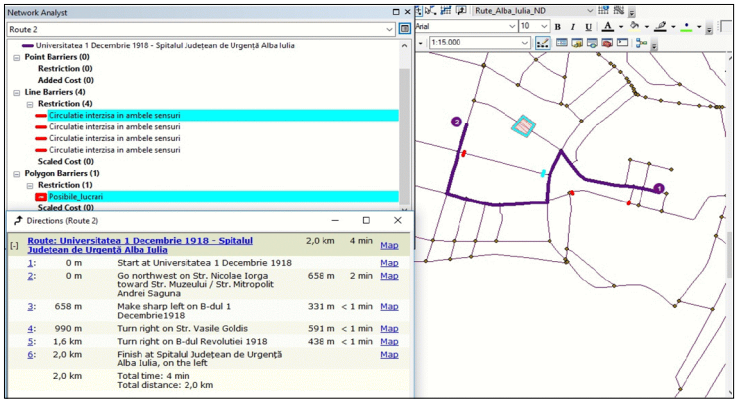

Fig. 5. The determination of the route with restrictions

In isolated cases, which are mostly about running into restrictions(unexpected working sites on the corridors of interests, car accidents) etc.

There will be added restriction feature Classes which will deny free acces, the result meaning creation of some type of other driving routes, not the fastest or the shortest to the destination.

Conclusions

In this project, a GIS-based network analysis was implemented and applied to Alba Iuila's road network. It focuses on finding the best route between two locations on the road network and finding the nearest healthcare service providers to an incident location based on the travel time. Also, the proposed method integrates well-known traffic data to be used in the analysis, which in turn produces more accurate results that are suitable for realistic road networks.

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