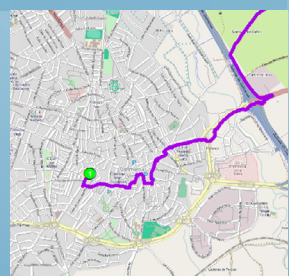
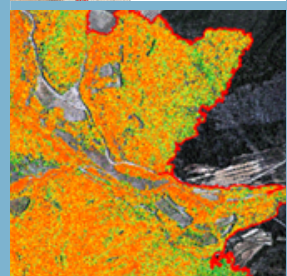
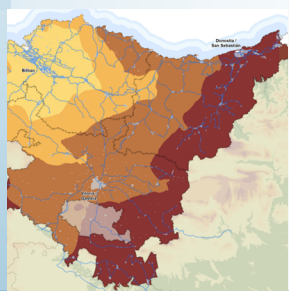
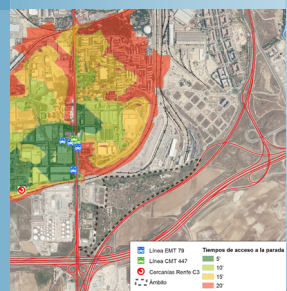
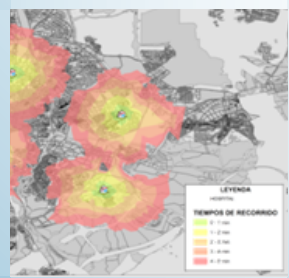
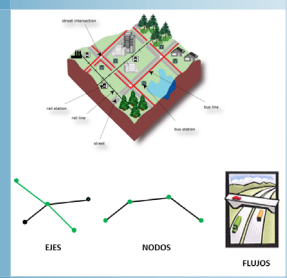
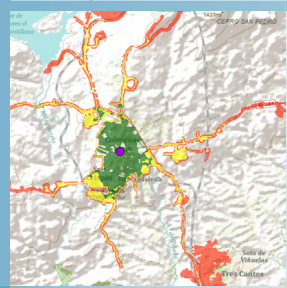
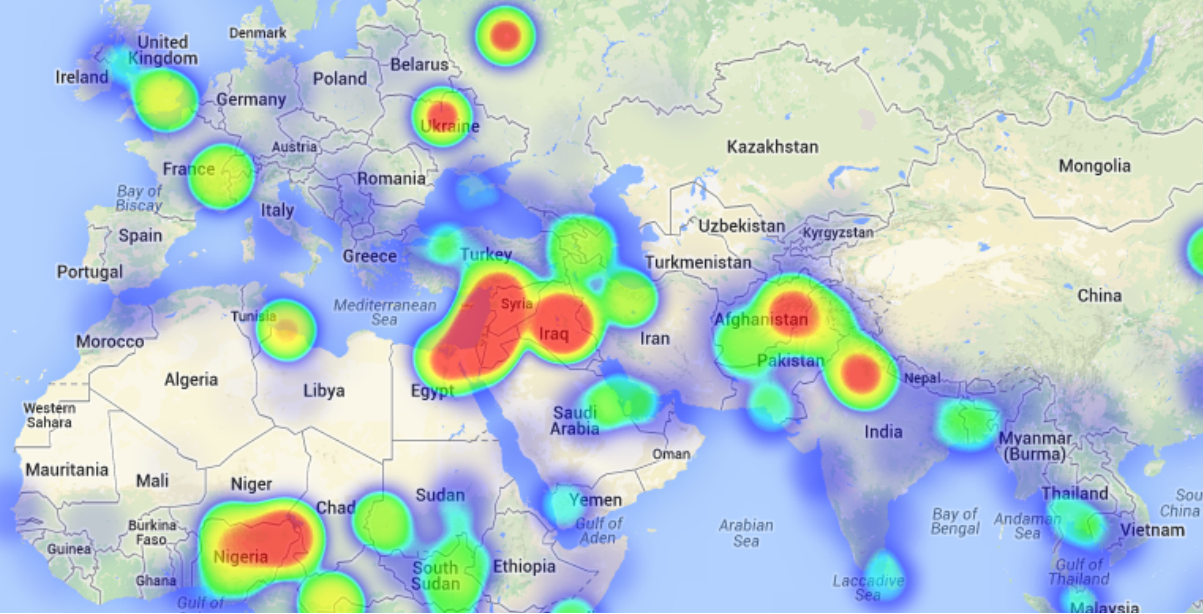
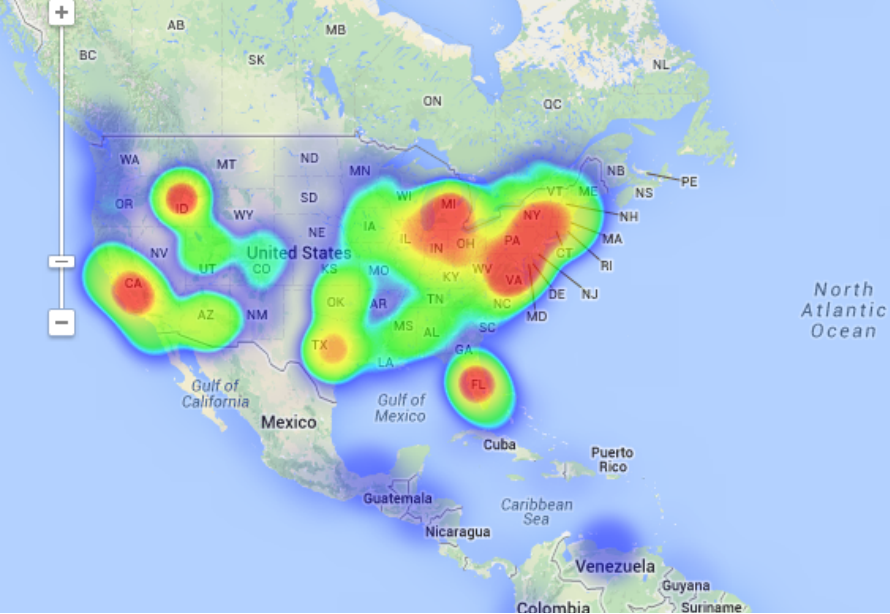


NETWORK ANALYST EXTENSION USING ARCGIS 10.X





TRAINING OVERVIEW



This course will qualify students in ArcGIS Desktop 10.x and, in particular, in ArcMap, ArcCatalog and ArcToolBox, for the development of projects related to transport networks (roads, channelization, electrical lines, etc.), accessibility and logistics.

With the Network analyst extension, the student will learn to design from scratch a transport network (private car, bus, railway, metro, etc.) as well as use commercial mapping for transport accessibility studies.

Students will be able to create a logical network system. They will learn to use the calculation operator of best route, service areas, closest facility, origin-destination cost matrix, design of vehicle routing problems and location - allocation.

GOALS



- Learn GIS applications from the beginning and in detail, ArcGIS for transport network studies, network analysis and logistics.
- Design, manage and analyse a transport network by nodes, integrate concept such as commercial speed, accessibility, impedance
- Gain the needed knowledge to generate impedances and attributes according to the type of network.
- Understand and manage at an advanced level the ArcGIS 10.3 Network Analyst extension.
- Obtain the best route plan for delivery, optimal location, accessibilities analysis, etc.
- Design tools applied to network analysis with Model Builder.
- Study geo-marketing concepts and analysis.





ONLINE FORMAT METHODOLOGY

The online format uses the online learning and technological platform Moodle, a telematics tool that works through the internet. It is a learning platform that provides students access to the training course content, fulfill the practical cases and consult the teaching staff, as well as availability to the resources and help at any moment.

The platform is available 24 hours a day, through which the student will be able to ask for help at any given moment. Instructors will reinforce the student's autonomy during its training process, supporting and clarifying any possible doubts that may arise along the course.

Therefore, the course is carried out through different areas available on the online platform and where the student can search for training material, download information, complete the practical exercises and take assessments to verify the assimilated knowledge. The teachers will offer progressively the basic information needed to work towards the completion of a final practical case.

STUDENT PROFILES



This course is aimed at students and professionals related to engineering, architecture, biology, geography, geology and environmental sciences interested in network management.

This course requires to have ArcGIS advanced knowledge, this is why it is recommended to have taken the "Advanced Geographic Information Systems course. ArcGIS Advanced (Vector and raster data model)".



INSTRUCTOR



Ricardo García Álvarez

With more than 15 years in the mapping and geographic information systems sector, Ricardo holds a bachelor's degree in Geography from the Universidad Autónoma de Madrid and a Master in Geographic Information Systems from the Universidad Pontificia de Salamanca.

Ricardo has experience in transport network project management, spatial accessibility studies with GIS, sustainable urban mobility plans, traffic studies (macro and micro simulation) and mapping development (orthorectification, digital restitution and photogrammetric consulting). As a teacher, he has given internal training courses for companies such as Tragsatec (Tragsa group) or Prointec (Indra Group).





1 - INTRODUCTION TO NETWORK ANALYSIS WITH NETWORK ANALYST

Definiton

Network Types

- Geometric
- Transport

Logical Network

Network components.

- Nodes
- Axis
- Flow

Identify the types of networks and its components.

2 - DESIGN OF A NETWORK

Digititise a specific network

Required attributes for a transport network (frequency, commercial speed, distance)

Network topology

Exercises (Create a simple bus network, fill in the necessary attributes) and evaluation



3 - NETWORK ANALYST EXTENSION COMPONENTS

Network Analyst workflow

Network Analyst toolbar in ArcMap

Network Analyst window in ArcMap

Identifying a Network in ArcCatalog

Network symbology

Practical exercises (activate the network analyst extension, Windows preparation and getting used to the Network Analyst toolbar in ArcMap) and evaluation.

4 - GENERATING A NETWORK DATASET

Layers selection

Allowed turns and turn tables

Connectivity policy

Overpasses policy

Impedances

- Cost
- Descriptors
- Restrictions

Directions Windows

Definition of Network Analyst in ArcCatalog for specific mapping, once created

Practical exercises (Generating a turn layer, generating the needed attributes for an overpass, description of impedances) and evaluation.

5 - GENERATING A NETWORK WITH COMMERCIAL MAPPING

Advantages of using commercial mapping (HERE Nokia) and Arctoolbox Street Data processing (specific impedances).

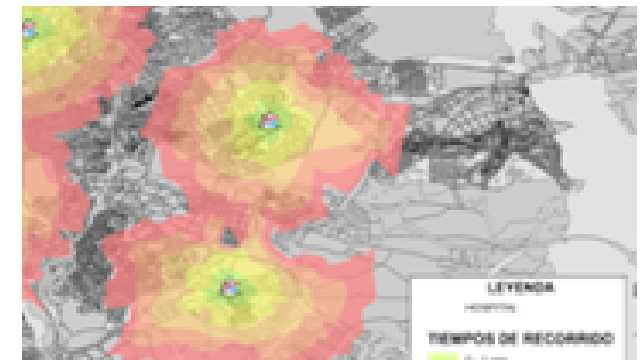
Identifying attributes (signals, turn restrictions, speed, travel duration, etc.).

Generating a Network DataSet with ArcToolBox for commercial mapping (Street Data processing).

Definition of Network Analyst in ArcCatalog for commercial mapping once created.

Practical exercises (generating a Network DataSet with ArcToolBox Street Data processing with commercial mapping of Colmenar Viejo (Madrid, Spain)).

Evaluation (Hoyo de Manzanares, Madrid, Spain)





6 - NETWORK ANALYSIS

Network Analyst toolbox bar in Arcmap

Best route analysis

Service area analysis. Isochrone maps or accessibility times

Closest facility installation

Origin - Destiny Matrix Analysis

Vehicle routing problema analysis. Fleet analysis

Location - allocation analysis. Pick up / delivery routes

Practical exercises (Best delivery route for pharmacies, geomarketing study of clients for repair shops, accessibility to public transportation stops, etc.).

Evaluation.

7 - PRACTICAL APPLICATIONS FOR DIFFERENT TRANSPORT NETWORKS

Territorial accessibility by private car

Territorial accessibility by public road transport

- Coverage of the public transport stops (dispersion of time)

- Public transport network optimization. Lines and stops.

Accessibility by railway transport

Practical exercises about accessibility (mapping interpretation).

Evaluation. Practical case.

8 - GENERATING NETWORK GEOPROCESSING TOOLS WITH MODEL BUILDER

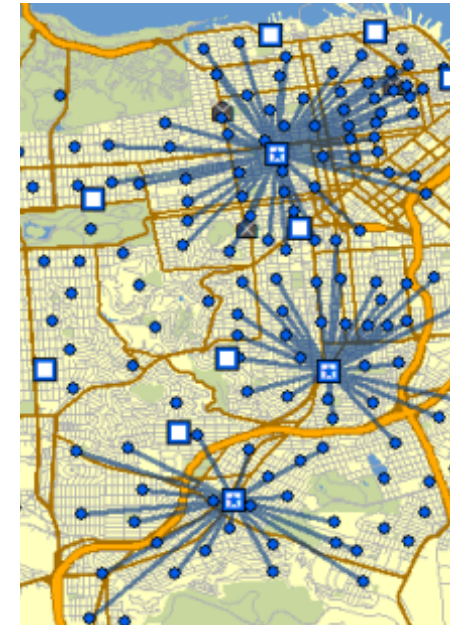
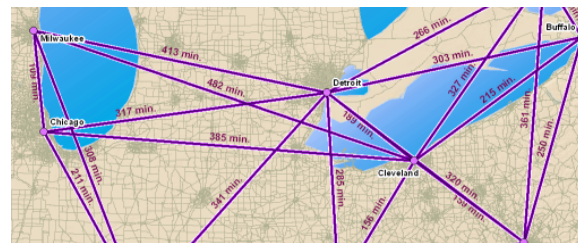
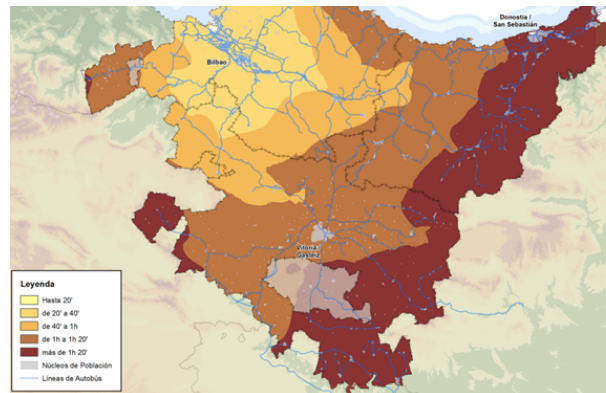
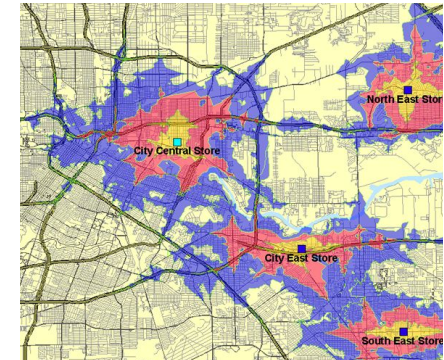
Introduction to Model Builder

Automating the process to calculate influence areas of public transport stops

Automating the process in the calculation of optimum locations

Practical exercise. Generating a tool.

Final Evaluation.





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