United Nations Economic Commission for Europe
Inland Transport Committee
Working Party on Transport Statistics
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INSTITUT D'ESTUDIS TERRITORIALS
GENERALITAT DE CATALUNYA
UNIVERSITAT POMPEU FABRA

"The GIS application of the UN/ECE E-Road Census 2005: a tool for transport analysis and planning"

INSTITUT D'ESTUDIS TERRITORIALS

A consortium between the Department of Regional Policy and Public Works of Catalonia and the *Pompeu Fabra* University

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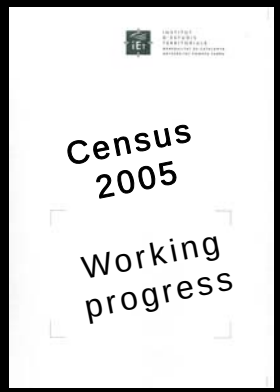
The 1985, 1990, 1995, 2000 & 2005 E-Road Censuses

Recommendations to Governments:

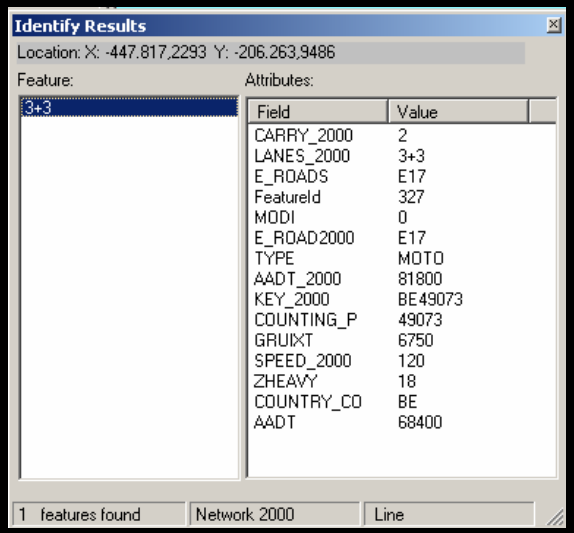
- Coverage of the Census
- Purpose of the Census
- Scope of the census
- Comparability with the results of previous Census
- Categories of vehicles to be counted
- Values to be calculated
- Design of the counts
- Characteristics of E-Roads
- Preparation and publication of Census Data



The 1985, 1990, 1995, 2000 & 2005 E-Road Censuses

Preparation and publication of data recommendations to Governments:

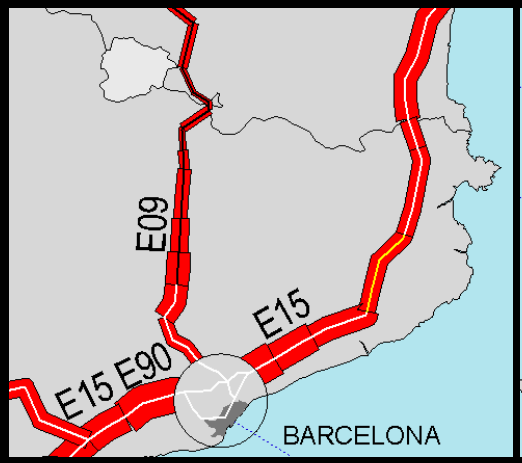
- Characteristics of E-Roads (Tables 1&2)
- Number and nature of counting posts (Table 3)
- Motor traffic distribution by vehicle categories: total, night, holiday & peak hour traffic (Tables 4&4b)
- Length and usage of roads (Table 5)
- Motor traffic density maps (Table 6)
- Motor traffic density data at counting posts on E-Roads (Table 7)

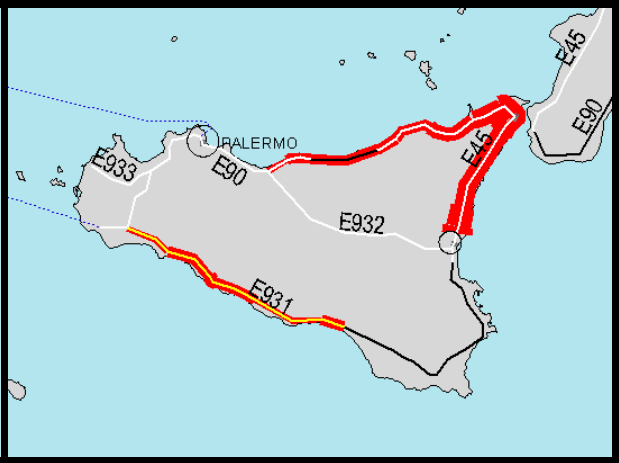


The 1985, 1990, 1995, 2000 & 2005 E-Road Censuses

Recommendations concerning Traffic Density Maps:

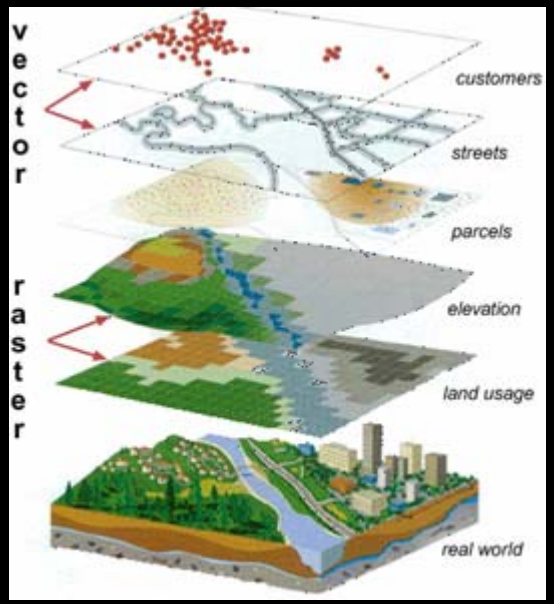
- Counting posts to be shown on the maps
- Predefined scale maps according window size
- Average Annual Daily Traffic representation ("traffic buffers": width and interval classes)
- Representation of E-Road categories: motorways, express roads and normal roads
- E-Road and counting posts numbers
- Names of important towns and localities



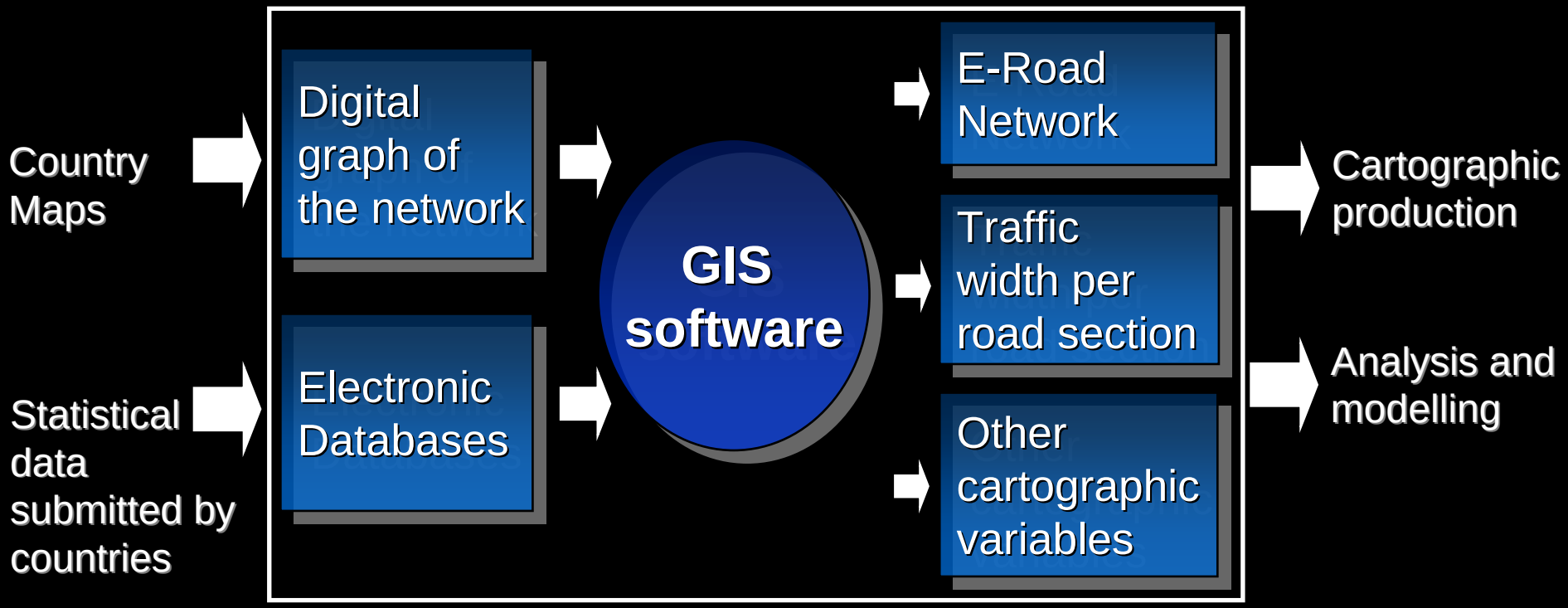


What is a GIS?

- GIS is an electronic tool designed for capturing, storing, analysing and presenting geocoded information (geographic, social, economic, political, transport, environmental, etc.)
- GIS uses the computer to pose and answer geographic questions by arranging and displaying data about "places" in a variety of ways, such as maps, charts and tables
- GIS is the modern extension (electronic mapping) of the ancient mapmaking tradition



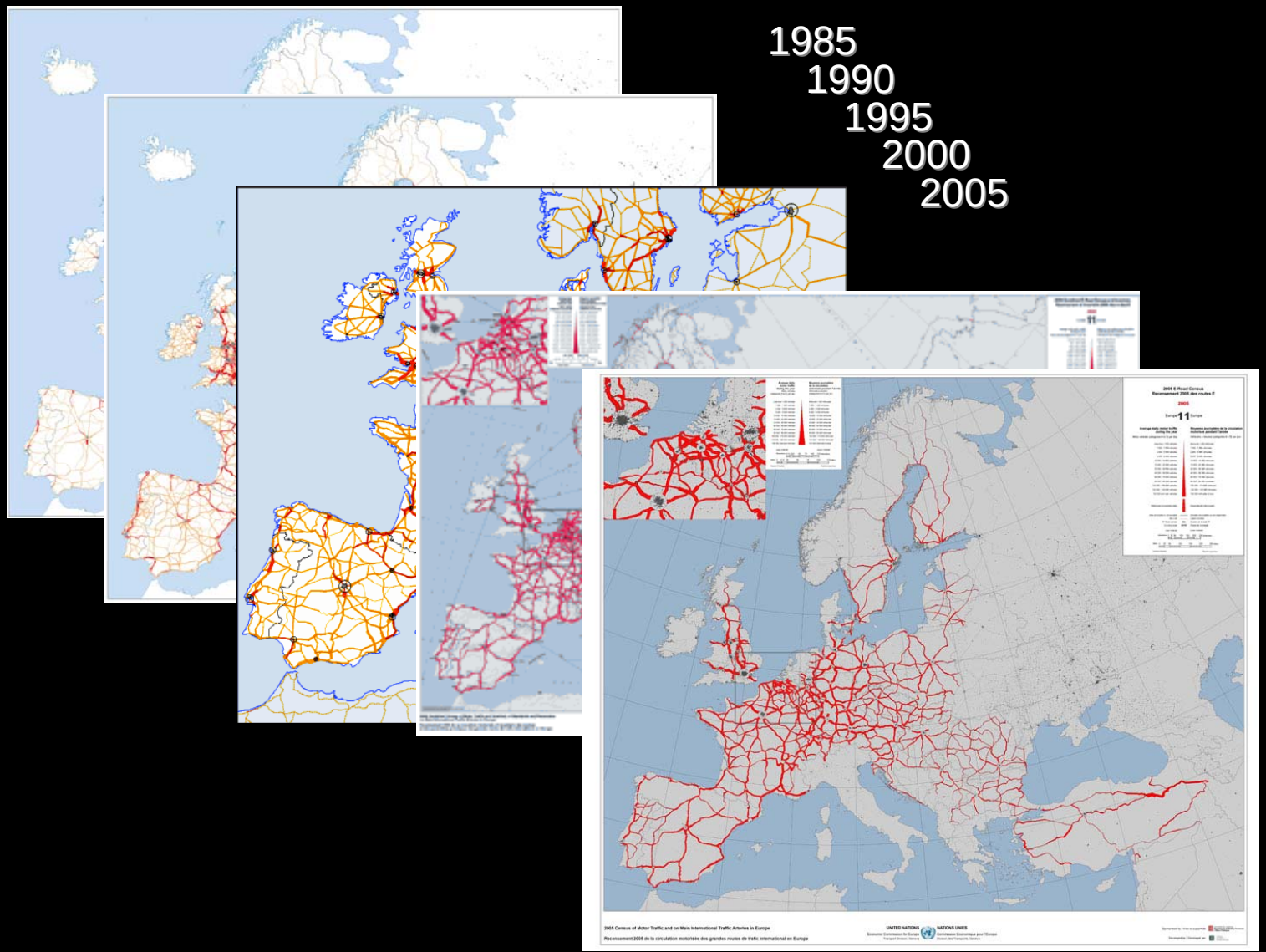
E-Road Network GIS



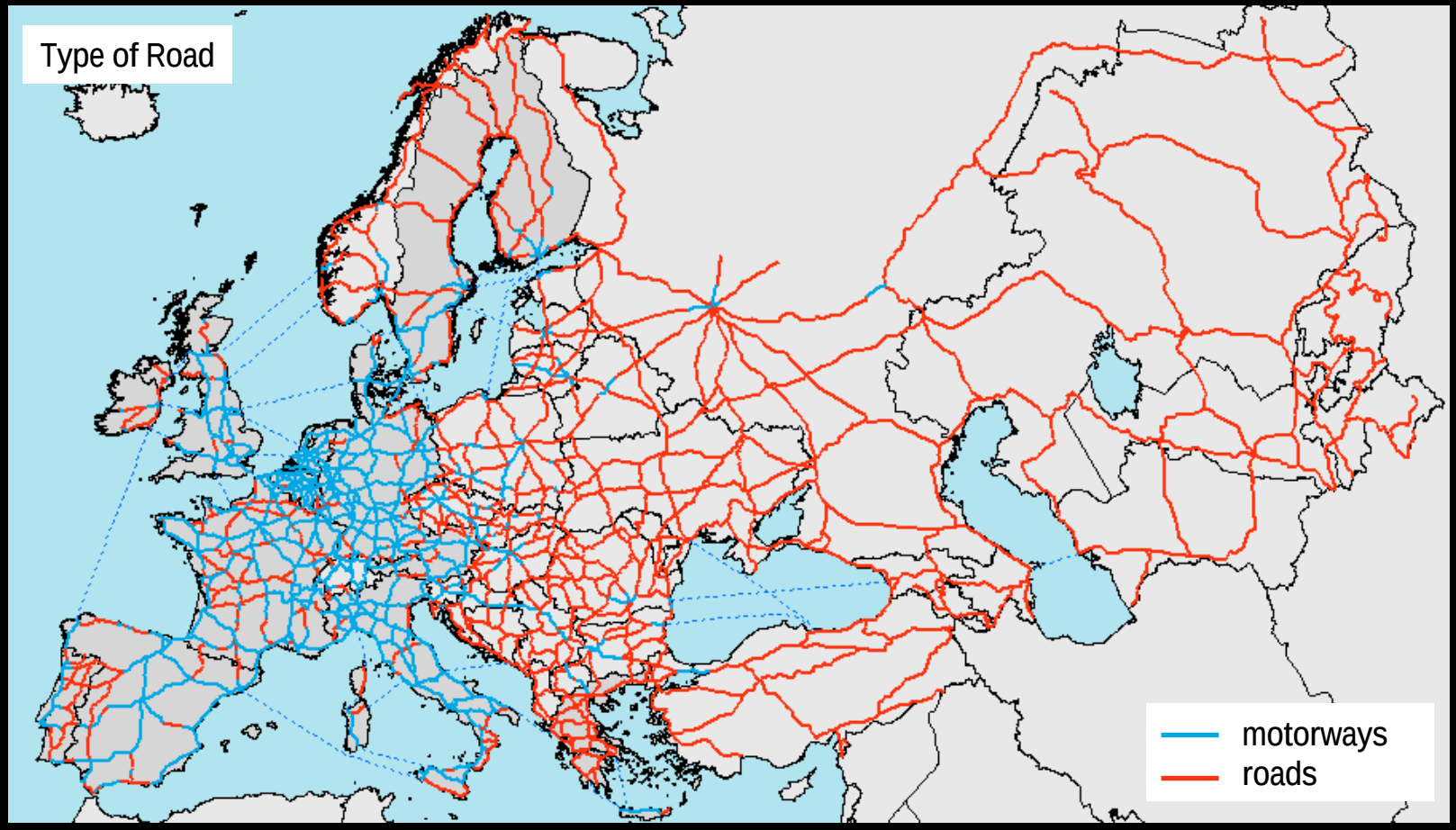
Automation a geographic application for censuses

- Census previous to 1995:
  - Manually input data
  - Maps created using basic CAD software
- Census post to 1995:
  - In GIS all data are digitally geo-referenced
    - Facilitating:
      - The process of updating and harmonization Census data
      - The geographical analysis and display of the different Census data (tables, charts and maps)
    - Allowing:
      - A faster publication of the E-Road Census
      - A more sophisticated presentation of data and maps (improvement of statistical reports and cartographic production)
  - GIS is "incremental"
    - It can always be fed with new geocoded information, thus allowing for newer and deeper analyses
    - For instance, the *2000 Inventory of Main Standards and Parameters of the E-Road Network has been easily integrated into the GIS database developed for the Traffic Census*
    - Variables like design speed or average width of either traffic lanes, central reserves or emergency stopping strips can now be charted and mapped in a very straightforward way

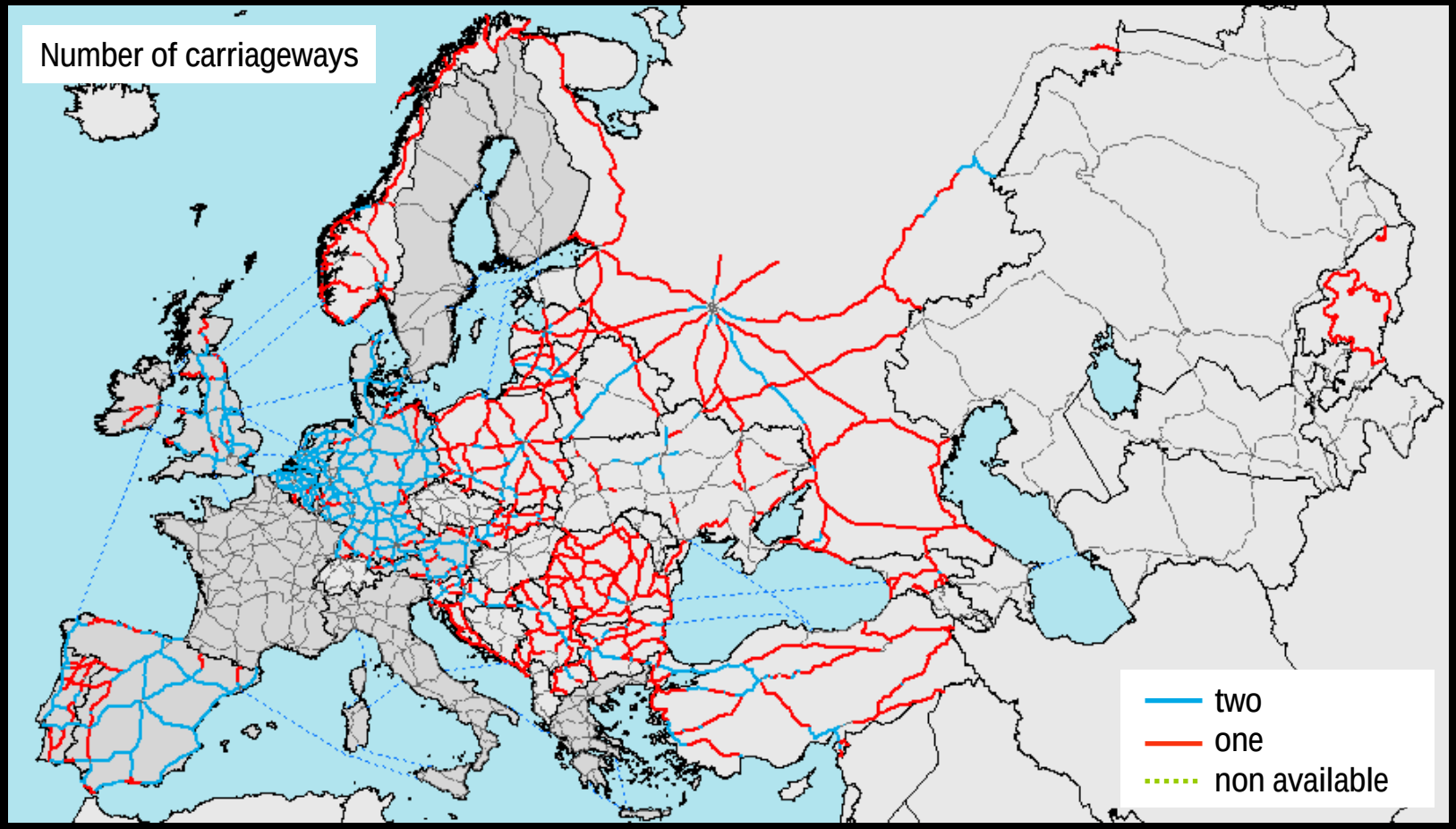
GIS Analysis: Cartographic results



GIS Analysis: Thematic Maps



GIS Analysis: Thematic Maps



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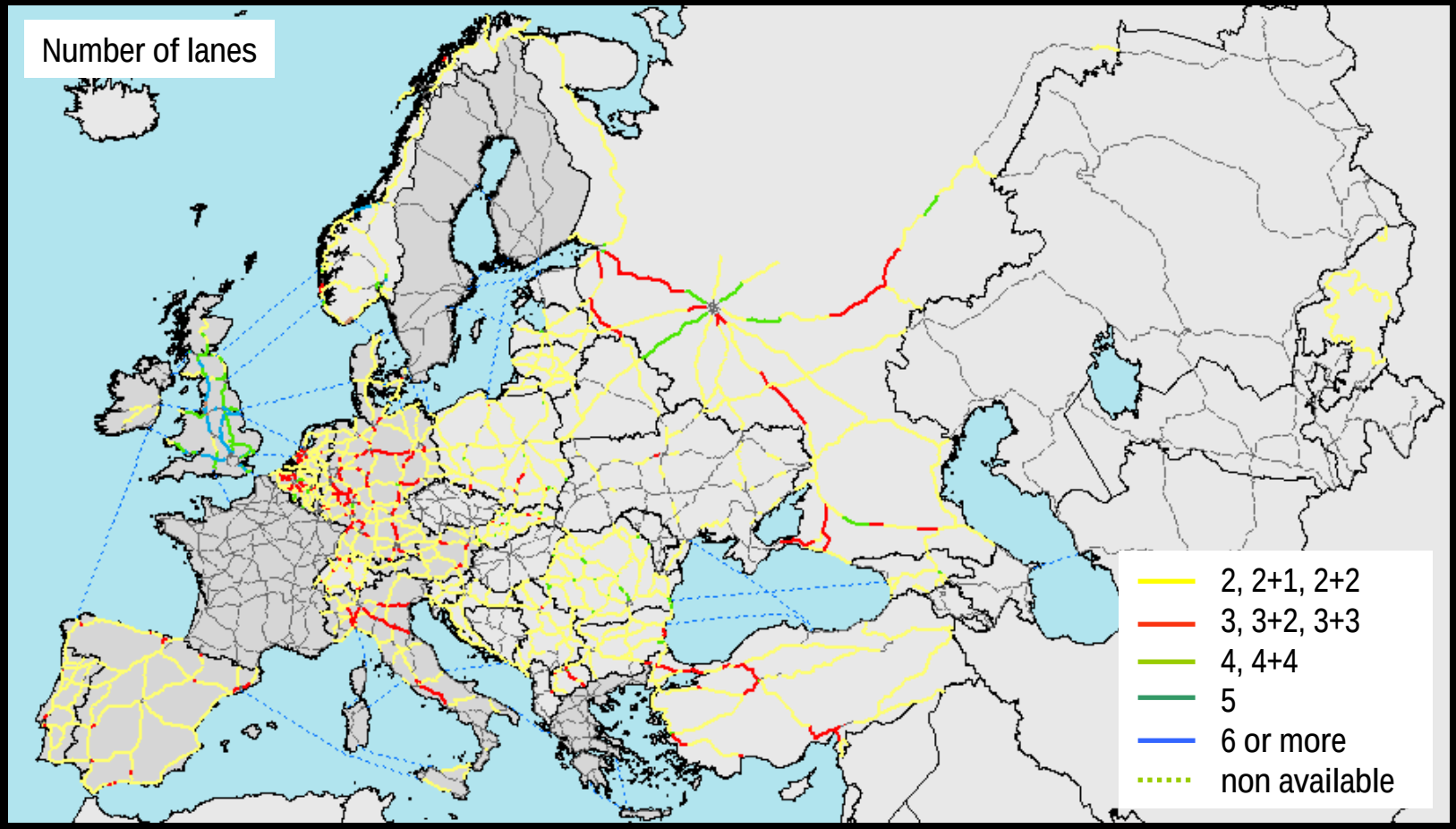

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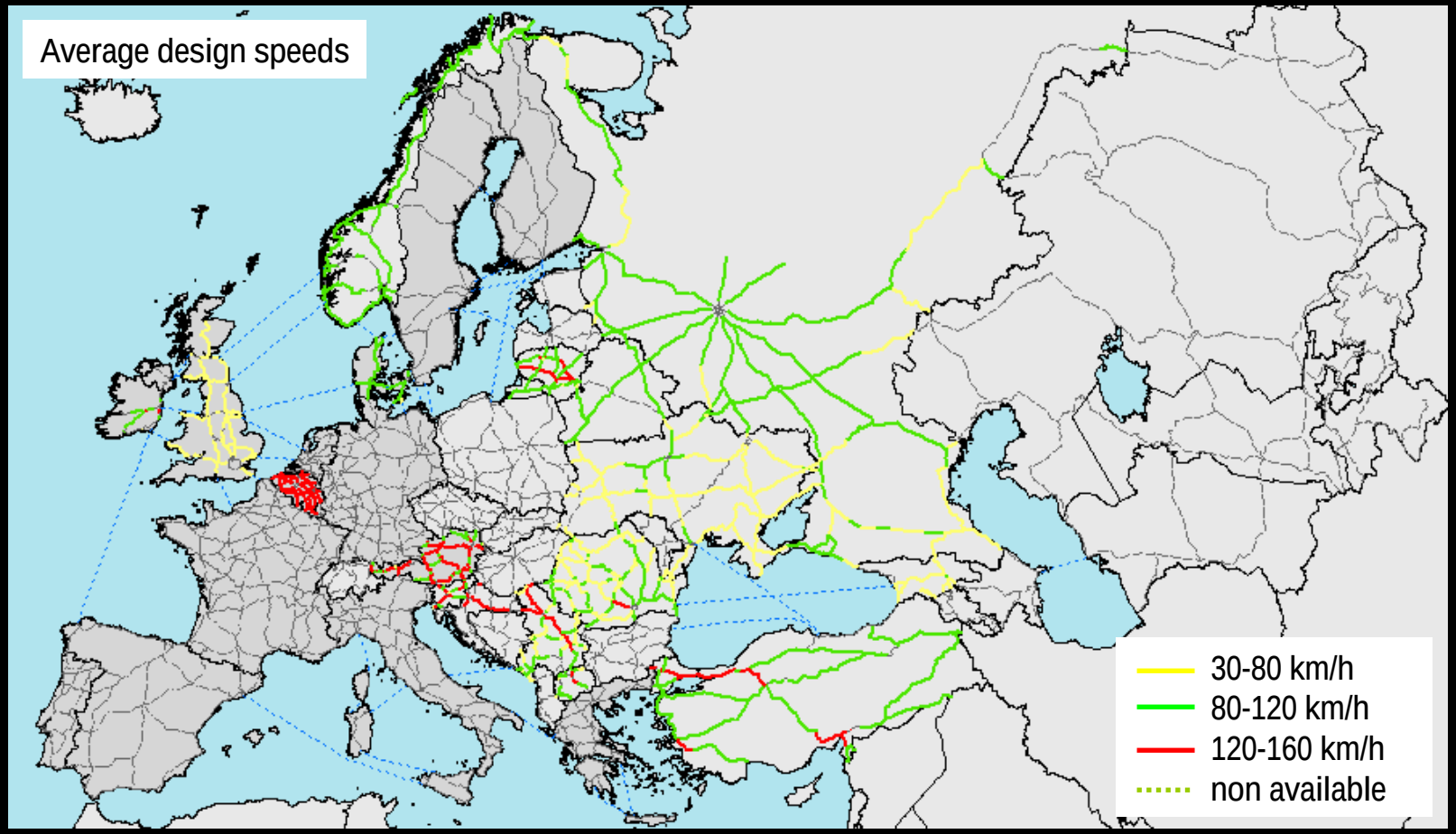

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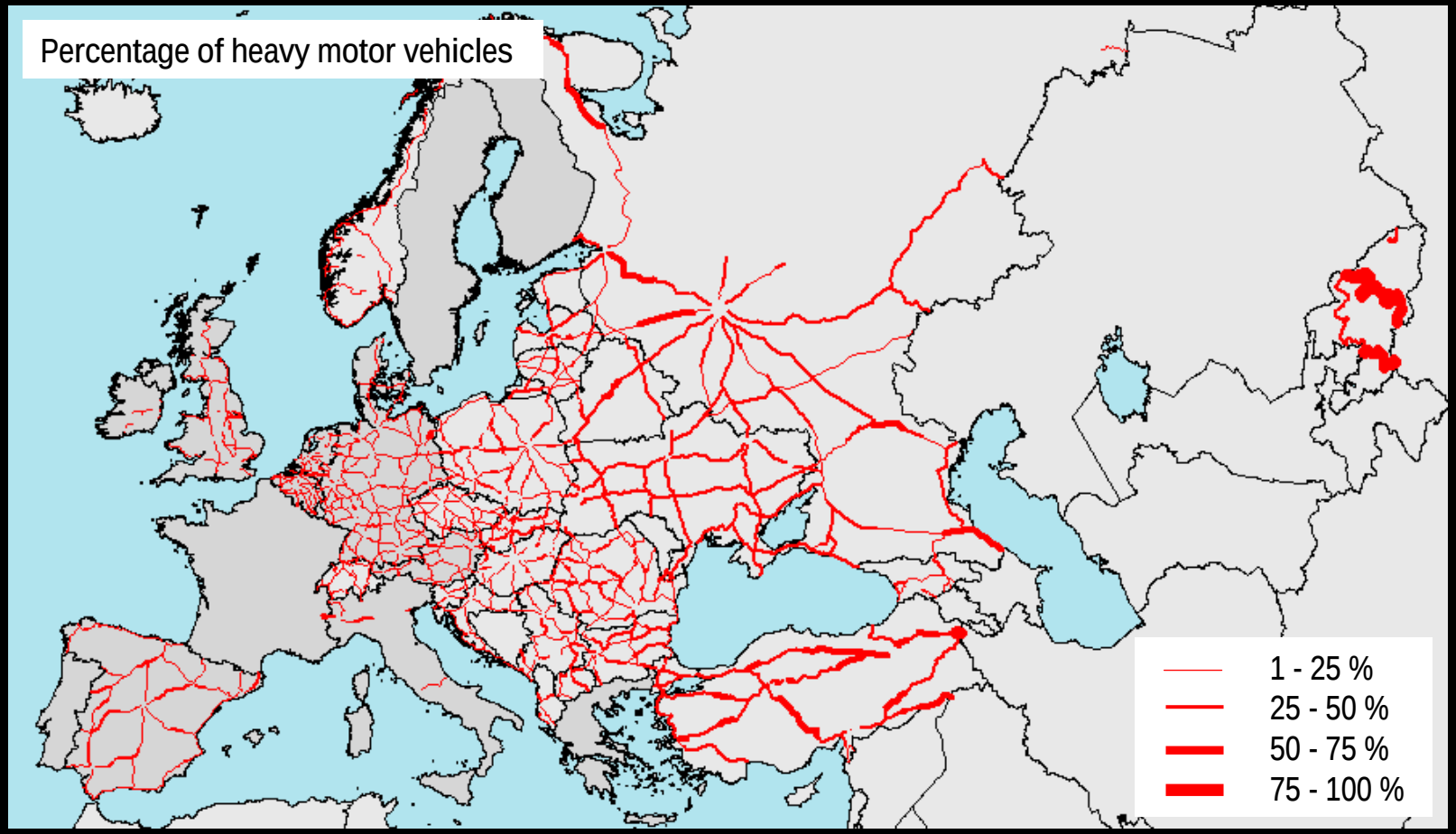

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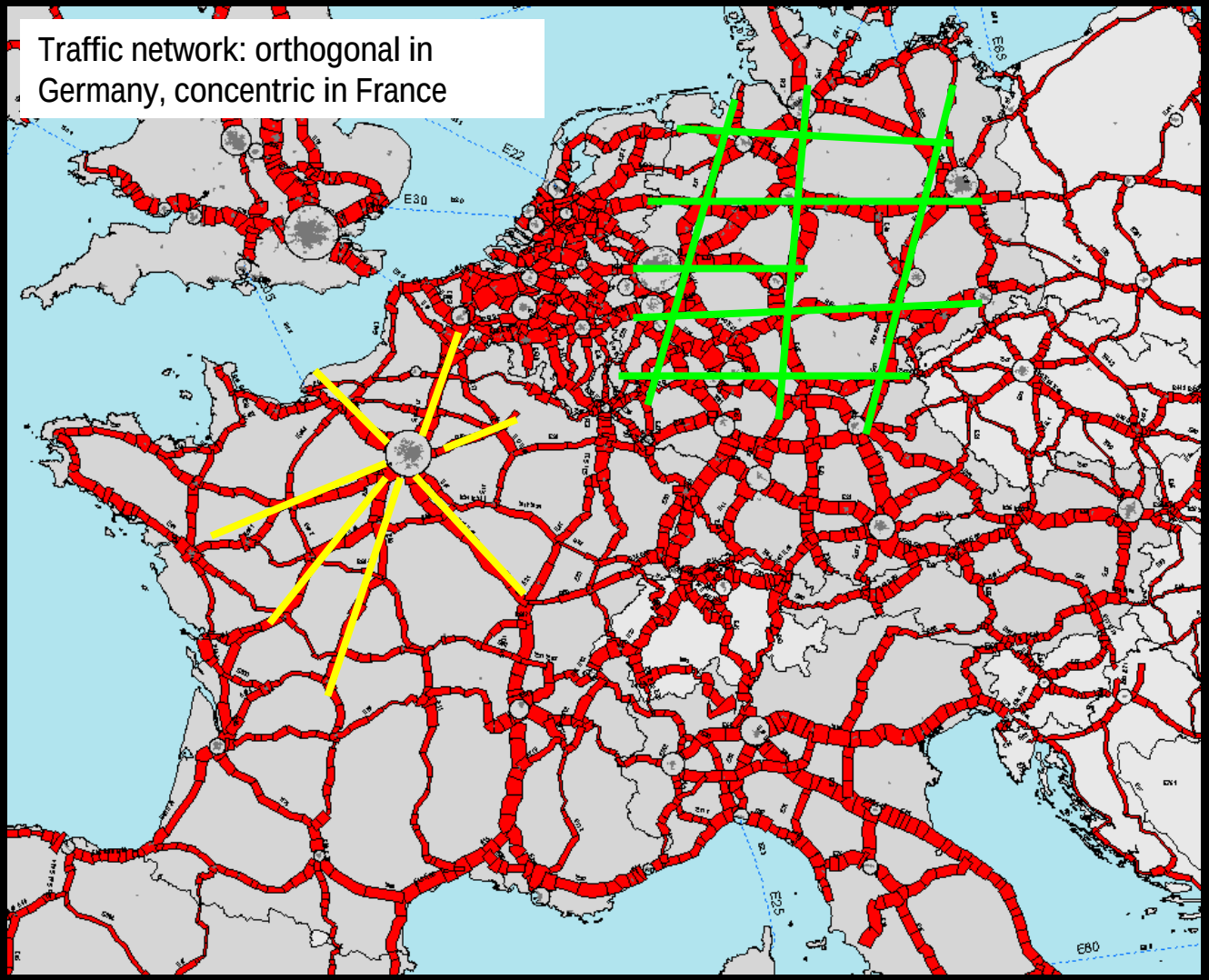

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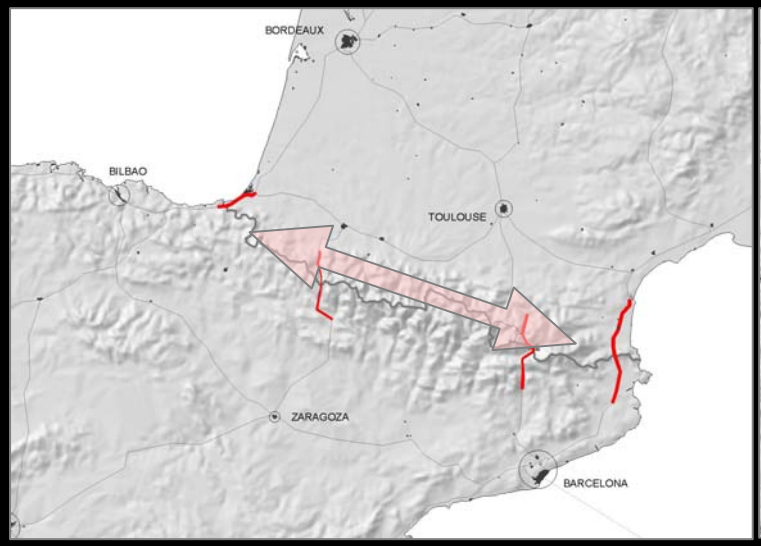
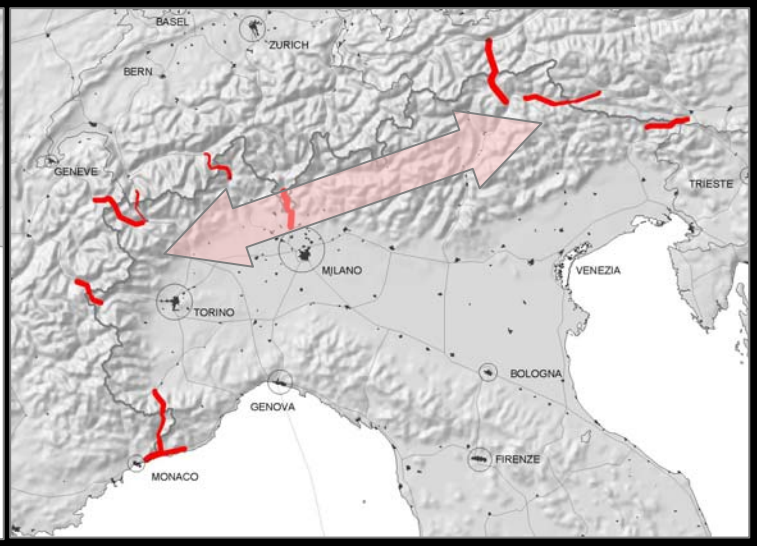
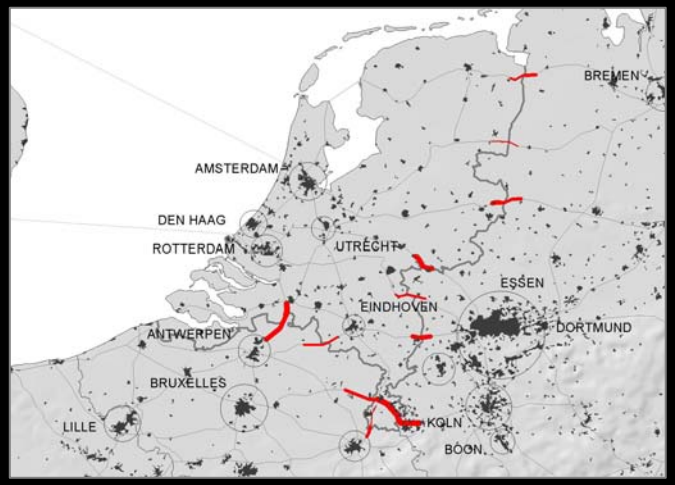
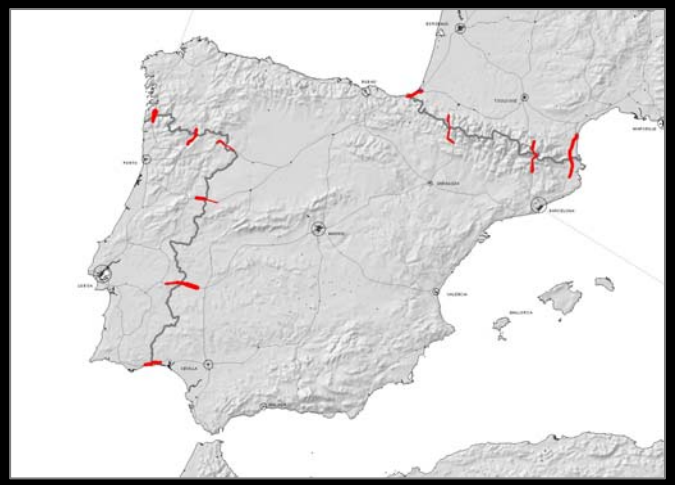




	Pyrenees	Alps	
Length of frontier:	619	1435	km
Year 2000			
Annual average daily motor traffic on frontier border:	12.986	49.742	vehicles/day by year
Daily number of vehicles by year and frontier length:	20,98	34,66	vehicles/day/year/km
Year 1995			
Annual average daily motor traffic on frontier border:	8.616	31.673	vehicles/day by year
Daily number of vehicles by year and frontier length:	13,92	22,07	vehicles/day/year/km
Year 1990			
Annual average daily motor traffic on frontier border:	5.675	19.805	vehicles/day by year
Daily number of vehicles by year and frontier length:	9,17	15,19	vehicles/day/year/km
Year 1985			
Annual average daily motor traffic on frontier border:	3.634	18.656	vehicles/day by year
Daily number of vehicles by year and frontier length:	5,87	13,01	vehicles/day/year/km

GIS Analysis: Thematic Maps



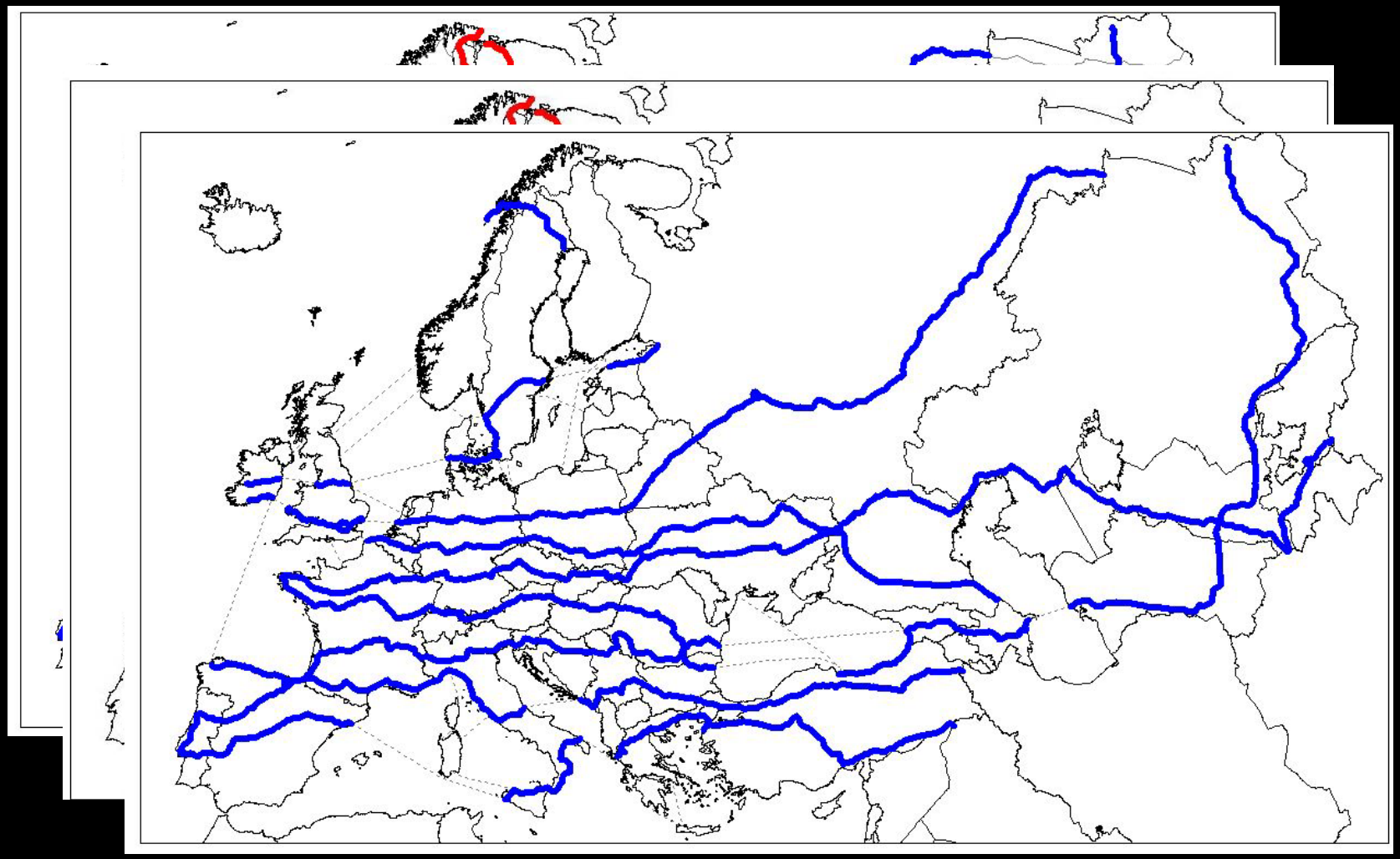


	All Netherlands	All Spain	
Length of frontier:	920	1.758	km
Annual average daily motor traffic on frontier border:	27.621	9.835	vehicles/day by year
Daily number of vehicles by year and frontier length:	60,05	11,19	vehicles/day/year/km

	Netherlands vs. Belgium	Spain vs. France	
Length of frontier:	395	619	km
Annual average daily motor traffic on frontier border:	34.117	12.986	vehicles/day by year
Daily number of vehicles by year and frontier length:	86,45	20,98	vehicles/day/year/km

	Netherlands vs. Germany	Spain vs. Portugal	
Length of frontier:	525	1.139	km
Annual average daily motor traffic on frontier border:	21.095	6.683	vehicles/day by year
Daily number of vehicles by year and frontier length:	40,18	6,04	vehicles/day/year/km

GIS Analysis: Thematic Maps

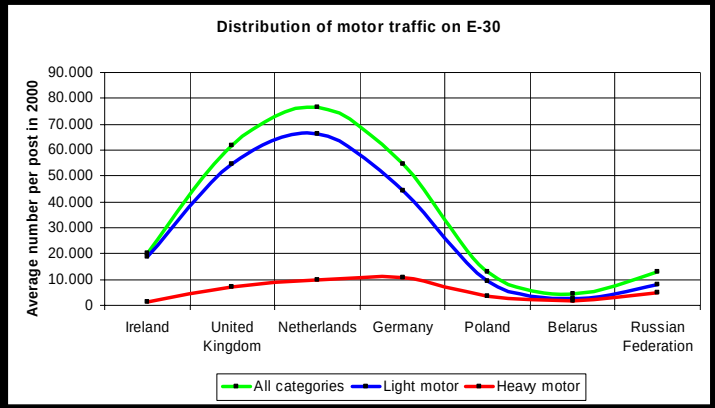


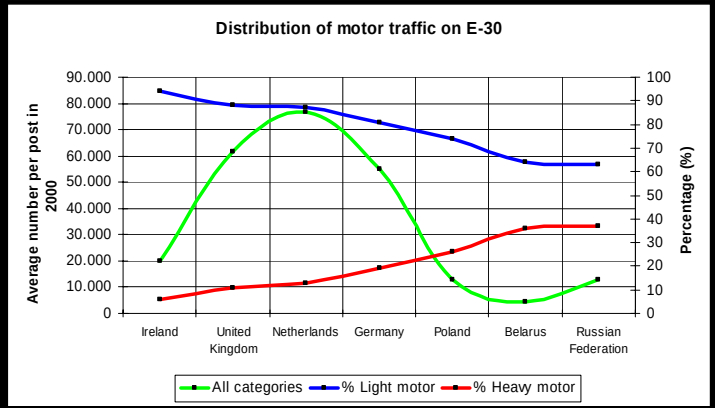
GIS Analysis: Database analysis

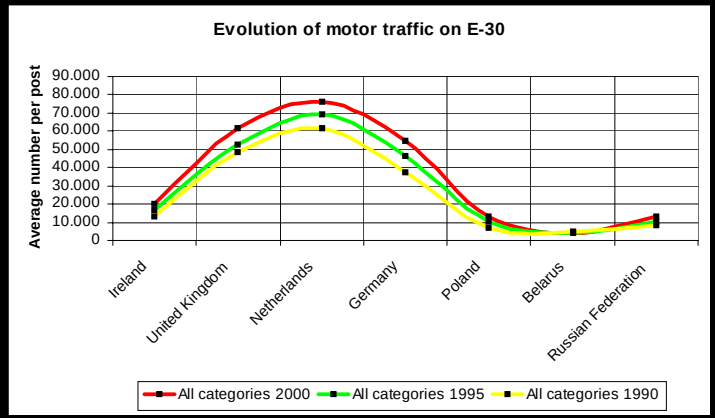
E-Road	Length (km)	Traffic change over 1995 (%)
E30	6303	18,33

Type of road	Length (km)	Traffic change over 1995 (%)
MOTORWAY	1702	19,82
ROAD	4601	16,64

Country	Length (km)
Belarus	597
MOTORWAY	117
ROAD	480
Ireland	161
MOTORWAY	24
ROAD	137
Germany	540
MOTORWAY	540
Netherlands	211
MOTORWAY	202
ROAD	9
Poland	654
MOTORWAY	107
ROAD	547
United Kingdom	654
MOTORWAY	599
ROAD	56
Russian Fed.	3485
MOTORWAY	114
ROAD	3371







Conclusions of the GIS analysis

- Traffic maps reflect the topography and the political and administrative organization of European countries
- Traffic maps are a reference of the population distribution and the levels of economy activity
- Traffic maps are useful to understand a complex reality, the European mobility
- Traffic maps are useful to improve the orientation of transportation plans and projects
- Traffic maps are useful to give an objective basis to define priorities and assign European budgets to them

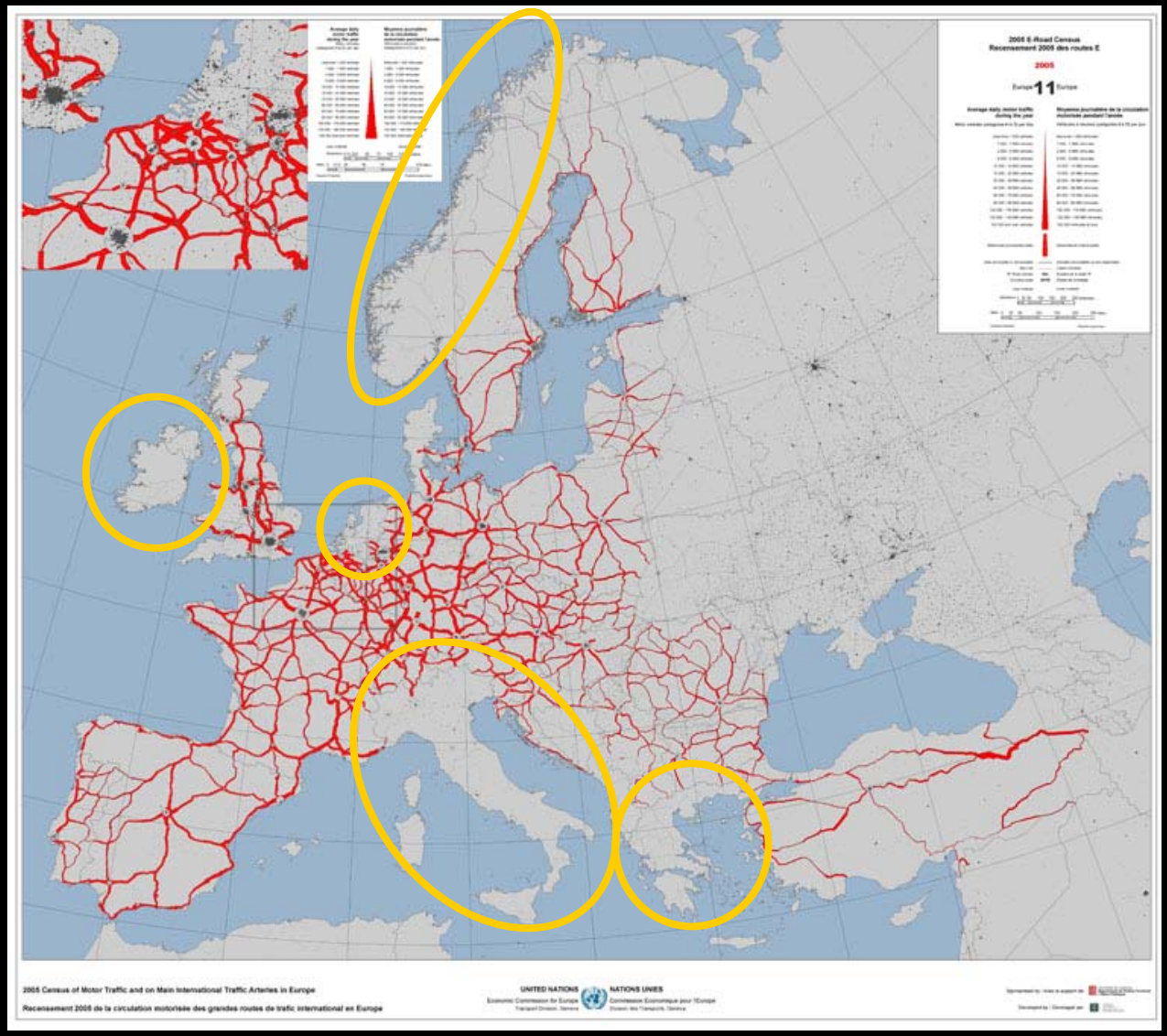
Conclusions of the UN/ECE specifications

Benefits	Inconvenient	Proposed solutions
• The initiation of GIS capabilities at the PC level within UN/ECE by using GIS software in order to visualize and study all the information contained in the GIS	• Managing a very heterogeneous volume of information due to the huge number of information sources	• Homogenize the formats of data delivery using a single system of file management
• The project allowed the electronic dissemination of graphic and alphanumerical data (CD Rom & Map viewer)	• Information requests are sent to UN/ECE in an excessively long time interval. This, means not being able to upgrade the network within the planned time frame	• Establish strict parameters in the delivery of information by countries to the United Nations
• It is also forecasted to incorporate the GIS produced items on the Census, such as maps, statistical databases and reports into the UN/ECE's web on the Internet	• Do not fill all the fields of the database does not help to improve the system	• Fill all the fields of the database that UN/ECE request

Suggestions to 2010 E-Road Census 2010

- … establish a real commitment with all UN/ECE's members
- … obtain homogeneous data
- … in an appropriated time period

PRODUCE A REAL MOTOR TRAFFIC MAP, WITHOUT GAPS

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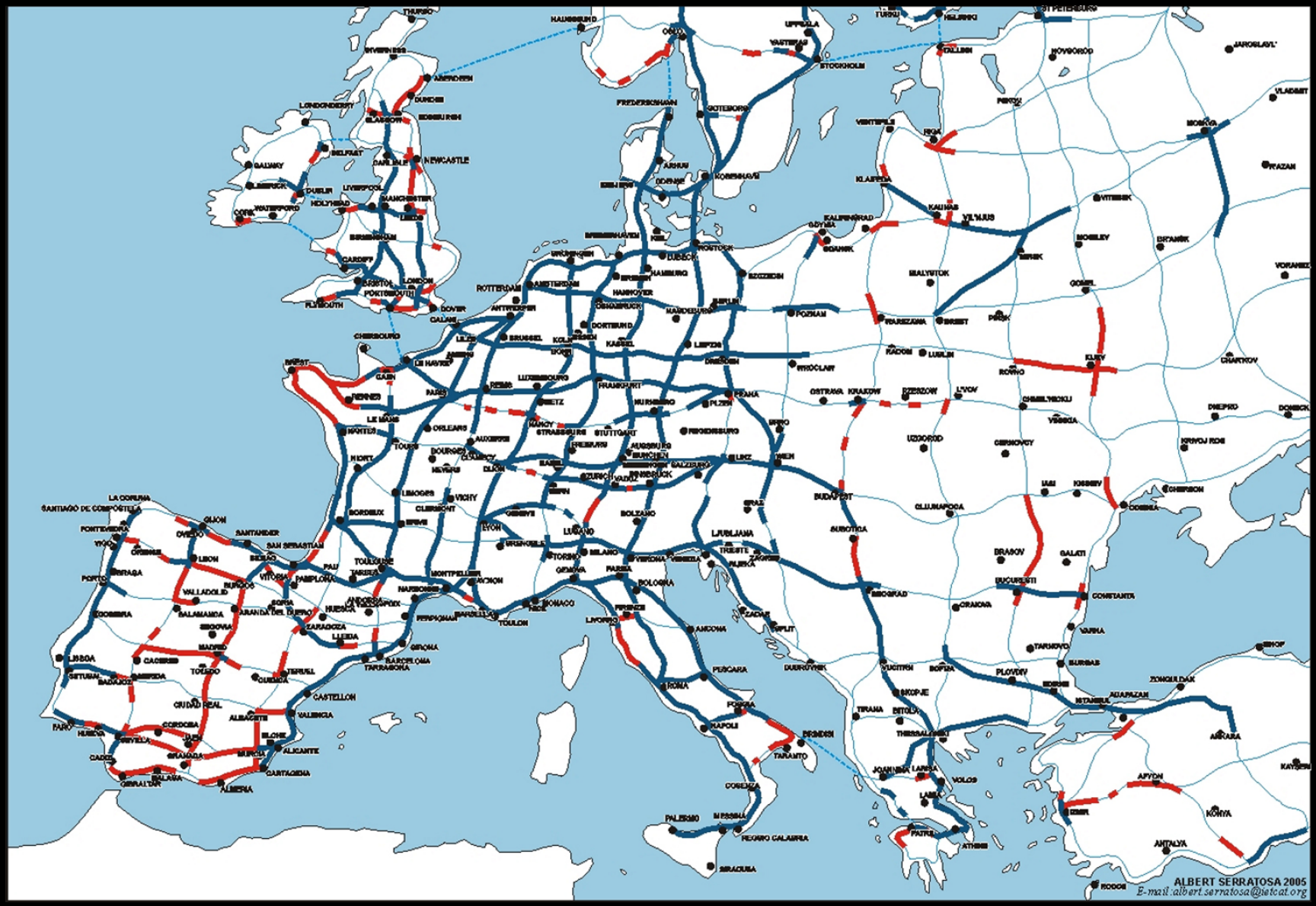
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Thanks for your attention !!

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