

Natural and technological hazards

- Fields of research and analysis (sample)
 - Natural hazards
 - Floods
 - Landslides/avalanches
 - Forest fires
 - Extreme precipitation
 - Extreme temperatures
 - Technological hazards
 - Nuclear power plants
 - Production plants of hazardous goods
 - Hazardous waste deposits
- Not all fields can be elaborated due to lack or unaccessibility of data

Natural and technological hazards

- Development of indicators – the case of the flood events

Natural and technological hazards	Driving forces Indicators of influence factors on hazards and damage potentials	Pressure Indicators of hazards and damage potentials	State Indicators of spatial risk / spatial security	Impact Indicators of disaster	Response Indicators of disaster response / risk management (indicators of prevention, mitigation, preparedness, response, recovery)
Floods	<ul style="list-style-type: none"> • Growth of population and GDP in areas that have been flooded • Increase of factors that influence floods (e.g. settlement extension, climate change) 	<ul style="list-style-type: none"> • Areas that have been flooded • Population density/GDP (in areas that potentially can be flooded) 	<ul style="list-style-type: none"> • Combined indicator of Population density/GDP and flooded areas according to flood frequency since 1985 	<ul style="list-style-type: none"> • Clasification of flooded areas according to flood frequency since 1985 	<ul style="list-style-type: none"> • E.g. Building restrictions (retention areas) / safety measures in flooded areas

Natural and technological hazards

- Dimensions of vulnerability
 - Economic
 - Social
 - Ecological

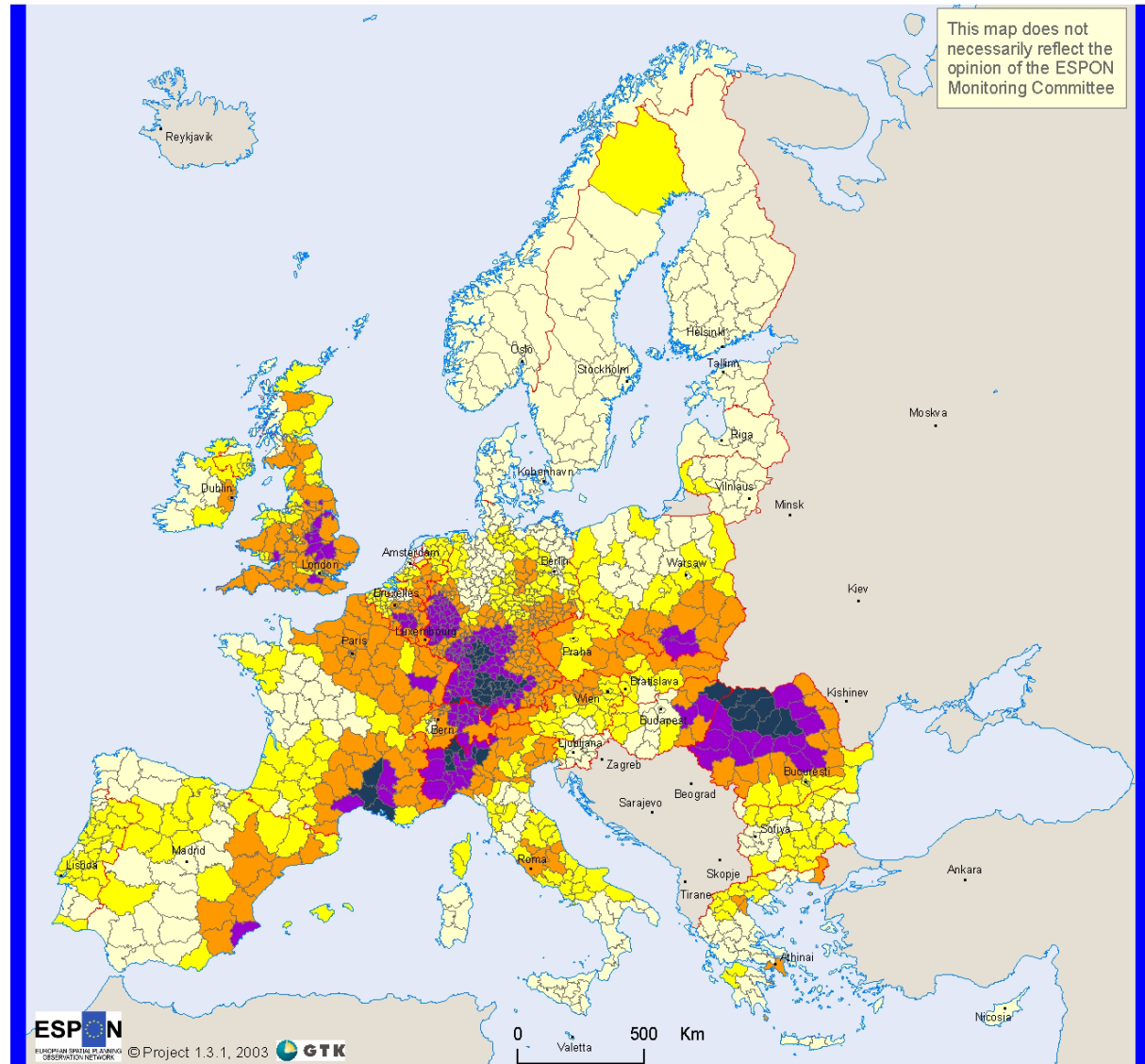
- Indicators for measuring the damage potential
 - Population density
 - GDP per capita
 - Dependency ratio
 - Education rate

Large river flood hazard in Europe (NUTS 3)

Natural and technological hazards

Large river flood hazards in Europe (NUTS 3)

Luxembourg: Moderate flood hazard intensity

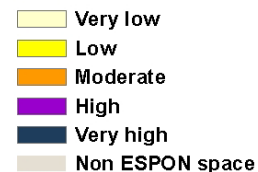


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GTK

Origin of the data: ©EuroGeographics Association for the administrative boundaries
Large flood areas © Dartmouth Flood Observatory
Flood areas ©ESA - Earth observation- Earth online

Source: ESPON Data Base

Flood hazard intensity



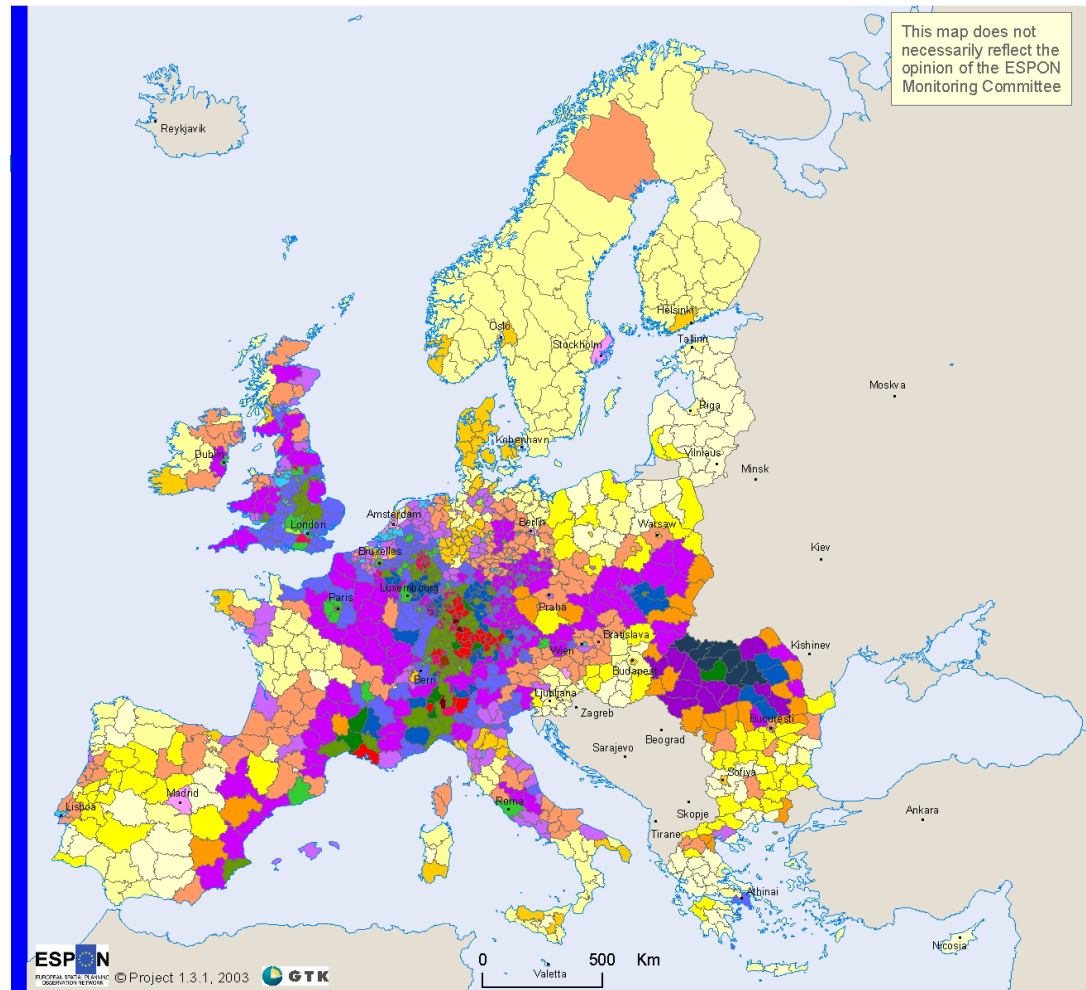
This map shows the hazard intensity based on average number of large flood events on NUTS 3 level during 1987-2002. Each NUTS3 region has been given an average of the large flood event that fall inside it. To the first class "Very low hazard intensity" only the regions without large flood events are included.

Large river flood risk in Europe 1987-2002 (NUTS 3)

Natural and technological hazards

Flood risk in Europe (NUTS 3)

Luxembourg: Relatively high flood risk, belonging to category 7.



Origin of the data: ©EuroGeographics Association for the administrative boundaries
 Large flood areas ©Dartmouth Flood Observatory
 Flood areas ©ESA - Earth observation- Earth online

Typology of the regions

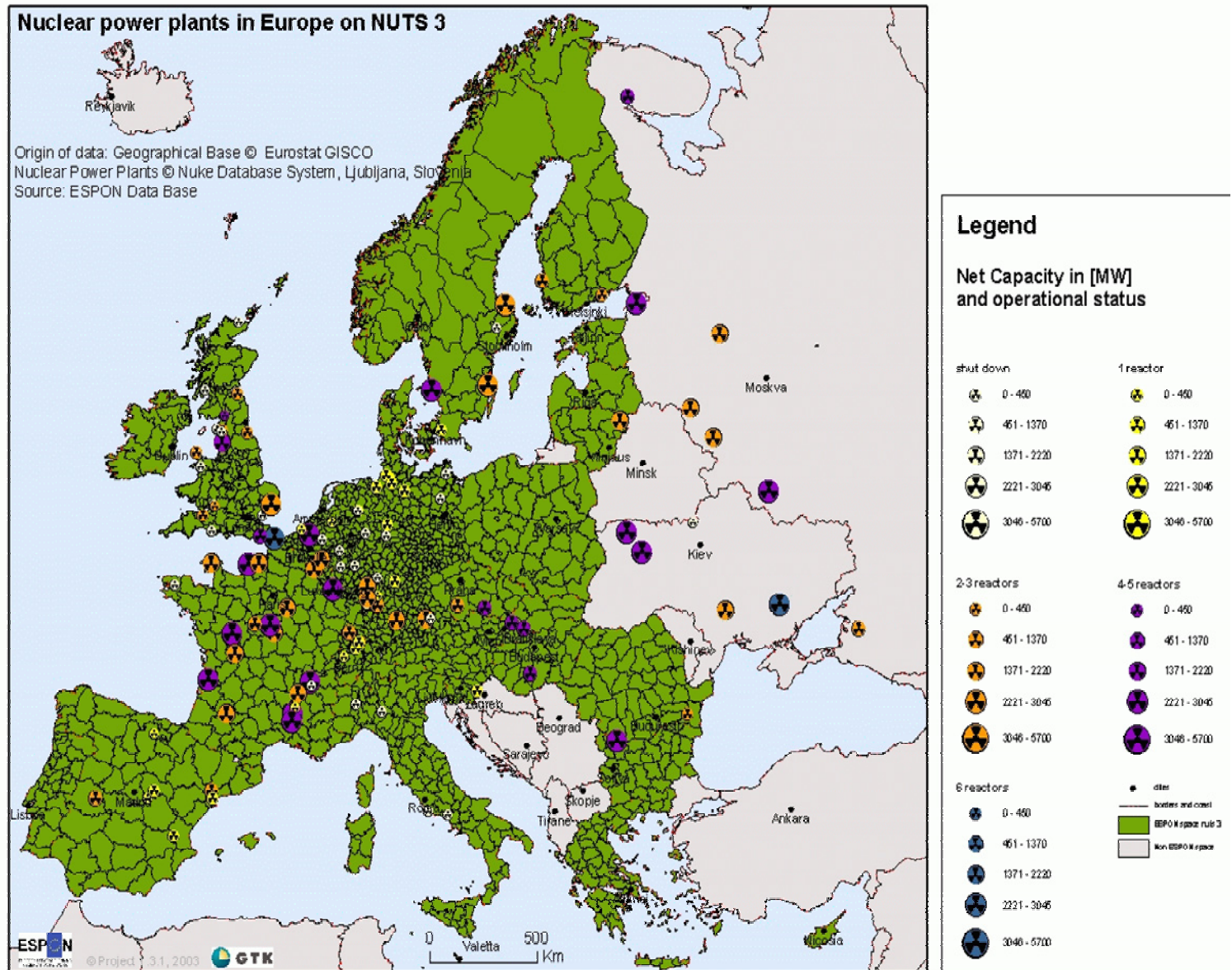
Source: ESPON Data Base

Legend of risk maps	Degree of vulnerability				
	1	2	3	4	5
Intensity of river floods	1	2	3	4	5
1	2	3	4	5	6
2	3	4	5	6	7
3	4	5	6	7	8
4	5	6	7	8	9
5	6	7	8	9	10

Natural and technological hazards

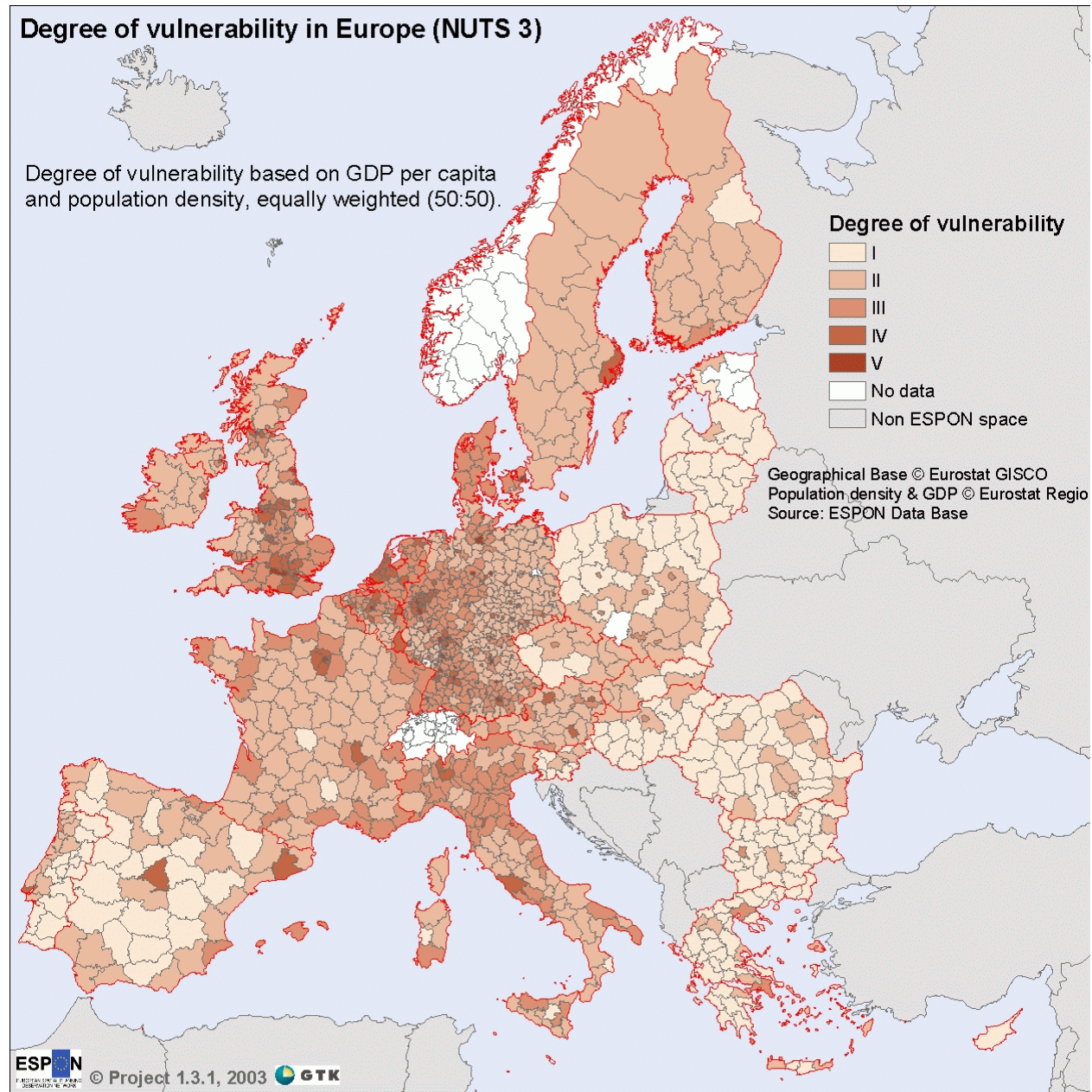
Nuclear power plants in Europe (NUTS 3)

Luxembourg: 4-5 reactors



Natural and technological hazards

Luxembourg: relatively high degree of vulnerability, belonging to category IV.



Natural and technological hazards

- Outcome of the project:
Risk mitigation planning guide (sample)
 - To minimize the impacts of hazards effects
 - To review the hazards of the respective area (region, municipality)
 - To establish goals and objectives
 - To review possible approaches to reduce risk
 - To provide a background document (on the regional level) for local action

Natural and technological hazards

- Policy recommendations (EU level)
 - Better inclusion of risks related to natural and technological hazards in EU policies.
 - More emphasis on prevention and vulnerability reduction through spatial planning.
 - Deliberate use of Structural Funds for risk management
 - Establish a European Emergency Management Agency (EEMA) for coordinating European risk management efforts.

Natural and technological hazards

- Policy recommendations (national, INTERREG)
 - Implementation of the Strategic Environmental Assessment directive (2001/42/EC) should be ensured by member states.
 - Creation of governance networks to address risk management in regions with special environmental characteristics and related challenges.
 - Improve integration and co-operation between spatial planning experts and civil protection authorities.
 - Transnational INTERREG areas with common ecological denominators should be used as 'breeding and testing' grounds for meso-level risk management programmes.

Natural and technological hazards

- Policy recommendations (regional level)
 - Adopt and implement regional mitigation plans, allowing for “subsidiarity”.
 - Adopt measures in the new Thematic Strategy on the Urban Environment.
 - Enhance horizontal co-operation between regions and urban areas (e.g. through networks such as Interreg initiatives, EUROCITIES, URBACT etc.) in the fields risk management and civil protection.
 - Enhance public awareness of hazards and public participation in risk reduction efforts.

Natural and technological hazards

- Policy recommendations (local, municipal level)
 - Adopt local mitigation plans based on the best available knowledge on hazards.
 - Accept and enforce the mitigation plan as a guideline for all other municipal activities with a relation to hazard exposure and vulnerability.

ESPON Workshop

ESPON Project 1.3.2

Natural heritage

- Central question: What is the influence of the management of natural heritage on spatial development?
 - Diagnosis of the principal territorial trends of natural heritage at EU scale
 - Cartographic picture of spatial and historic trends
 - Development of territorial indicators
- Methodology: DPSIR model = Driving Forces, Pressures, States, Impacts, Responses
 - Fields of research: agriculture, socio economic and territorial development, infrastructure

Natural heritage

- Findings in D&P: Agriculture – Nature
 - MACRO:
 - EU policy stimulated land take for intensive use; decreased semi-natural area and biodiversity;
 - CAP reform stimulates rural development: turn of process;
 - MESO:
 - National agr. policy strongly dependent from EU policy
 - MICRO:
 - International and national agr. policy affect local/regional natural heritage.

Natural heritage

- Findings in D&P: Socio economic and territorial development – Nature
 - MACRO:
 - No European spatial planning, except first attempt of ESDP.
 - MESO:
 - Few coherent national plans.
 - MICRO:
 - Concentrated in local and regional initiatives.

Natural heritage

- Findings in D&P: Infrastructure – Nature
 - MACRO:
 - Wide spread accessibility as prerequisite for economic development resulting in ongoing fragmentation.
 - MESO:
 - Facilities for mobility follow urbanisation and enhance further suburbanisation, causing pressure on valuable landscapes.
 - MICRO:
 - Main infrastructure causes fragmentation of semi-natural areas.
 - Improved accessibility at the cost of natural values.

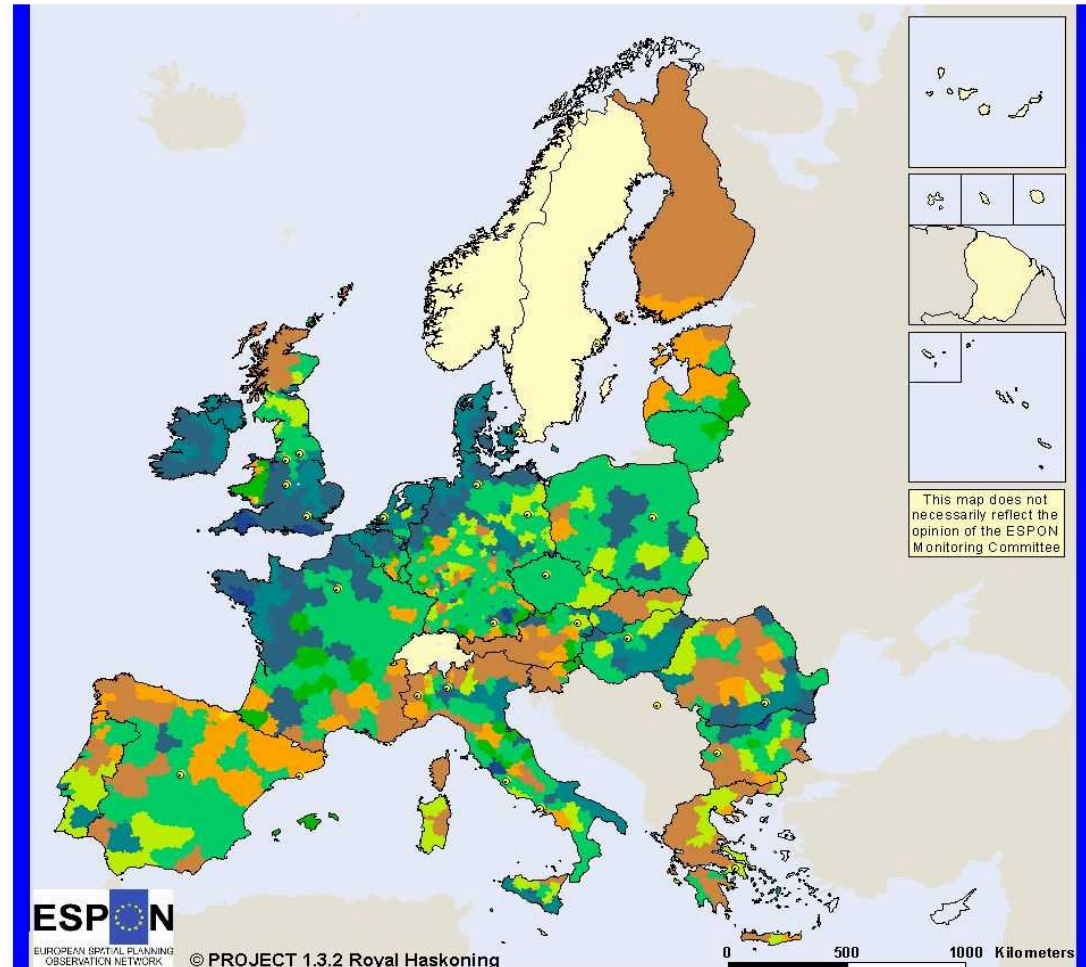
Natural heritage

- Findings in States:
 - Natural heritage consists of remains of nature.
- Findings in Impacts:
 - During ages a constant decrease of species has taken place.
 - The natural heritage is very fragmented.

Natural heritage

Fragmentation index for NUTS 3

Luxembourg:
20 – 50% of natural area is fragmented.



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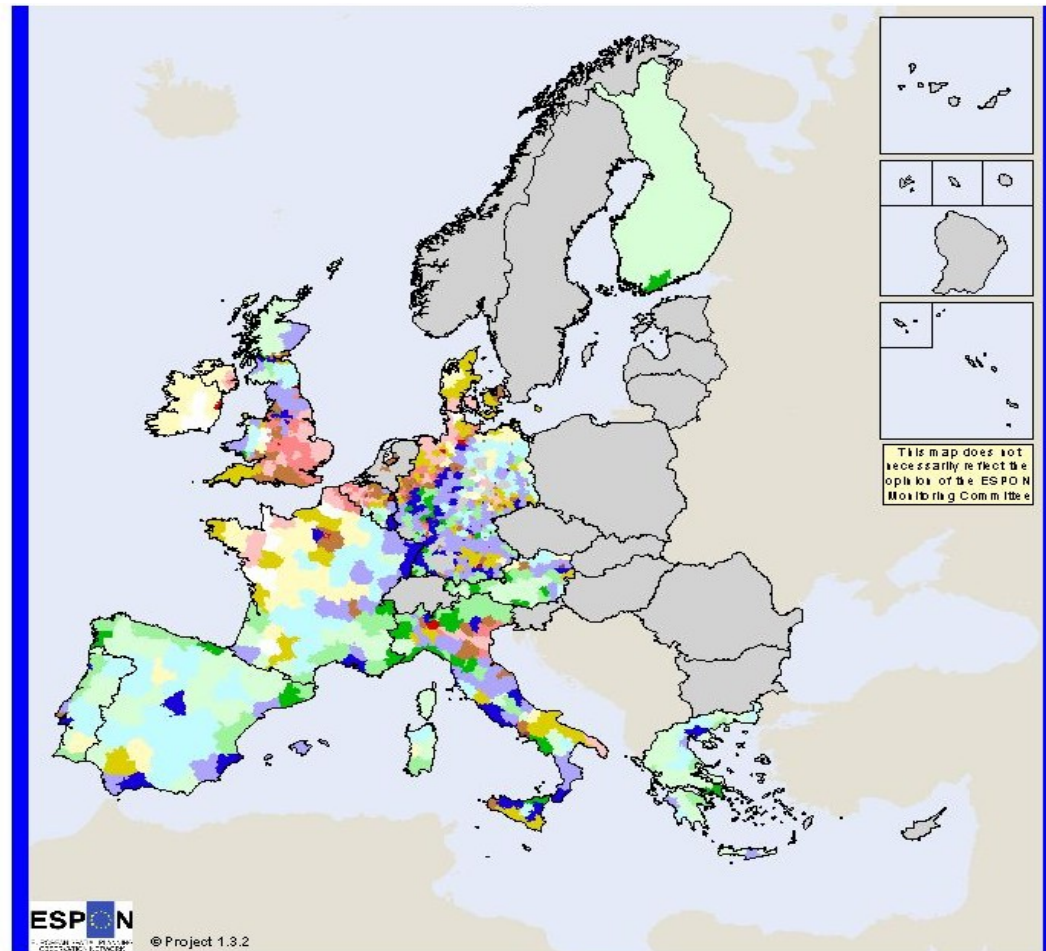
- Main cities
- Fragmentation
- > 50 % natural area and < 10 patches / 10km²
- > 50 % natural area and 10 - 30 patches / 10km²
- > 50 % natural area and >30 10 patches / 10km²
- 20 - 50 % natural area and < 10 patches / 10km²
- 20 - 50 % natural area and 10 - 30 patches / 10km²
- 20 - 50 % natural area and >30 10 patches / 10km²
- < 20 % natural area and < 10 patches / 10km²
- < 20 % natural area and 10 - 30 patches / 10km²
- < 20 % natural area and >30 10 patches / 10km²
- No data

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Sources: IUCN, Eurostat, ESPON Data Base, EEA

Natural heritage

Percentage semi-natural area compared to urban pressure

Luxembourg:
High urban pressure on relatively high % of natural area cover mainly consisting of agricultural areas and forests.



		% Natural area			
		0-10 %	10-25 %	25-50 %	> 50 %
Urban pressure	low	11	21	31	41
	medium	12	22	32	42
	high	13	23	33	43
	very high	14	24	34	44
		no data			

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Origin of data: EEA, Eurostat, IUCN
Source: ESPON Database

Natural heritage

- Findings in Policy responses
 - MACRO:
 - Environmental legislation;
 - Birds/Habitat directive, Natura 2000, ESDP;
 - MESO:
 - Few integral national spatial plans;
 - Growing acknowledgement of importance of integrated plans;
 - MICRO:
 - Growing need for integrated regional strategic co-ordination.

Natural heritage

- Policy recommendations (sample):
 - Balanced development in corridors
 - Polycentric development in nodes
 - Selective accessibility
 - Priority to old industrial areas
 - International co-ordination
 - Regional development vision
 - Natural values as an asset
 - Etc.

Natural heritage

- Further research issues
 - Complete dataset for trend analyses.
 - Completion and further improvement of used indicators.
 - Identification of potential conflict areas, urban development – ecological network.
 - Nature as an asset for attracting economic activities.

ESPON Workshop

ESPON Project 1.2.2

Telecommunication Services and Networks

- Main task:
 - Uncover, draw together and analyse the data on the supply of and demand for telecommunications.
 - Focus of the study is on the *infrastructure* of the information society.

Telecommunication Services and Networks

- Methodology:
 - Collecting and analysing quantitative data which was or could be made comparable at various territorial levels.
 - Main data source: study of the household penetration of telecommunications in EU15 at the sub-national level.
 - Reanalysis of the data using socio-economic-geographic categories in order to try and better understand the factors behind differential patterns of telecoms penetration (EU15): Comparison of the uptake levels of regions for telecommunication with
 - their developmental status (Objective 1 and non-Objective 1),
 - their level of GDP,
 - their population density and
 - their degree of urbanisation, and core-periphery location (Pentagon vs non-Pentagon).

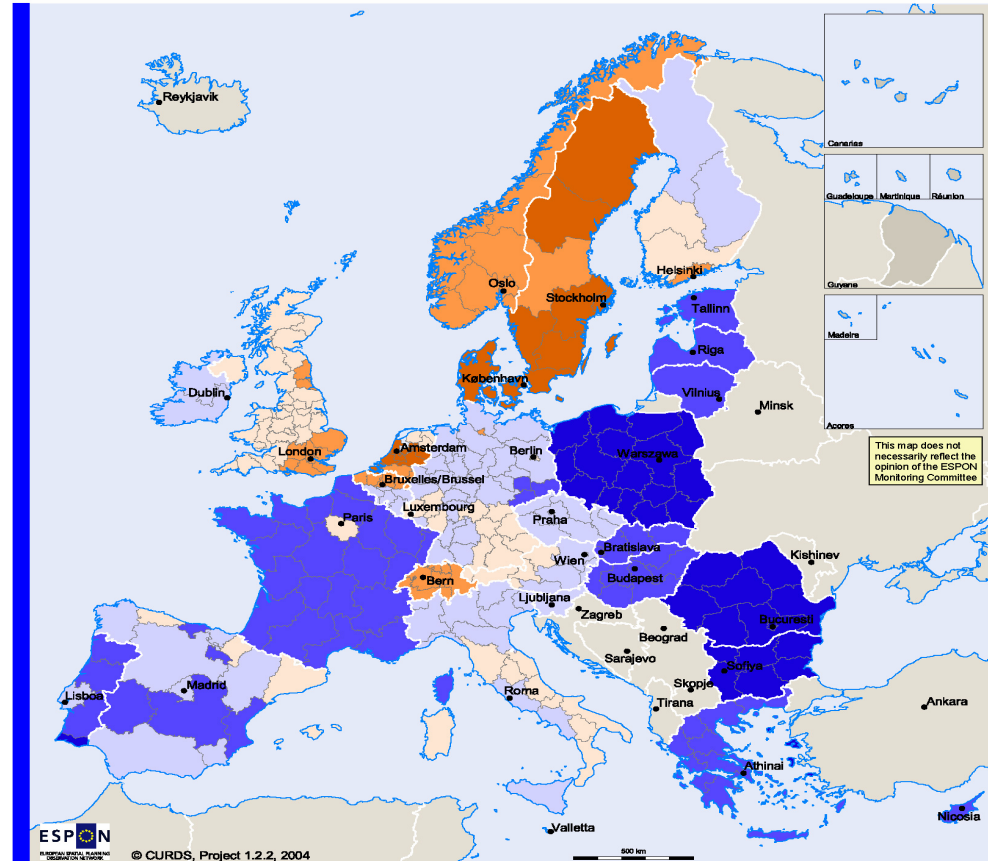
Telecommunication Services and Networks

- Results at macro level:
 - North-south divide (strength of the Nordic countries which lead the way in the uptake of almost all technologies)
 - West-east divide
 - The European 'core-periphery' distinction (which is apparent across many socio-economic indicators) does not hold for telecommunications.
 - Strength of the 'Nordic periphery',
 - In mobile telephony, the 'Mediterranean' periphery outpaces the 'core'
 - Core only leads in access to Internet backbone networks for large corporate users and Internet Service Providers.

Telecommunication Services and Networks

Luxembourg:
The level of
telecommunications
development is
moderately high.

Typology of levels of households telecommunications uptake



Level of telecommunications development

- very high
- high
- moderately high
- moderate
- low
- very low
- no data

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Origin of data: CURDS

Source: ESPON Database

Telecommunication Services and Networks

- Results for Luxembourg:
 - Very high penetration rates for
 - fixed (land) lines
 - cell phones
 - number of PCs
 - internet connections
 - broadband availability
 - Luxembourg is the only central European country with such high rates.

Telecommunication Services and Networks

- Results for Luxembourg:
 - High broadband availability but low broadband usage (BE and NL show high broadband uptake)

*Table 5.11: LUXEMBOURG: Extent of 'spread' of regional differences in telecommunications uptake**

	Category 1 (high)	Category 2	Category 3	Category 4	Category 5	Category 6 (low)
Fixed line						
Mobile						
PC						
Internet						
Broadband						

*Luxembourg is national level at NUTS 2

Source: CURDS; based on data drawn from INRA (2004)

Telecommunication Services and Networks

- Policy Issues (*focus on infrastructure*):

Table 6.1: Outline of national government supply-side strategies to increase coverage of broadband in under-served areas through infrastructure investment in EU15

<i>Country</i>	<i>Specific supply-side strategy? Yes (✓) No (X)</i>	<i>Nature of supply-side intervention strategy for under-served areas</i>	<i>Examples of funding and implementation mechanisms</i>
Luxembourg	✓	Government is looking at ways of extending connectivity to 6-8% of households which do not have possibility of connecting to broadband	Exploring satellite and UMTS. Use of SF possible

ESPON Workshop

ESPON Project 1.2.1

Transport Trends

- Three main questions:
 - How may the transport network constitute a key factor of a more balanced, more polycentric, more sustainable spatial development?
 - How to develop the accessibility to basic services and to knowledge in order to increase the territorial cohesion?
 - What will be the consequences of enlargement on the preceding objectives?

- Methodology :
 - combination of state-of-the-art and newly developed methodologies

Transport Trends

- General results:
 - transport is facilitating social and economic relations
 - transport is generating environmental externalities that reduce and constrain the capability of a given region to attract new activities, as well as to some extent the productivity of the already existing activities
 - accessibility: the classical centre-periphery scheme could not be denied
 - the areas presenting a good accessibility seem to be those which suffer the most from transport externalities

Transport Trends

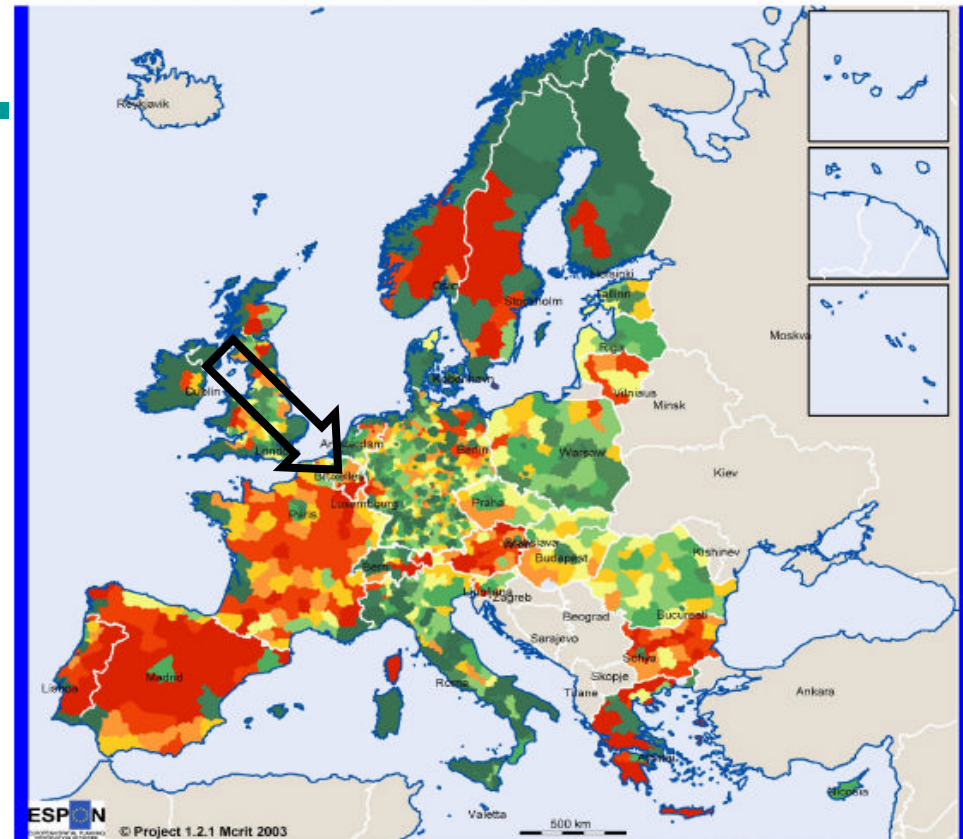
- Results for Luxembourg:
 - Luxembourg is one of the most accessible regions of Europe, regarding multimodal accessibility it belongs to the above average accessible regions.
 - While motorway density is one of the highest, railway density is of medium value.
 - Luxembourg is situated at one of the main corridors for freight traffic both on road and on rail, but it has no maritime outlet.

Transport Trends

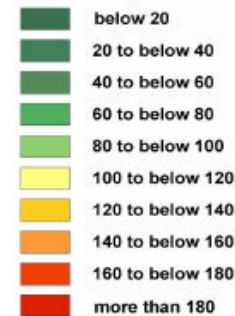
Density of motorways and expressways by population

Luxembourg: shows sufficient motorway and expressway network infrastructure according to its inhabitants.

Density of motorways and expressways by population



km of network 2001/population 1999 (ESPON Space=100)



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Origin of data: ASSEMBLING graph
GISCO

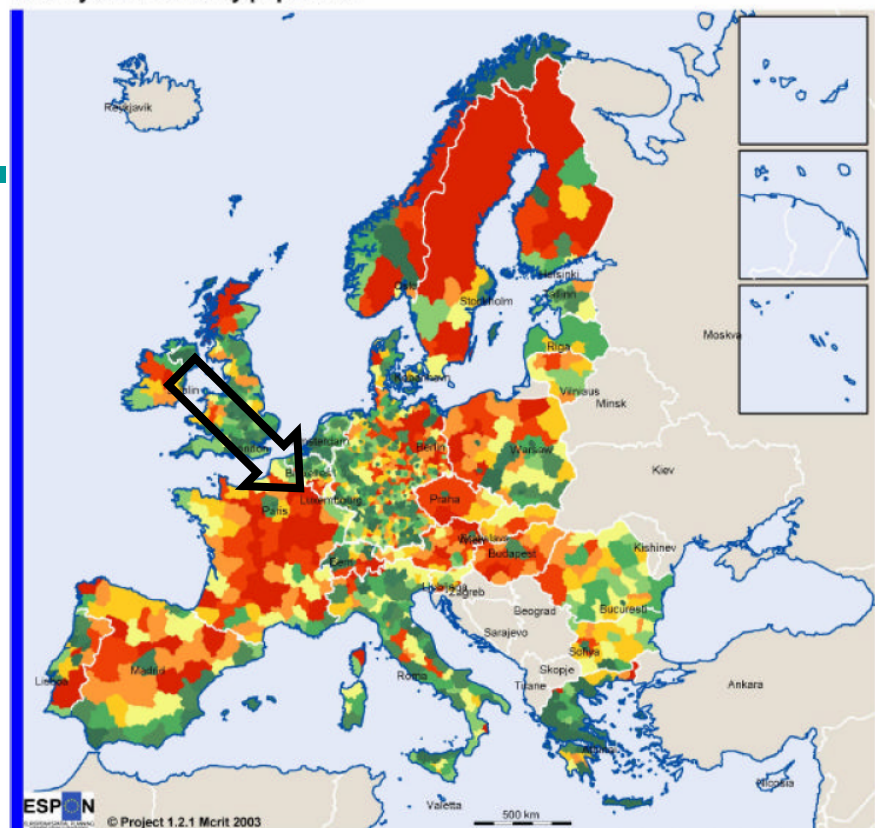
Source: ESPON Data Base

Transport Trends

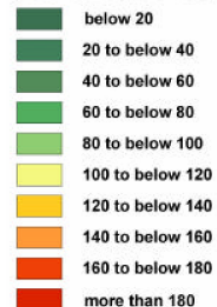
Rail density

Luxembourg:
The density of rail lines by population is of medium value.

Density of rail lines by population



km of network 2001/population 1999
(ESPON Space=100)



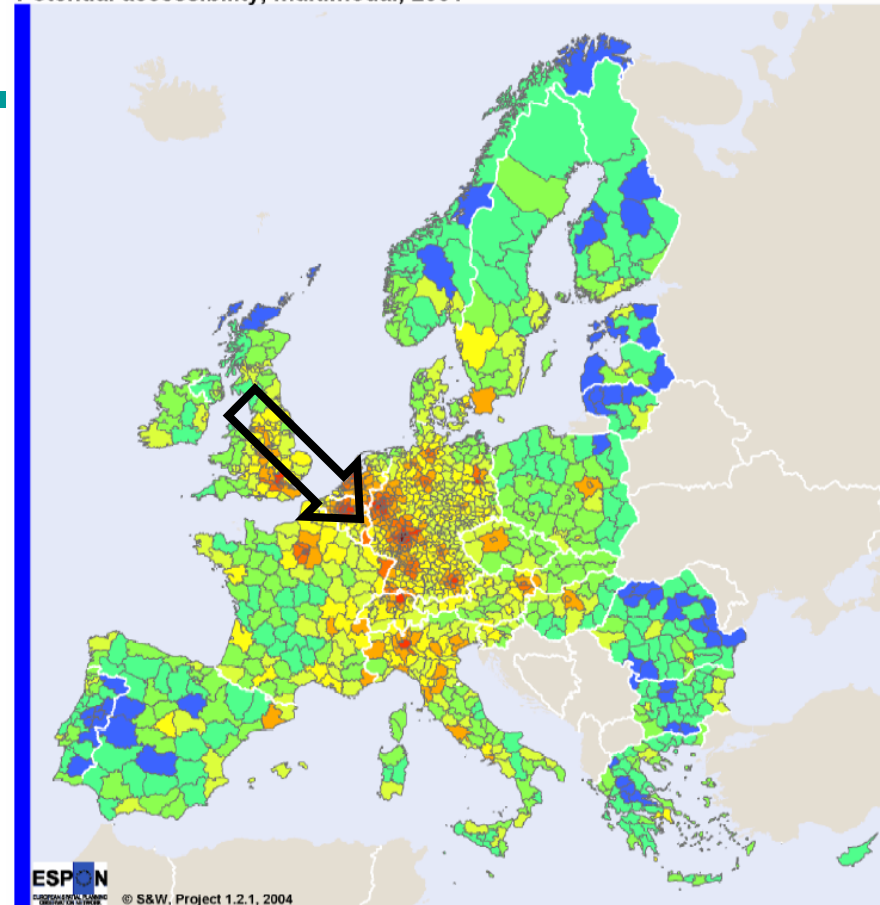
Origin of data: ASSEMBLING graph GISCO

Transport Trends

Potential accessibility, multimodal

Luxembourg belongs to the regions with clearly above average accessibility.

Potential accessibility, multimodal, 2001



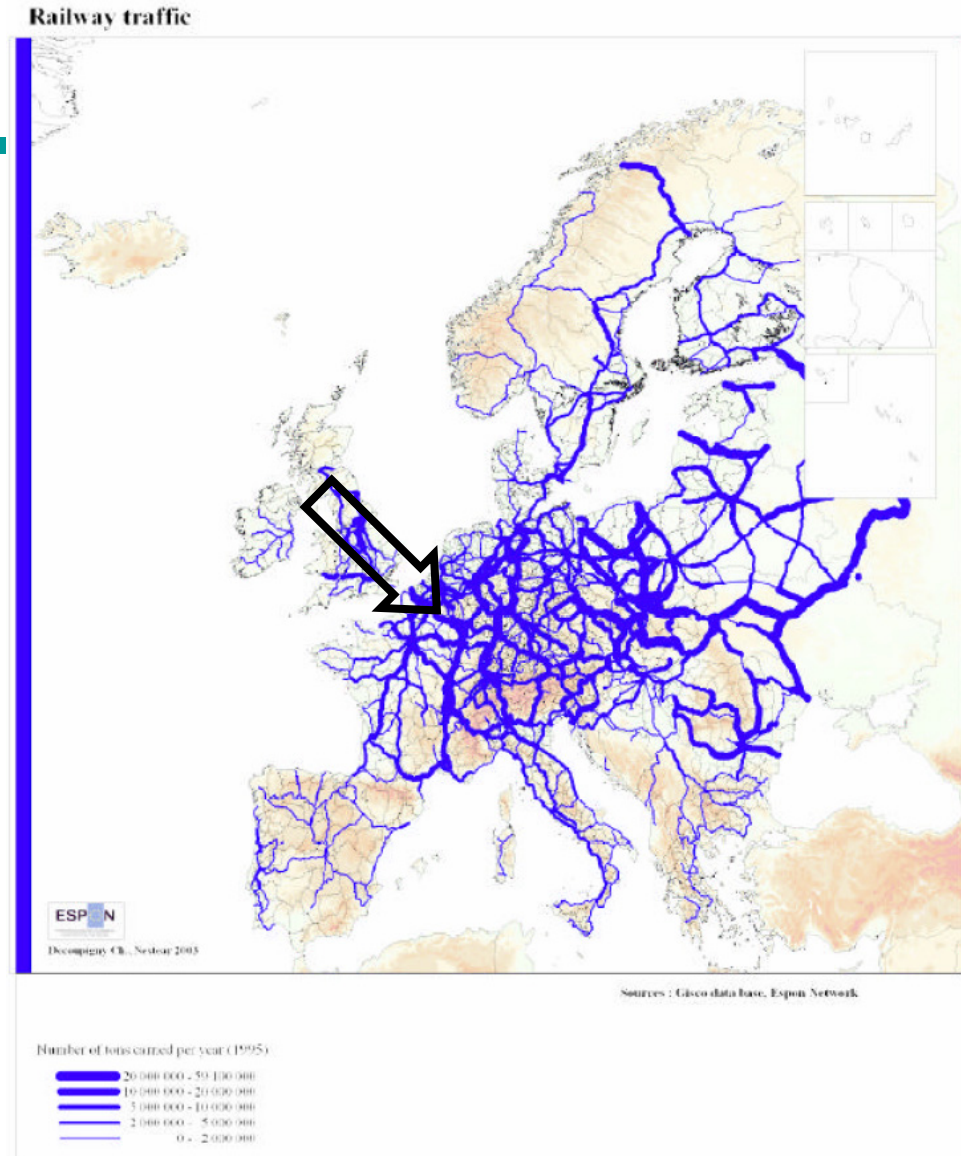
Accessibility (ESPON Space = 100)



Transport Trends

Freight traffic

Luxembourg is situated at one of the main corridors for freight traffic both on road and on rail.



Transport Trends

- Policy recommendations
 - **correction of imbalances**
 - develop short and medium-term policies to adapt the system to transport and infrastructure demand
 - reduce emissions
 - increase of intermodality to facilitate a modal shift
 - speed limit on roads
 - transformation of classical railways into freight-dedicated lines

Transport Trends

- Policy recommendations for macro-regions:

Central Area / The Pentagon

- ***Enable modal shift***

The central area is suffering from road transport to a very high degree.

- ***Enable European integration***

The central area is an important territory in the ongoing EU enlargement and integration process.

Transport Trends

- Comment:
 - The Integrative Transport and Development Concept (Integratives Verkehrs- und Entwicklungskonzept – IVL, 2004) of Luxembourg is one of the current national planning documents regarding transport, infrastructure and trends.
 - Some of the aspects mentioned by project 1.2.1 concerning Luxembourg are already included in the concept.