ACCESSIBILITY OF SERVICES OF GENERAL INTEREST AT REGIONAL SCALE[1] [2]

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Abstract: The presented paper was prepared, based on the analysis conducted within the ESPON SeGI project and it uses the case study selection made for the project as well as the selection of SeGI for the analysis derived from the research conducted for ESPON. The aim of the paper is two-fold. Firstly, it proposes and test the methodology of the analysis of accessibility to services of general interests. Secondly, the application of the proposed methodology is implemented in order to show the differences in accessibility to public services of general interest between and within five case studies: Eastern Austria in Austria, Ruhrgebiet in Germany, Dél-Alföld in Hungary, Mazowsze in Poland and Navarre in Spain. A selection of services of general interest was made in the manner that allows fulfilling the representative criteria according to the centrality of services (low, medium and high) and taking into account also the spatial data availability. For conducted analysis GEOSTAT 2006 population grid dataset were used, showing the population distribution within one square kilometre cells. The travel origins were located in a centroid of all populated grid cells. The calculation of multiple shortest paths was made using specialised GIS software designed for transportation analysis. These allow attributing to all grid cells the time needed for reaching the nearest location of service provider. Based on received results eight sets of thematic maps (one for a one type of service) were produced, adapting 5-minute ranges, staring from zero (where services location were identical to the centroid of populated cell) with the last category comprising travel times highest than 90 minutes. All sets of maps were supplemented by cumulative graph of population that reside within successive time to the nearest service and basic statistics describing results of accessibility analysis.

The results are that accessibility to services of general interest varies between analysed regions when concerning motorways, airports and hospitals. For railway stations, pharmacies and all types of schools all regions are more or less similarly equipped in these kinds of services. To sum up, neither characteristics of the region nor welfare regime has a strong impact on accessibility level. The highest level of most services (except of railways) is both in densely populated Ruhrgebiet and mountainous peripheral Navarre. Both of the above mentioned regions represent a different kind of settlement structure, the former is settled quite regularly, while the latter has a linear type but the results of conducted analyses suggest the level of SeGIs' accessibility better than in other cases.

In general terms, regions with better accessibility by railway are characterised by poorer motorway access and vice versa. This suggest the complementary role of both services related to

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transport infrastructure. Nevertheless, regions with poor accessibility to highways have higher car travel times with regard to most of SeGI types. Apart from density of service providers within the particular case study, it is the second, most important feature influencing the SeGIs' accessibility level.

Keywords: accessibility, services of general interest, cohesion, population grid.

1. INTRODUCTION TO THE ACCESSIBILITY IN CASE-STUDIES REPORT

The selection of case studies for the accessibility analyses was made due to their coverage of different welfare regimes and typology, as well as because of the spatial data availability. From all case studies analysed within SeGI project, five were incorporated into accessibility research. The cases are listed in the Table 1 attached below. The relevant project partner was responsible for collecting needed spatial data base, as well as for conducting the accessibility analysis within the common framework. Afterward all results were unified by IGSO PAS and suitable maps, graphs and statistics were elaborated.

Table 1. The case study selection for accessibility analysis

Country	Region	Characteristics		Welfare regime	Responsible Project Partner
Austria	Eastern Austria	Border-area, Mountainous, Urban/rural	EU15	Corporative	Univie
Germany	Ruhrgebiet	Densely populated, post-industrial, inside Pentagon	EU15	Corporative	BBSR
Hungary	Dél-Alföld	Agricultural, peripheral	NMS	Transitory	PlanIdea
Poland	Mazowsze	Urban/rural, metropolitan, core area	NMS	Transitory	IGSO PAS
Spain	Navarre	Mountainous, peripheral, urban/rural	EU15	Family	Nasuvinsa

Table 2. Type of services selected for accessibility analysis

Centrality level	Type of service
Low	Primary education
	Pharmacy
Medium	Secondary education
	Hospital
	Railway station
High	Tertiary education
	Motorway entry point
	Airport

The list of total number of services studied within SeGI project was too wide to perform an efficient analysis of accessibility. Hence, a selection of services of general interest was made in the manner that allows fulfilling the representative criteria according to the centrality of services and taking into account also the spatial data availability. The analysed services are presented in Table 2.

GEOSTAT 2006 population grid dataset was used for the analysis, showing the population distribution within one square kilometre cells. In the Navarre case study the SIOTN 2012 data (Navarre Territorial Development Indicator System) were used. The latter data set was aggregated into 1 km2 cells in order to make the results comparable. The travel origin was located in a centroid of all populated grid cells. The spatial database of service providers location was collected or geocoded where needed, individually by project partners. Similarly, the road network data was gathered and all calculations were made individually by the responsible project partners.

The applied method of analysis is the shortest travel time between the residential areas and the service provider. Although we are aware that the method has some limitations (for the discussion see e.g. Guagliardo, 2004), its advantages, namely the easiness of interpretation and limited computational requirements, seem to be crucialfrom the point of view of the assumed audience of the research, i.e. policy policy-makers. Further, we select time as a travel cost, as it is advantageousin geographically diverse territories (cf. (Lin et al., 2002; Martin et al., 1998).

The calculations of multiple shortest path were made using specialised GIS software designed for transportation analysis which allow attributing to all grid cells the time needed to reach the nearest location of service provider. Based on received results, eight sets of thematic maps (one for a type of service) were produced, adapting nineteen 5-minute ranges, staring from zero (where services location were identical to the centroid of populated cell) with the last category comprising travel times highest than 90 minutes. All sets of maps were supplemented with cumulative graph of population residing within successive time to the nearest service, and with basic statistics describing the results of accessibility analysis.
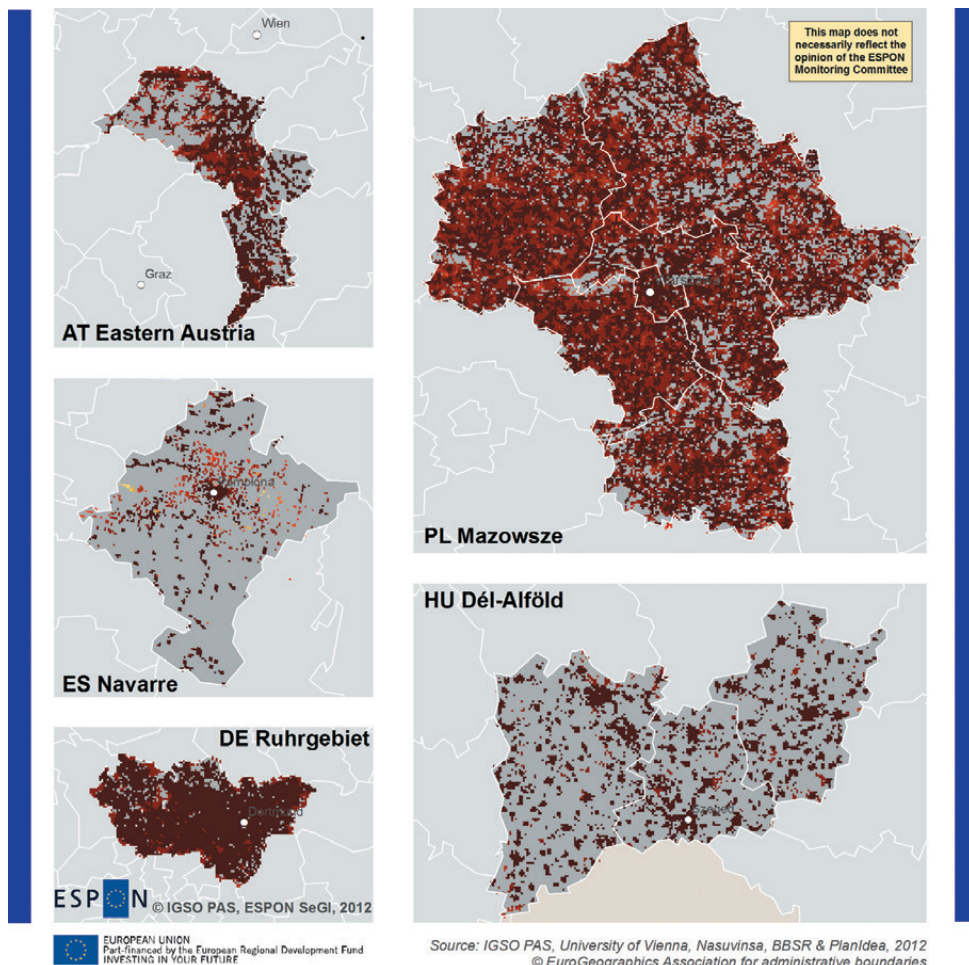
2. ACCESSIBILITY TO PRIMARY SCHOOLS

Primary schools in European Union are usually available in almost every municipality. Therefore they are accessible within 10 minutes in most parts of all case studies. The population weighted average travel time is between one and half a minute in Navarre (dense network of 217 primary schools in this region) to slightly over 3 minutes in Mazowsze. However, for students living in the periphery of these two regions travel time to the nearest primary school is much higher and exceeds 30 minutes in the peripheral part of Mazowsze and even 45 minutes in the peripheral part of Navarre (west of Pamplona). The lowest maximum travel time is observed in Ruhrgebiet and Dél-Alföld, where all inhabitants have an opportunity to access the nearest primary school in under 15 minutes. In Dél-Alföld in most municipalities, children can attend primary school locally until the age of 14.

3. ACCESSIBILITY TO PHARMACIES

Accessibility to pharmacies is on a relatively high level in all analysed regions. The population weighted average travel time is between about one minute in Navarre (there are 599 pharmacies in Navarre region) to slightly below 5 minutes in Eastern Austria. The maximum travel time to the nearest pharmacy is lower than 15 minutes in Ruhrgebiet, exceeds 30 minutes in Mazowsze and Navarre, and is very close to 30 minutes in Eastern Austria and Dél-Alföld.
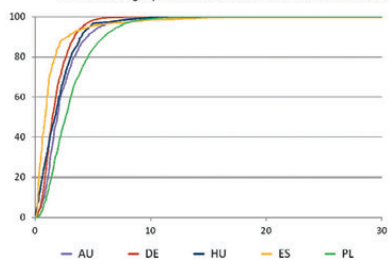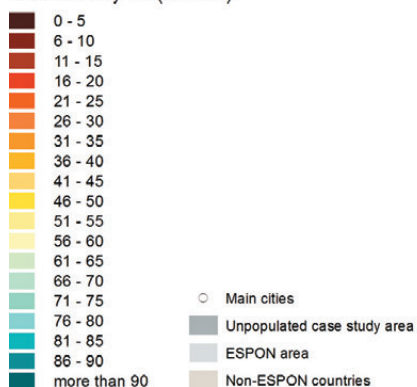
In Eastern Austria, the poorest access to pharmacies is observed in the north-western part of the region. However, most hospitals which are distributed evenly in Eastern Austria run a pharmacy and provide the opportunity of first aid, especially at late hours and weekends, when accessibility of pharmacies and doctors is limited.

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AT Eastern Austria

ES Navarre

DE Ruhrgebiet

PL Mazowsze

HU Dél-Alföld

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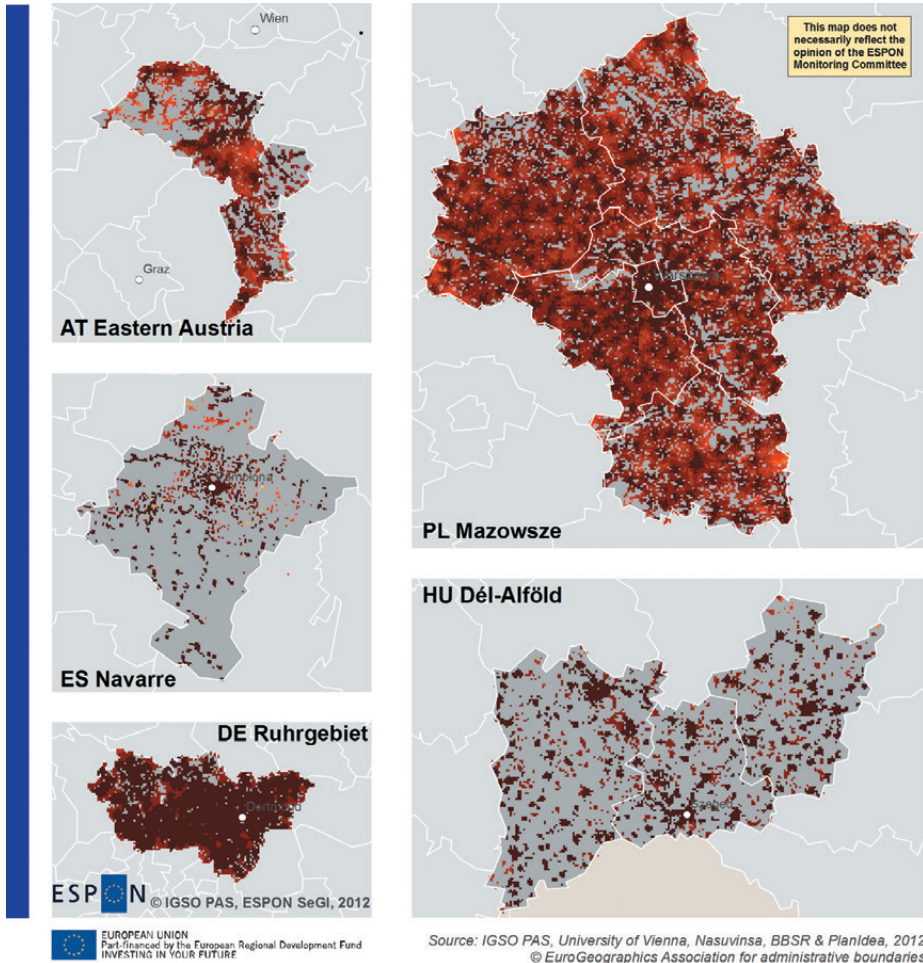© EuroGeographics Association for administrative boundaries

Accessibility to primary schools

Travel time by car (minutes)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 25
- 26 - 30
- 31 - 35
- 36 - 40
- 41 - 45
- 46 - 50
- 51 - 55
- 56 - 60
- 61 - 65
- 66 - 70
- 71 - 75
- 76 - 80
- 81 - 85
- 86 - 90
- more than 90

○ Main cities

Unpopulated case study area

ESPON area

Non-ESPON countries

— AU   — DE   — HU   — ES   — PL

	AT	DE	HU	ES	PL
Population weighted average travel time	2,3	1,8	2,0	1,5	3,1
Population last decile minimum travel time	4,5	3,4	8,4	2,8	5,9
Maximum travel time to the nearest service	19,7	12,5	15,0	45,5	30,2
Median for population	1,9	1,5	5,5	0,9	2,6
Median for raster cells	3,7	2,3	2,7	4,2	5,1
Standard deviation for raster cells	2,8	1,8	1,9	6,8	2,7

Figure 1. Accessibility to primary schools

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AT Eastern Austria

ES Navarre

DE Ruhrgebiet

PL Mazowsze

HU Dél-Alföld

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Accessibility to pharmacies

Travel time by car (minutes)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 25
- 26 - 30
- 31 - 35
- 36 - 40
- 41 - 45
- 46 - 50
- 51 - 55
- 56 - 60
- 61 - 65
- 66 - 70
- 71 - 75
- 76 - 80
- 81 - 85
- 86 - 90
- more than 90

○ Main cities

Unpopulated case study area

ESPON area

Non-ESPON countries
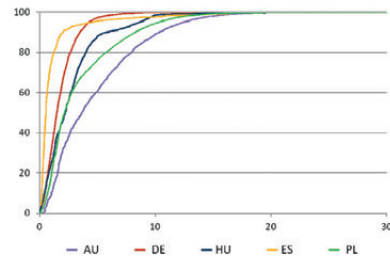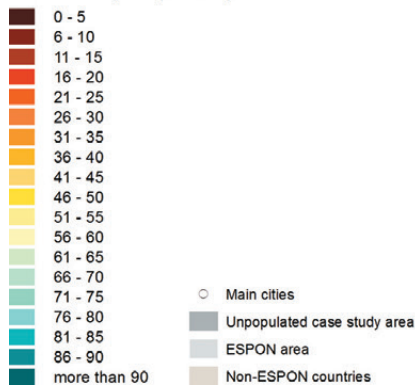
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	AT	DE	HU	ES	PL
Population weighted average travel time	4,8	1,8	2,8	1,2	3,4
Population last decile minimum travel time	10,3	3,5	5,7	2,0	8,2
Maximum travel time to the nearest service	29,2	14,4	29,5	41,2	32,0
Median for population	3,6	1,5	2,2	0,6	2,2
Median for raster cells	7,8	2,6	3,8	3,5	7,3
Standard deviation for raster cells	4,6	2,1	2,9	6,6	3,7

Figure 2. Accessibility to pharmacies

4. ACCESSIBILITY TO SECONDARY SCHOOLS

A wide choice of secondary schools is typical for urban areas. The best access to secondary schools is in Ruhrgebiet and Navarre. In both cases the population weighted average travel time is below 3 minutes. In Ruhrgebiet nearly most of the inhabitants have a splendid access to secondary schools. Only for 10% of the population of Ruhrgebiet region the travel time to the nearest secondary school is slightly higher and varies between 5 and 13 minutes.

In Navarre, very good accessibility and only 2-3 minutes average travel time to 117 secondary schools attract more than 33 thousand students. The level of accessibility to secondary schools is high despite the sparse population that is typical of the periphery of Navarre.

In Mazowsze, the situation is moderate due to the fact that secondary schools are in each district (*poviat*) or sometimes even in each municipality (*gmina*). However, the inhabitants of the municipalities located near the voivodeship borders have a slightly worse access to secondary schools.

In general, in all cases, except of Ruhrgebiet, the maximum travel time to the nearest secondary school is between 40 and 60 minutes for people living in the peripheral areas. The longest travel time is in the peripheral fringe of western and eastern part of Dél-Alföld region, where the population weighted average travel time is close to 11 minutes, and the maximum travel time is about one hour. However, in Dél-Alföld there has been significant growth in the range of secondary level education in the region over the last ten years, and the number of municipalities with secondary schools has increased.
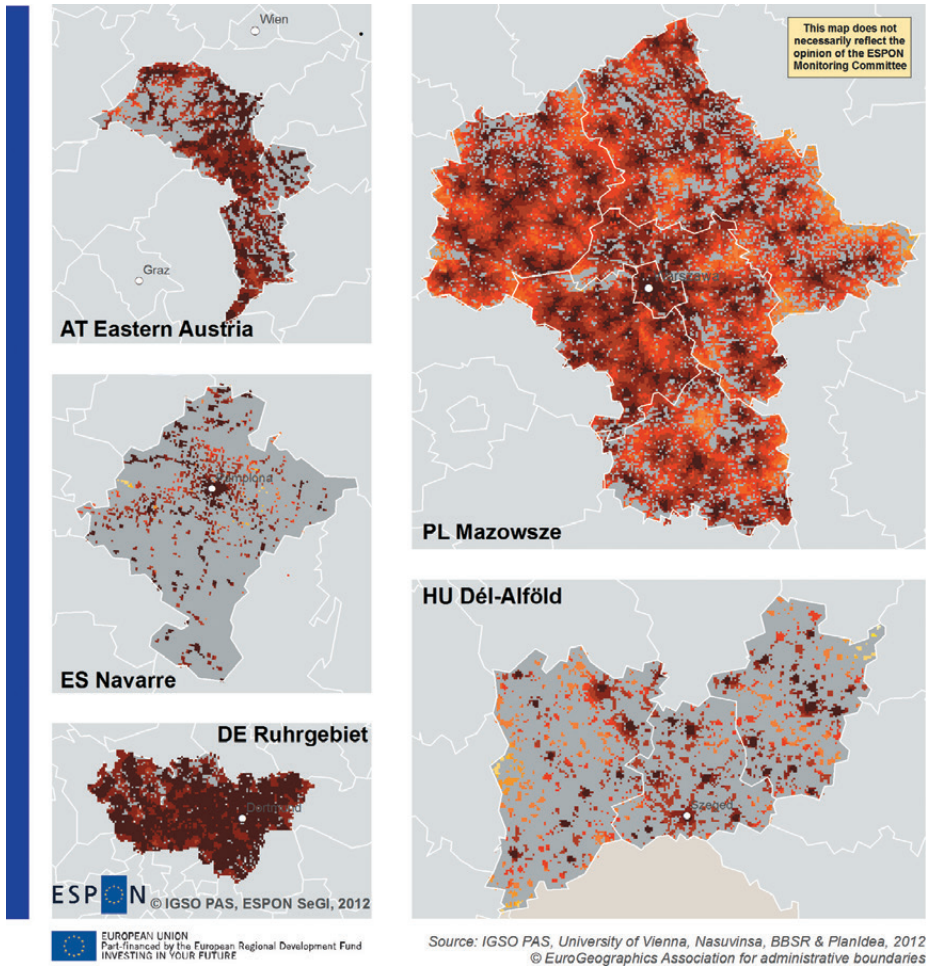
5. ACCESSIBILITY TO HOSPITALS

In general, a high level of accessibility to hospitals is in each of the analysed regions. The population average travel time is very low in Ruhrgebiet case (about five and half minutes). The maximum travel time to the nearest hospital is also the lowest – only 20 minutes. In Eastern Austria, Navarre and Mazowsze the population weighted average travel time is higher and varies between 10 and 12 minutes, which is also a satisfactory result.

In Eastern Austria, there are 13 hospitals which are distributed evenly in the district capitals. Only in the northern parts of the region, the travel time to the nearest hospital may be close to or longer than 30 minutes.

In Poland, there is usually a hospital in each commune (*poviat*). However, in the northern part of Mazowsze, it takes more than 60 minutes to get to the nearest hospital.
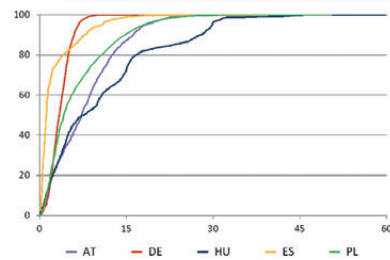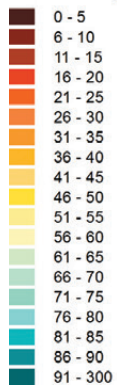
In terms of accessibility to hospitals, the worst situation is observed in the north-eastern part of Dél-Alföld in Hungary. The maximum travel time to the nearest hospital exceeds 74 minutes there, but for emergency cases the travel times are lower. Calculation focused on the so called weighted hospital centres, in compliance with the new health (hospital) infrastructural hierarchy. The emergency air service is well developed, and certain medical centres in Budapest, Kecskemét or Pécs are accessible within 20-30 minutes by air. However, supply of hospital beds in the region is worse than the Hungarian average. Bács-Kiskun county differs the most from the nationwide average: for example, the number of chronic beds is only 43.9 % of the nationwide average.

A similar situation is observed in the eastern part of Navarre, where the inhabitants of this peripheral area must travel more than one hour to the nearest hospital. In the north and south-western parts of Navarre inhabitants can use hospitals located very close to the border in the neighbouring regions.
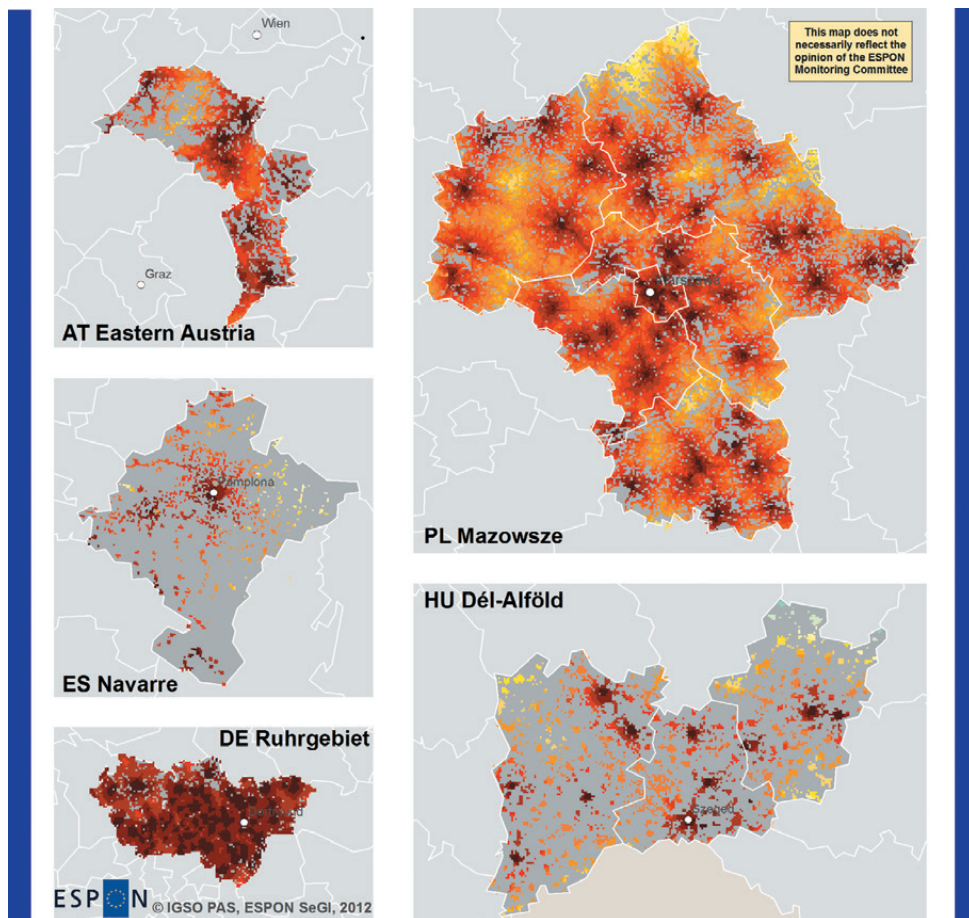
Figure 3. Accessibility to secondary schools

Figure 4. Accessibility to hospitals

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AT Eastern Austria

ES Navarre

DE Ruhrgebiet

PL Mazowsze

HU Dél-Alföld

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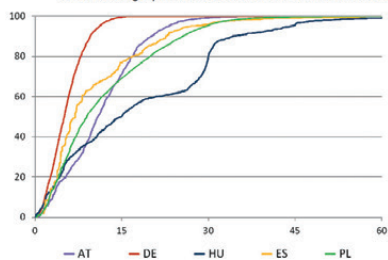Part-financed by the European Regional Development Fund
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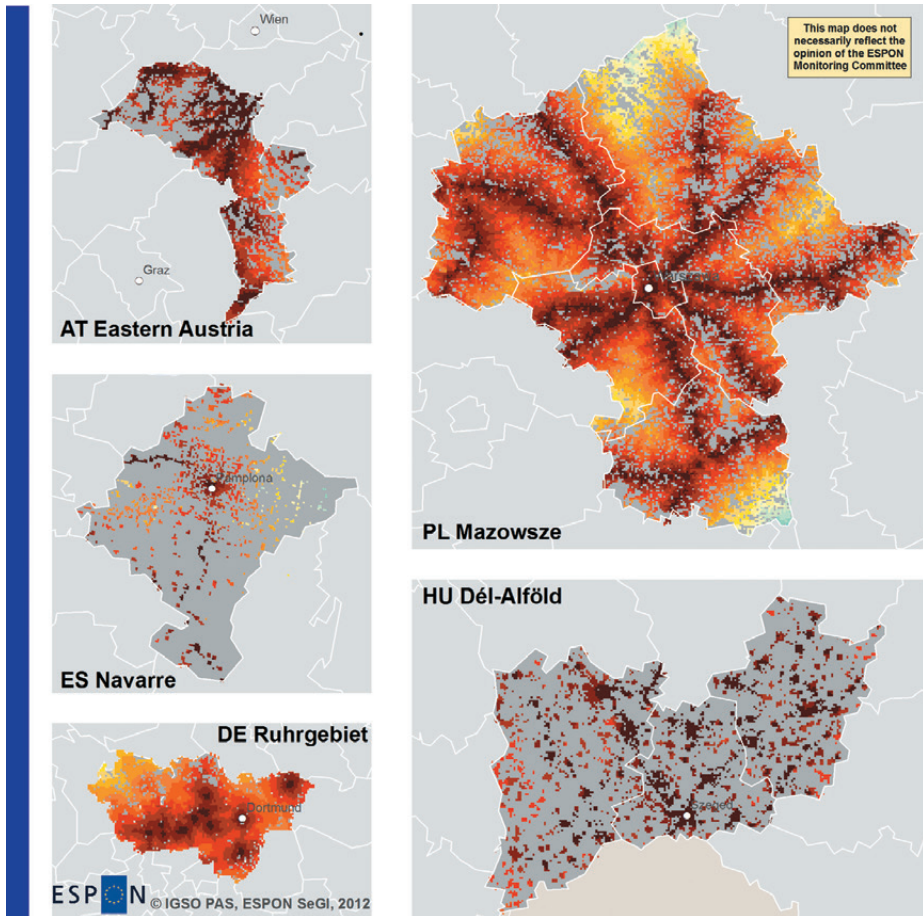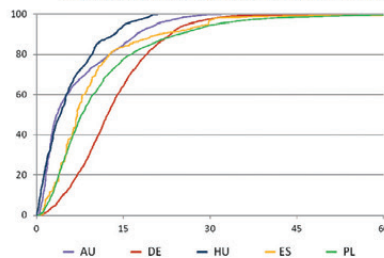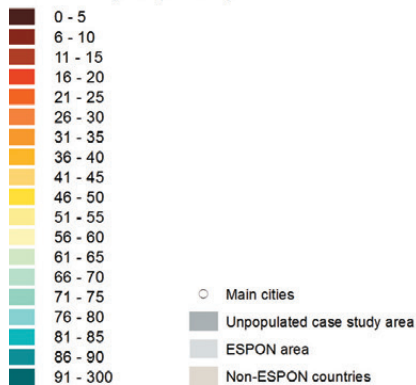## Accessibility to railway station

Travel time by car (minutes)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 25
- 26 - 30
- 31 - 35
- 36 - 40
- 41 - 45
- 46 - 50
- 51 - 55
- 56 - 60
- 61 - 65
- 66 - 70
- 71 - 75
- 76 - 80
- 81 - 85
- 86 - 90
- 91 - 300

○ Main cities
Unpopulated case study area
ESPON area
Non-ESPON countries

	AT	DE	HU	ES	PL
Population weighted average travel time	6,7	13,2	5,5	9,6	11,0
Population last decile minimum travel time	17,3	23,1	15,0	21,1	24,4
Maximum travel time to the nearest service	31,9	47,7	20,9	73,9	83,8
Median for population	3,4	12,2	10,1	7,0	7,7
Median for raster cells	9,1	17,5	6,3	17,9	17,1
Standard deviation for raster cells	6,8	8,6	5,1	13,3	12,8

— AU — DE — HU — ES — PL

Figure 5. Accessibility to railway station

6. ACCESSIBILITY TO RAILWAY STATIONS

The density of railway network in all case studies may be regarded as sufficient. The population weighted average travel time to the nearest railway station is about 10 minutes. The best accessibility results are achieved in Eastern Austria and in Dél-Alföld. Both regions have a very dense railway network, mainly due to their sudden development at the time of Habsburg Empire. However, after the Trianon Treaty, major railway lines e.g. Szabadka (Subotica) - Arad - Nagyvárad (Oredera) and Újvidék (Novi Sad) - Kolozsvár (Cluj-Napoca) lost their significance and the well developed structures fell apart. In Dél-Alföld, more than ten railway lines cross the whole area and nearly all bus or railway stops or stations can be reached within 15 to 30 minutes. This high density of railways provided a link between remote farmsteads and city centres. However, in the past five years several stops and even whole lines have been terminated and closed. In certain cases in Dél-Alföld the frequency of services is reduced, and private vehicles are taking over at the expense of all types of public transport.

As regards Eastern Austria, in the south of the region train connection hardly exist. This part of Eastern Austria was a part of Hungary, and no train connections to Vienna or Graz have ever existed. In the northern part, the main North-South connection in Austria (between Graz and Vienna) passes through the case study region.

In Navarre again (like in the case of accessibility to motorways results) the median for population and the median for raster cells differ a lot. It means that the worst accessibility to railway system is in the sparsely populated areas, in the eastern part of the region in particular. The existing railway network is undergoing modernisation, as a new High Capacity Corridor for passengers and goods will connect Navarre to other Spanish and European regions (Basque Country, Barcelona, Madrid and EU-France through Irun).

A similar situation to that in Navarre is observed in Mazowsze region where the railway network has a radial structure with its centre in Warsaw, and people live mainly along the railway (and motorway) corridors. However, in both cases, of Navarre and of Mazowsze, the maximum travel time to the nearest railway line in the regional periphery exceeds 70 minutes.

Surprisingly, in the north-western part of the Ruhrgebiet region the maximum travel time to the nearest railway line exceeds 45 minutes which is rather unsatisfactory for the inhabitants of this highly populated region.

7. ACCESSIBILITY TO TERTIARY SCHOOLS

The access to tertiary schools is obviously limited because of the relatively low number of tertiary schools and their "belonging" to the biggest cities. However, the population weighted average travel time to the nearest tertiary school in Navarre is only 5 and half minute. The reason is that Navarre has 3 universities in the main urban settlements (Pamplona and Tudela) as well as 25 other tertiary schools in the region. There are also other universities in the neighbouring regions.

In other cases, the population weighted average travel time is much higher and equals 15 (Ruhrgebiet) to 24 minutes (Dél-Alföld). In Eastern Austria, the areas which are located far from Vienna and Graz are less accessible because universities are located in big central agglomerations.

In Dél-Alföld, the location of educational institutions in the region is determined by the dominance of Szeged, with 27 000 students. In the western and north-eastern parts of the region, there

are areas with no tertiary school accessible within 45 minutes by car. The discrepancy between municipalities is thus very large.

In Mazowsze, there are tertiary schools in each of the former (before 1989) voivodeships and also in few other cities. The grid-based map clearly indicates that the access to tertiary schools is very good in close proximity to large or medium-sized towns in all parts of the region. However, at the regional periphery at its western and eastern fringe, it takes more than one and a half hour to access the nearest tertiary school.

8. ACCESSIBILITY TO MOTORWAYS

In general, in all five case studies at least one motorway is in operation. However, the regions vary in terms of motorway density - from a very dense motorway network in Ruhrgebiet, moderate motorway density in Navarre and Eastern Austria, to relatively low density in Mazowsze and Dél-Alföld. Thus the population weighted average travel time differs between about 4 minutes in Navarre and up to 47 minutes in Dél-Alföld. In particular, in Mazowsze and in Dél-Alföld the grid-based assessment shows that travel times of over 60 minutes to the nearest motorway are common.

The best accessibility to the nearest motorway is observed in Ruhrgebiet and in Navarre. In these case studies, the population weighted average travel time equals about 5 minutes. Such a good result is quite obvious when taking into account population density in Ruhrgebiet region (2800/km2). The region motorway network consists of A1, A2, A3, A31, A40, A42, A44, A43, A46, A52, A57, A59 and A516 motorway sections.

At first glance, the very good accessibility from the majority of the region to the motorway network in Navarre is rather surprising. However, the huge difference between the median for population and the median for raster cells shows that inhabitants of the region live mainly along the motorway corridors (A-12, A-21, N-121 and N-135 corridors). Moreover, in Navarre 300 km of roads pertain to the category of motorways and dual carriageways. The situation of less accessible north-eastern part of the region will significantly improve after the completion of Pamplona-Jaca highway.

In Navarre, as well as in Mazowsze, the motorway network has a radial structure, with the core of Pamplona and Warsaw. In the case of Navarre, the motorways lead to neighbouring autonomous communities and to France (links with San Sebastian-France, Victoria-Bilbao and Zaragoza-Barcelona, new Estella-Logroño and Irún-France links which were recently improved, and new Pamplona-Jaca and Pamplona-Tudela-Madrid connections which are under construction). In Mazowsze, the situation is different because a few sections of the existing motorways and express roads (S7, S8 and S17) still do not lead to neighbouring regions. The only motorway (A2 motorway from Łódź to Warsaw, in "full" operation since October 2012) is not included in the accessibility calculation, and four other express road sections are rather short and their impact on peripheral area of Mazowsze is relatively small. Minimum travel time to the nearest motorway or express road of the last decile of population in Mazowsze exceeds one hour. In the Mazovian voivodeship symptoms of polarisation can be observed in transport investment needs. They are concentrated, on one hand, in the Warsaw Metropolitan Area (especially the inlet routes improving the access to the capital city), and on the other, in the most peripheral areas, especially in the northern and eastern outskirts of the region.

The worst situation is recorded in the Dél-Alföld region in Hungary where the population last decile minimum travel time to the nearest motorway exceeds 90 minutes. It means that for more than 10% of the region's inhabitants the minimum travel time to the nearest motorway is more than one and half hour. The M5 motorway crosses the region from Budapest through Kecskemét to Szeged and

then the border with Serbia. There is also a 34 km extension of the M43 motorway from Szeged to Maków and M8 motorway section links M6 and road 51 through the Szekszárd bridge. The situation is most unfavourable in Békés County where no motorway or semi-motorway exists.

The accessibility to motorways in Eastern Austria is moderate. The north-south Vienna-Graz A2 motorway, the S6 Seebenstein-Sankt Michael and the S31 Eisenstadt-Oberpullendorf connections dominate in the area. However, in the northern part of the region the closeness of the A21 is also visible. Municipalities close to these central axes are rather well connected but otherwise, the accessibility to centres outside the region is low. The areas with good accessibility usually also show positive migration balances. More and more people are attracted by the motorway corridor and for this reason the population last decile minimum travel time is below half an hour which seems to be satisfactory.
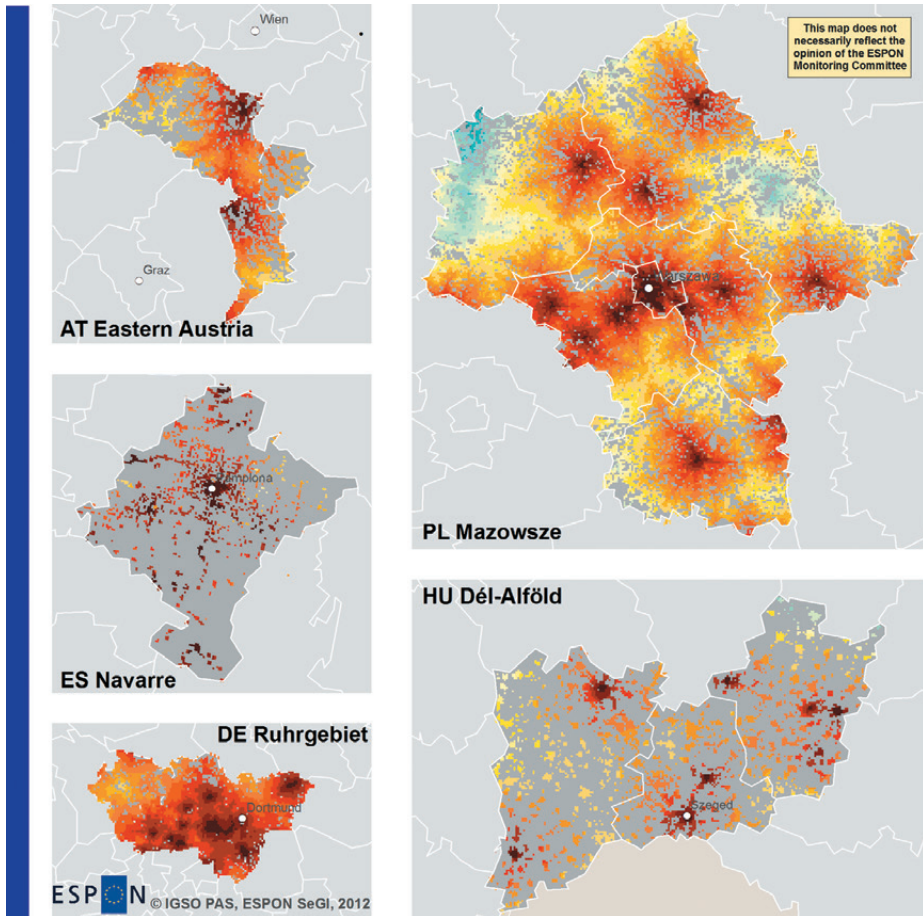
9. ACCESSIBILITY TO INTERNATIONAL AIRPORTS

Travel times to airports vary remarkably between case studies. Thanks to well located, and renovated in 2011, airport in Navarre in Noain (near Pamplona) and two other national airports situated very close to the regional border, Navarre accessibility to airports is very good, nearly as good as the accessibility to airports in the Ruhrgebiet region. The population weighted average travel time to the nearest airport for both cases is below 30 minutes, and population last decile minimum travel time is below 50 minutes. In Navarre, the worst situation is recorded in the southern part of the region where less than 20% of the population can reach the nearest airport by car in 30 minutes. In the Ruhrgebiet region, the poorest access to the airports is observed in the northern parts (north of Lippe River).

The average accessibility score characterizes Mazowsze and Eastern Austria. For both cases, the population weighted average travel time is between 50 and 60 minutes. In Eastern Austria, there are motorway links to the airports located outside of the region (Vienna and Graz). However, in the north-western parts of Eastern Austria accessibility to airports remains low.

The accessibility to the airports in Mazowsze region has significantly improved after the opening, in June 2012, of the Modlin airport, located north of Warsaw. However, people living in the southern and eastern part of the region still suffer from very poor access to the nearest airport.
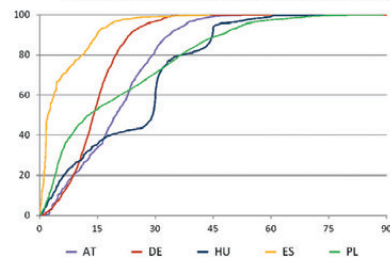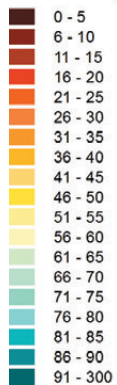
The poorest access to airports is recorded in Dél-Alföld in Hungary. The population weighted average travel time exceeds 130 minutes there, and the population last decile minimum travel time exceeds 3 hours, because the only international airport, Liszt Ferenc International, is located in Budapest. The median for population is also higher than the median for raster cells. The reason for this is that the best accessibility to the nearest international airport, due to its closeness to the Liszt Ferenc Airport, is in the north-western part of Dél Alföld which is sparsely populated. The situation is bad in the area on the east of Szeged because the Szeged airport's status is "a non-public airport with right to temporary border opening" while the Kecskemét airport is a military one.

This map does not necessarily reflect the opinion of the ESPON Monitoring Committee

AT Eastern Austria

ES Navarre

DE Ruhrgebiet

PL Mazowsze

HU Dél-Alföld

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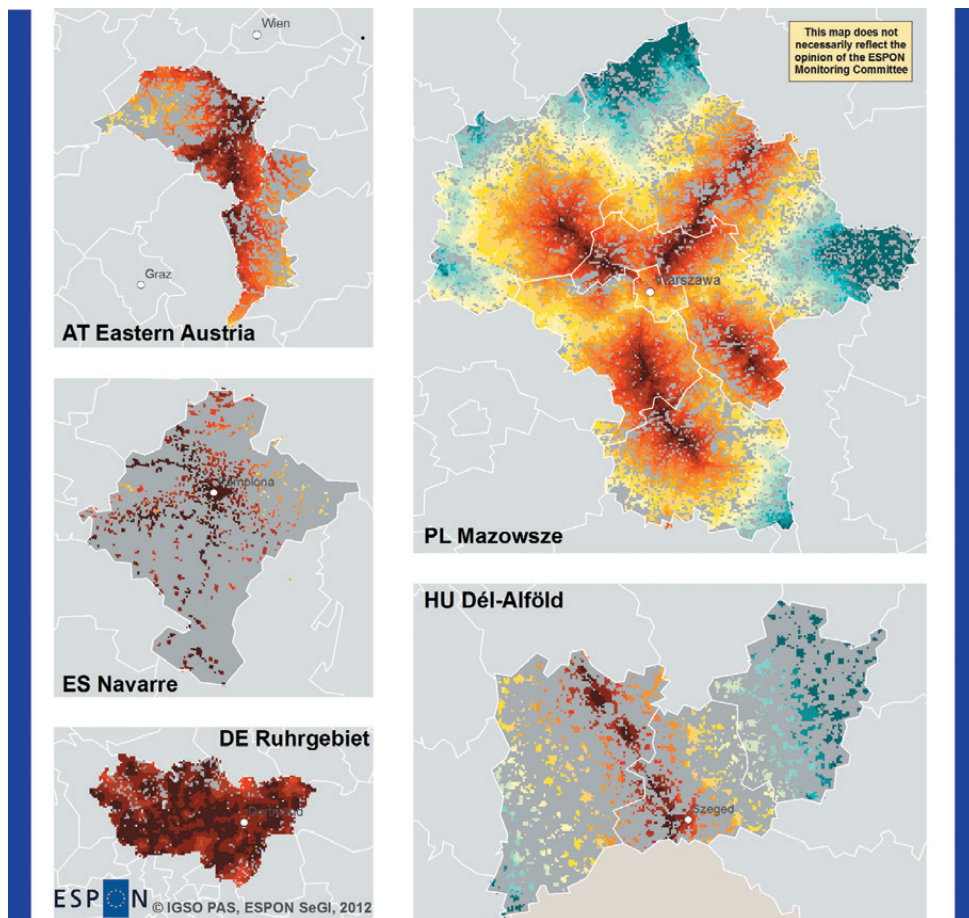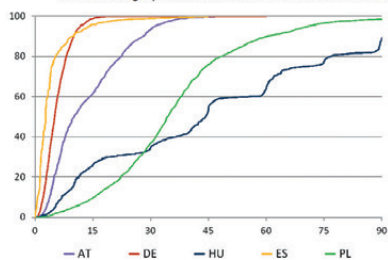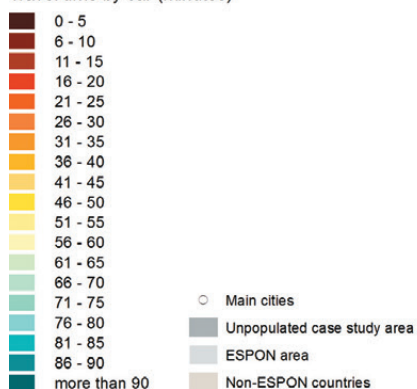© EuroGeographics Association for administrative boundaries

Accessibility to tertiary schools

Travel time by car (minutes)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 25
- 26 - 30
- 31 - 35
- 36 - 40
- 41 - 45
- 46 - 50
- 51 - 55
- 56 - 60
- 61 - 65
- 66 - 70
- 71 - 75
- 76 - 80
- 81 - 85
- 86 - 90
- 91 - 300

○ Main cities

Unpopulated case study area

ESPON area

Non-ESPON countries

— AT — DE — HU — ES — PL

	AT	DE	HU	ES	PL
Population weighted average travel time	19,8	14,5	24,2	5,5	19,9
Population last decile minimum travel time	33,6	23,3	44,8	14,8	46,8
Maximum travel time to the nearest service	61,5	42,4	74,6	60,0	89,0
Median for population	19,8	14,0	29,5	2,1	12,7
Median for raster cells	26,4	17,6	30,0	12,3	34,9
Standard deviation for raster cells	10,1	8,1	12,9	9,4	15,4

Figure 6. Accessibility to tertiary schools

Accessibility to motorways

Travel time by car (minutes)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 25
- 26 - 30
- 31 - 35
- 36 - 40
- 41 - 45
- 46 - 50
- 51 - 55
- 56 - 60
- 61 - 65
- 66 - 70
- 71 - 75
- 76 - 80
- 81 - 85
- 86 - 90
- more than 90

○ Main cities

Unpopulated case study area

ESPON area

Non-ESPON countries

Source: IGSO PAS, University of Vienna, Nasuvinsa, BBSR & PlanIdea, 2012
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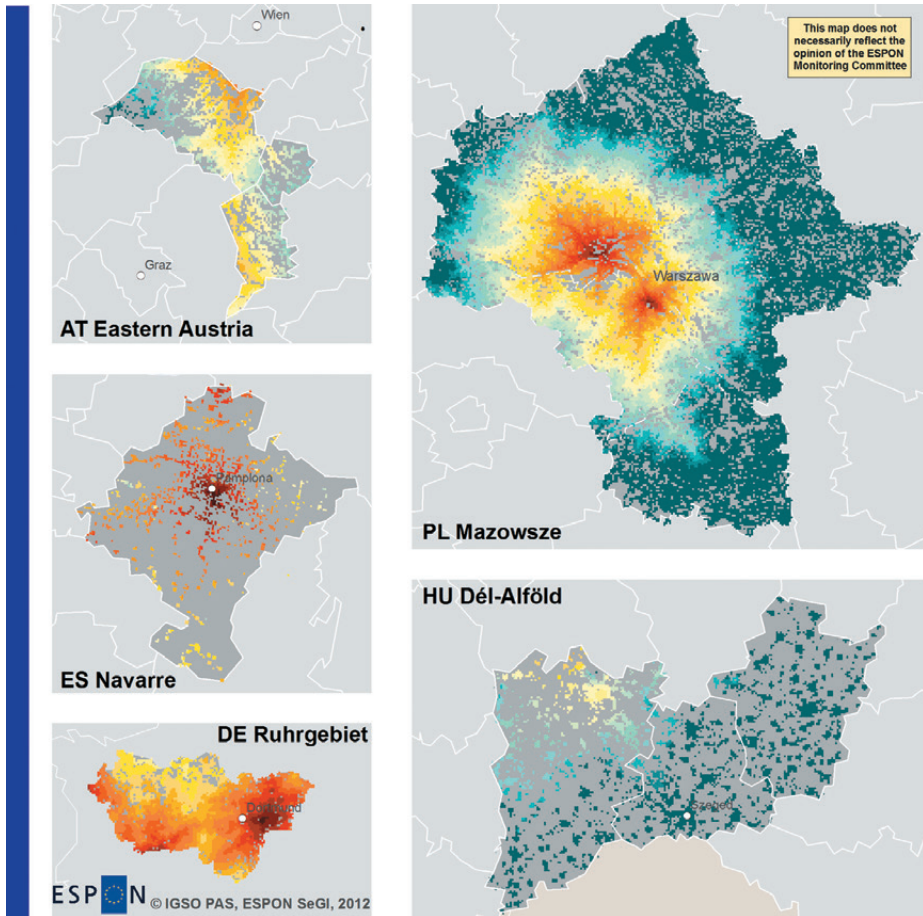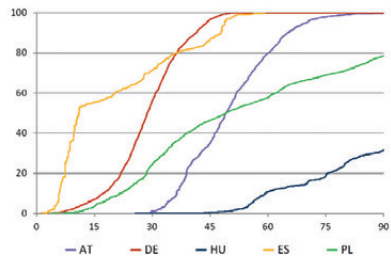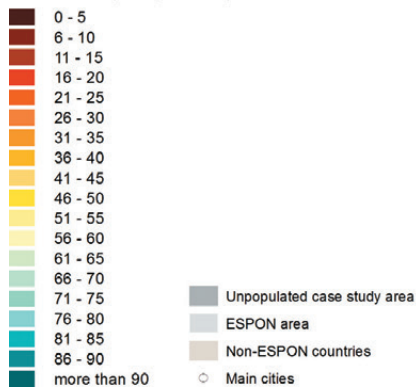© IGSO PAS, ESPON SeGI, 2012

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	AT	DE	HU	ES	PL
Population weighted average travel time	13.4	5.6	46.7	4.3	36.5
Population last decile minimum travel time	28.0	10.0	90.3	9.7	60.2
Maximum travel time to the nearest service	54.8	22.1	135.0	55.7	125.5
Median for population	10.1	5.0	44.2	2.7	34.3
Median for raster cells	17.8	5.8	45.5	7.9	40.9
Standard deviation for raster cells	10.4	3.7	32.1	10.6	24.1

Figure 7. Accessibility to motorways

Figure 8. Accessibility to airports

10. CONCLUSIONS

The theoretical background for measurement of travel times slightly differs between regions. However, the travel times delivered by the analyses provide enough information to make a comparison between regions possible (Table 3).

Table 3. Level of Accessibility of Services of General Interest

Region	Characteristics	Welfare regime	Centrality level Type of service							
			Low		Medium			High		
			PE	PH	SE	H	R	TE	M	A
Eastern Austria	Border-area, Mountainous, Urban/rural	Corporative	++++	+++	+++	+++	+++	++	+++	++
Ruhrgebiet	Densely populated, post-industrial, inside Pentagon	Corporative	++++	+++	++++	++++	++	+++	++++	+++
Dél-Alföld	Agricultural, peripheral	Transitory	++++	+++	++	++	+++	++	+	+
Mazowsze	Urban/rural, metropolitan, core area	Transitory	++++	+++	+++	+++	++	++	+	++
Navarre	Mountainous, peripheral, urban/rural	Family	++++	++++	++++	+++	++	++++	++++	+++

++++ excellent accessibility, +++ good accessibility, ++ moderate accessibility, + poor accessibility
PE – Primary education, PH – Pharmacy, SE – Secondary education, H – Hospital, R – Railway station,
TE – Tertiary education, M – Motorway entry point, A – Airport

As regards motorways, airports and hospitals, the accessibility to services of general interest varies between the analysed regions. In general, the accessibility to motorways is much poorer in Mazowsze and Dél-Alföld (transitory welfare regime with poorly developed road network). The above mentioned regions and Eastern Austria provide also the worst access to the airports. Inhabitants of Dél-Alföld region suffer also from the relatively poorer access to hospitals than people living in the other regions. For railway stations, pharmacies and schools of all types, all regions are more or less similarly equipped in these kinds of services. However, the accessibility to primary, secondary and tertiary schools is best in Navarre and Ruhrgebiet, while the inhabitants of Dél-Alföld and Eastern Austria have the best access to railway stations.

Summing up, neither characteristics of the region nor welfare regime has a strong impact on accessibility level. The highest level of most services (except of railways) is observed both, in densely populated Ruhrgebiet and in mountainous peripheral Navarre. The two regions mentioned above represent a different kind of settlement structure; the former is settled quite regularly, while the latter has a linear type of settlement. However, the results of analyses conducted suggest that the level of SeGI accessibility is better than in other cases.

In general terms, regions with better accessibility by railway are characterised by poorer motorway access, and vice versa. This suggests the complementary role of both services related to transport

infrastructure. Nevertheless, regions with poor accessibility to highways have higher car travel times to most types of SeGI. Apart from the density of service providers in a given case study, it is the second, most important feature influencing the accessibility level of SeGI.

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