

# Annex 10 h to SeGI Scientific Report

Case Study Report | Poland (Mazowsze)

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# 1. Introduction:

## 1.1. Description of country

Poland belongs to the group of large European countries, for it has a population of 38.5 million inhabitants, in an area of more than 300 thousand square kilometres. The capital city is Warsaw. The location of its current boundaries was largely determined after the Second World War. The country is located on the Eastern border of the European Union. In the north, it is bordered by the Baltic Sea and Russia. To the east, Poland has borders with Lithuania, Belarus and Ukraine; southern neighbours are Slovakia and the Czech Republic, and Western is Germany.

The natural landscape of Poland can be divided broadly into three relief groups: lowlands, highlands, and mountains. The eastern extremes of Poland display characteristics common to Eastern Europe, but the rest of the country is linked to Western Europe by structure, climate, and the character of its vegetation. Lowland characteristics predominate: the average elevation of the whole country is only 173 metres above sea level, while more than three-fourths of the land lies below 198 metres. The mountainous south part of the country consist of ranges the Beskid (*Beskidy*), Carpathian (*Karpaty*), and Sudeten (*Sudety*) mountains.

Non-governmental administration in Poland is organized on three levels. The largest units, at the regional level, are the *województwa* (provinces), which were consolidated in 1999; the year when they were reduced in number from 49 to 16. The second level is formed by 379 *powiaty* (counties or districts), followed by 2479 *gminy* (towns and rural communes). The last are the fundamental territorial units within Poland. All three levels *województwa*, *powiaty* and *gminy* are governed by councils, elected to four-year terms. These councils, in turn, elect the heads of local administration. The head of provincial administration, the *wojewoda*, is nominated by the prime minister.

Poland is not much territorially differentiated in terms of social distribution of wealth; however there is a clear division between Eastern (Mazury, Podlasie, Lubelskie, Świętokrzyskie and Podkarpackie regions) and Western parts of the country. The Eastern part of the country has gross domestic product (GDP) per capita almost three times lower than regions with the highest one.

As a result, in the early 1990s, industrial output and GDP dropped significantly (agricultural production also fell). Unemployment grew up to 20 % in 2002-2003. Inflation, however, began to drop, from 250 percent in 1990 to 10 percent in 2000 and 1.4 percent in 2006. Production and GDP also recorded dramatic turnarounds (since 1991 when it was – 7.0 percent), with an average annual GDP growth of 3.9 percent in 2010, and the country developed into one of the leading economies of the former Eastern bloc, as well as one of the fastest growing in Europe. Unemployment, which had been high at the beginning of the 1990's decade, righted itself in the late 1990s, falling to levels similar to those in western Europe in 1997–98 (i.e., to about 10 percent). The percentage of unemployed persons, however, rose once again in the early 21st century, climbing above 20 percent in 2003, when a downturn in the Polish economy was accelerated by a worldwide economic slowdown. After 2004 due to economic growth and out migration flows unemployment started to descend and in 2010 reached level of 8.2 %.

The country's accession to the European Union in May 2004 opened the labour markets of United Kingdom, Ireland and Sweden to the Eastern new EU members. This caused one of the biggest emigration flows in Poland's post-war history, and the country became one of the largest exporters of labour within the enlarged European Union. The annual migration is growing (official statistics registered 18.9 thousand in 2004 and up to 30 thousand in 2008 – unofficial numbers are higher, in 2009 UK Department for Work and Pensions estimated official number for 134 thousand Polish citizens). In addition to a decreasing birth rate, migration accounted for a real reduction in Poland's population over the past decade.

## **1.2. Description of the selected region**

Mazowsze voivodeship (region) is located in central Poland, spread over the Mazovian Plain divided by Wisła (Vistula) river. The present administrative borders of the region do not cover all historical and cultural areas that have been called Mazowsze in the past. The northern part of the region borders with the Warmińsko-Mazurski and Kujawsko-Pomorski regions (voivodeships); at east it borders Podlaskie and Lubleskie regions, on South the border is with Świętokrzyski region and on the West with Łódzki region.

Mazowsze is the largest (35 579 sq km) and the most populous (5.16 million inhabitants) of the 16 Polish voivodeships. Two-thirds of the province's residents live in cities, with Warsaw being the centre of the largest conurbation in Poland (the Warsaw metropolitan area). Its principal cities are Warsaw (1.7 million) Radom (226,000) in the south, Płock (127,000) in the west, Siedlce (77,000) in the east, and Ostrołęka (55,000) in the north. The capital of the voivodeship is the national capital, Warsaw.

The Masovian Voivodeship is divided into 42 counties (powiats): 5 city counties (miasto na prawach powiatu) and 37 "land counties" (powiat ziemski). These latter are subdivided into 314 communes (gmina), which include 85 town and cities.

At the turn of the 21st century, the Masovian Voivodeship ranked first among Poland's provinces in total value of industrial output and in amount of investments made by foreign sources. Warsaw is the financial capital of Poland and an important centre for Central Europe. Industrial activity is centred in the Warsaw Industrial District, which includes Warsaw, Płock Pruszków, Żyrardów, Piaseczno, Ożarów, Sochaczew, Grodzisk Mazowiecki, Legionowo, and Mińsk Mazowiecki. The majority of state enterprises are headquartered in Warsaw. Leading industries in the city include automobile manufacturing, steel production, food processing, and business services. Other industrial centres are Płock, where large petrochemical plants PKN Orlen operate, and Radom, which has a military factory. Even though the province is highly industrialized, two-thirds of it is farmland and is devoted to agricultural production. Mazowsze is a leading producer of potatoes in the country. Other major crops are rye, sugar beets, fruits, and vegetables. Warsaw is a hub for both rail and vehicular traffic, with access throughout Poland and across Europe. A river port on the Vistula operates in Płock. Warsaw Chopin international airport, in a southern subdivision of Warsaw, is the nation's busiest airport; a second region's airport (Modlin) started to operate in 2012.

## **1.3. Overview of the case-study report**

This report analyses services of general interest at both national and regional levels, with focus on the region of Mazowsze. Essential services of general interest are investigated at a national level, and grouped into economic and social categories. Economic services of general interest focus on: gas; water; waste and sewage; electricity; transport; electronic communications and ICT. Social services of general interest centres on: education; labour market services; public administration and defence; cultural and recreational services; care services; social housing and social security. For the purposes of this case-study, the national analysis centres on the service provision in Poland as this is the location of our regional case study, Mazowsze.

Having established a national overview of services of general interest, the regional case-study area of Mazowsze is studied in depth. Background information is provided to understand the region in its context, providing an overview of those services already analysed at the national level. Economic and social services of general interest are be examined in depth and with the input of the expert interviews undertaken for each service area. The following economic services of general interest are examined: sewage and sewage treatment facilities; transport and broadband/internet. Social services of general interest examined comprise: secondary education; tertiary education; healthcare – hospitals and housing.

## **2. National analysis of services**

### **2.1. Description of the welfare regime of Poland**

Poland can be described as a transitional country where market rules replaced the central planning system. Since 1989 local governments take on an increasingly important role in providing services of general interests; previous to this year, the majority of services were provided by the central administration by means of sectoral divisions. Socio-economic transition and reforms of the system empowered local administrations by providing budget for fulfilling needs of local communities (which became one of the main tasks of local offices). Apart from services which are provided by local administration (like supplying water, waste collection, etc.) there is a group of services which is delegated by the central government to lower levels of administration, like: primary education, social care on local level, health care (hospitals) on county level.

The Polish welfare regime can be described as transitory, starting with economy transformation in the early 1990s and changing towards market oriented economy. According to the categorisation of welfare regimes of Fenger (2007), the Polish system mix characteristics from both the Corporative-Conservative and the Social-Democratic types, while not developing into Liberal types. Fenger considers the transitory regime of Romania as part of the “Developing welfare states type”, which represents countries that are still developing towards mature welfare states. Both the programme variables and the indicators for the social situation remain clearly behind the levels of the other groups of countries.

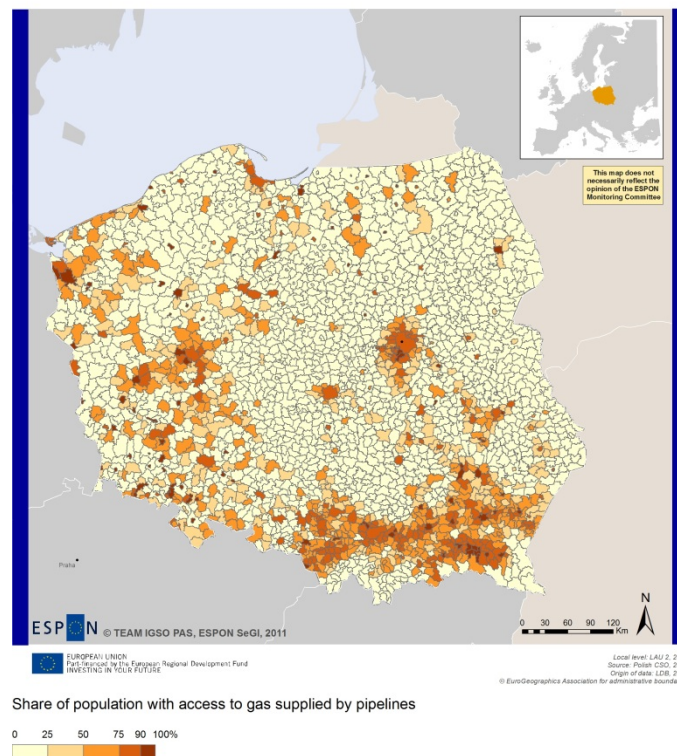
The national state is responsible for the regulation of all services of general interest in Poland. The provision is generally in the hands of local governments (water, sewage systems, primary education, care services, local roads). Health care and secondary education are of the competence of counties. After the transition, private companies entered the market and took up provision of key services (gas, electricity and telecommunications/ICT). State roads, tertiary education are provided by the national (motorways are operated by private companies). Railways are operated by a state-owned company.

#### **2.2.1. Economic services of general interest**

##### **Gas networks**

The expansion of the gas distribution network after 1990 in Poland took place primarily in rural areas, since a majority of towns was equipped with such systems already. In 1990, the length of local gas distribution networks amounted to 45.8 thousand km, most of which in cities (which accounted for 64% of the length). In 2009, the length of the network increased 2.8 times amounting to 138.6 thousand km, 55.1% of which is located in rural areas (66.5 thousand km).

## Gas



The largest number of homes connected to the local gas pipeline networks is located in Podkarpackie (where the gas natural resources are located) and Małopolska regions. The higher density of gas pipeline networks not considering towns is located in the rural areas which surround major cities. This phenomenon is particularly evident in suburban areas of Poznań and Warsaw, where the availability of distribution networks is clearly a function of the distance from the city. This suggests that the emerging suburban areas gas networks can be an extension of urban networks. In 2010, 1,719 municipalities had no gas network, and the further 97 the length did not exceed 1 km.

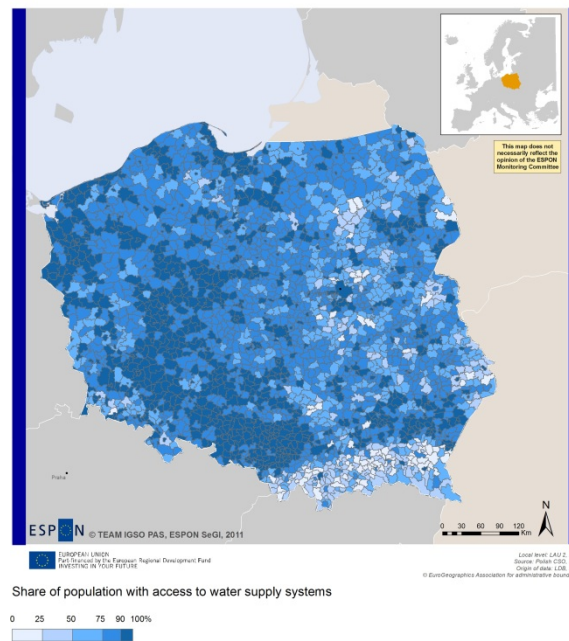
An alternative source of gas for private houses is gas cylinders. This type of provisions is most common in central and northern part of Poland, where the gas cylinders (propane-butane) is powering from 60% to 97% of houses. There is currently high availability of gas distribution points; therefore the importance of farm location (which was essential prior to 1990) has decreased, currently the main driver shaping demand for this product is price.

## Water supply systems

Water provision in Poland is under the responsibility of local authorities. Water supply and sewage disposal and treatment contributes to improving the living conditions and health of the local population, increases the potential for development of economic activity and contribute to the protection of the environment.

Water supply network is the most extensive technical infrastructure in Poland. In the years 1990-2004 the increase in the length of the water supply systems was 156.6% (total length of networks in 2004 was 239.18 thousand km). Even more dynamic increase was observed in rural areas within 4 years it amounted to 242% (while in the towns, only 56%). An alternative way of supplying water to homes is connection to the public and private wells. In 2009 8.6% dwellings in the country had water supplied this way. This method of providing water is most common in rural areas, the south-eastern part of the country and in Mazowsze and Lubelskie regions.

## Water supply system



The highest saturation in water pipeline network units (over 90%) is in the regions of west part of Poland: Opolskie, Wielkopolska and Silesia. In the case of the latter, the high percentage of homes connected to the water mains is due to the high level of urbanization. Urban areas are generally much better equipped in the technical infrastructure than rural areas. The shortest water pipeline networks (less than 50%) are located in the municipalities of Mazowsze, Podlasie and Lubelskie regions and the southern part of Małopolska and Podkarpacie regions. In the last two regions, play a very important role the water supply from wells and public gardens. Throughout the south-eastern belt of Polish regions, the percentage of homes connected to water supply systems ranges from 80-95% (of which one per seven house use local water mains).

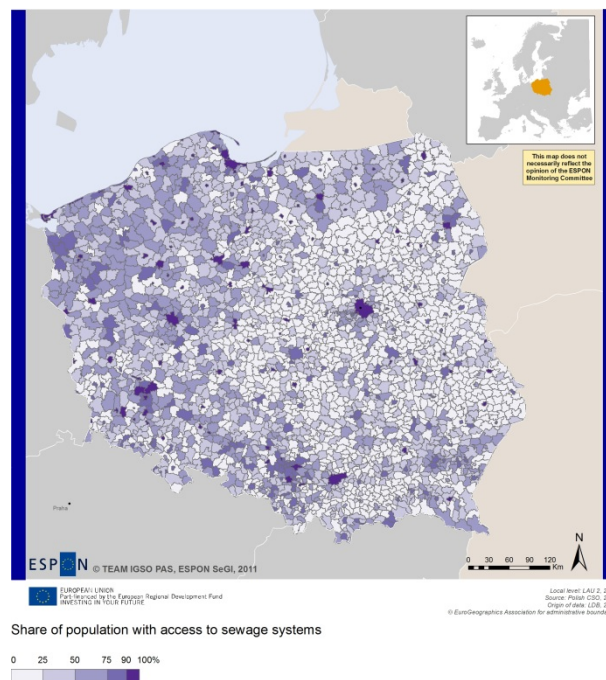
A similar phenomenon, though less diverse, can be observed on the west of the country, where the irregular water supply systems are complemented backyard by wells. As a result, the percentage of homes equipped with water supply network and local water supplies is 90% or more.

## Sewage systems

In 1990, there were 26.5 thousand km of sewage in Poland, of which 88% were located in urban areas. Within 20 years, sewerage systems expanded more than twice, and more than 60% of investments in sanitation were located in rural areas, which allowed for more than six times expansion of sewage networks in rural areas as compared to the 1990. In 2010, in rural areas it was 29.4 thousand km of sewage networks; in the cities it was an amount of 47.5 thousand km.

A connection to the sewage network is not the only possibility of shedding liquid waste from houses. A much more frequently used solution, especially in rural areas, are sewage tanks (called septic tanks), which are used for storing the waste that is later transported to sewage treatment plants. Unfortunately due to the cost of such services and the relatively low availability of sewage networks in rural areas, it remains a common practice to shed the liquid waste directly into the environment, which contributes to its pollution and as a result increases the possibility of contamination of drinking water. In 2010, in the whole country, 347 municipalities still did not have a sewage system, and in further 382 its length did not exceed 3 km.

## Sewage systems



Areas with the highest percentage of homes connected to sewage networks are the northern regions of Poland: Warmińsko-Mazurskie, Zachodnio-Pomorskie and Pomorskie. This is due to the former state farms, which were equipped with infrastructure systems under the communism. However, many of the rural communities of Mazowsze, Świętokrzyskie, Lubelskie and Podlaskie region remain without sewage systems. In these communes, most houses are equipped with local tanks used for temporary storage of sewage, which are an alternative to the lack of sewerage systems. Least-developed areas with sewage networks are Lubelskie and Świętokrzyskie.

In 2003, about one in 6 villages with water supply network was equipped also with sewage network. Such a large disparity in development between the networks resulted, among others issues, in a cost of construction of 1 km of sewerage network four times higher than the cost of construction of 1 km of water pipeline. This entailed not only financial, but also organizational difficulties (e.g. long-term investment plans of municipalities). In 2010, new possibilities of additional investments increased this share of municipalities with both networks to one per three.

Sewage treatment plants, which according to the law should be located at the end of all sewage networks, are unfortunately relatively rare in the rural areas. Since the beginning of the 1990s, in Poland, more than 1.3 thousand sewage treatment plants were constructed, but more than one third of them support inhabitants of urban areas

The most common types of sewage treatment plants in the country are four: mechanical, physical-chemical, biological and biological with improved biogenic nutrient removal. The most frequent are biological treatment with improved biogenic nutrient removal; however the largest amount of waste is processed in biological waste treatment plants.

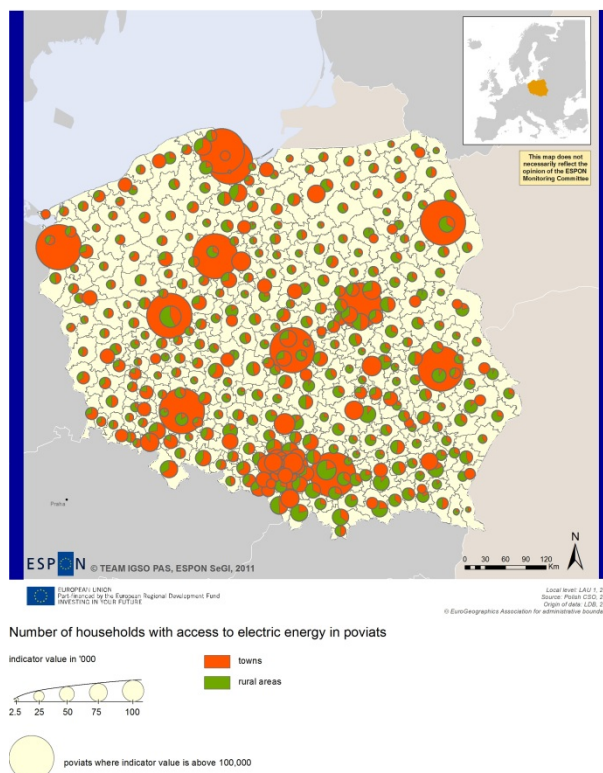
In 2008, the waste treatment plants provided services for 63% of the country population (86% of urban and 14% rural). The largest number of the population served by waste treatment plants lived in the north-western part of Poland. This coincides with more than average development of sewage networks in this part of the country. The smallest percentage of people served by the sewage treatment plants was in the regions of central, eastern and south-eastern Poland (Łódzkie, Mazowieckie, Lubelskie, Podlaskie, Podkarpackie and Małopolskie). Only 22% of sewage treatment plants in Poland are serving rural areas.



## Electricity

With the electrification that was carried out in rural areas since the mid-twentieth century and completed in the first half of the 80s, it is believed that access to electricity in the country is universal. However existing networks are not highly reliable in providing electricity, especially in rural areas. An inspection conducted by the Supreme Chamber of Control in the early 1990s showed that the supply of electricity was insufficient and constituted a barrier to development of agricultural production.

### Electric energy



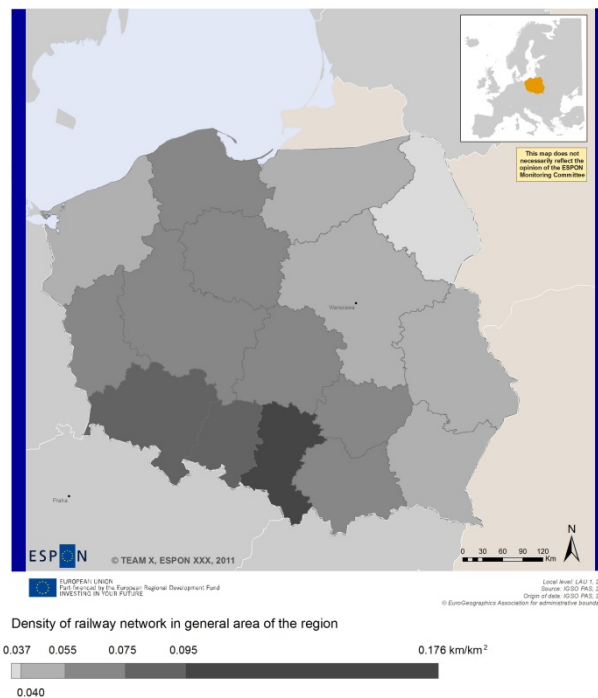
In 2009, virtually all municipalities had access to the electricity networks of low and medium voltage, (including 380 V), the most widely used in rural areas. The share of individual farms with access to the low voltage net ranged from 5.5% to 93.5%. There were much less such installations the northern and south-western parts of the country than in the rest of the regions.

## Transport networks

The transport communication system in Poland was developed in the 19th and early 20th centuries, when the country was divided between Russia, Germany, and Austria. These three areas thus were developed in different economic and political conditions, and the main railway lines were centred on the (Polish) capitals of the three empires. The density of the railway networks in the three sectors was uneven. In 1918, an independent Poland took over the railroad system, redesigned and rebuilt it according to the standard European gauge. Among the most important railway lines built after that time were those linking Warsaw with Poznań and Kraków and a coal trunk line linking Upper Silesia with the newly built seaport of Gdynia.

After the devastation of World War II, the railway system was reconstructed once again, and the most heavily used lines were converted to function with electric power. Because of the location of the country, Polish lines were important in the carriage of transit freight among the socialist countries of Eastern Europe, notably between the Soviet Union and East Germany and between Czechoslovakia and Poland's ports.

## Railway network



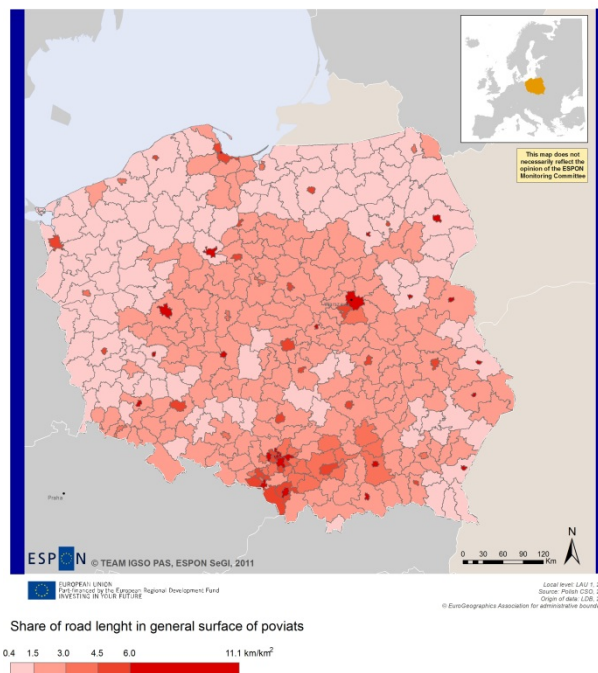
The demand for rail transport fell sharply, however, after the communist era, for both freight and passengers. In the last decade of the 20th century, there was a 41% drop in railway tonnage and a 58% decrease in passenger trips by rail. The railways, administered by the Polish State Railways (*Polskie Koleje Państwowe*), began undergoing a process of privatization in the early 21st century, which led to a division between a company providing long-distance transport services (PKP Intercity) and a company providing public transport services within a regional dimension (*Przewozy Regionalne*).

Polish public roads are grouped into categories related to administrative units. Motorways and expressways, which are the fastest and highest quality roads in Poland, are part of the national road network. Public roads in Poland are: national roads (18,801 km), voivodeship roads (17,690 km), country roads (11,379 km), local roads (120,419 km).

In recent years, the network has been improving and government spending on road construction recently saw a huge increase, due to rapid development of the country and the inflow of European Union funds for infrastructure projects. Currently three major motorways which will span whole country are under construction. In 2012, 7 out of 12 Polish largest cities have motorway connection with high speed road network in Europe (Gdańsk, Poznań, Łódź, Warszawa, Wrocław, Katowice, Kraków). Since 2004 Polish road network system is undergoing intensive modernization due to EU funds. In 2011 there were 1224 km of motorways, 957 km of expressways and an extensive network of other roads (of which about 1,200 km are dual carriageways connecting all major cities).



## Road network density



The middle course of the main Polish river, the Vistula, contains many navigational hazards, and the river is thus a less-important waterway than the smaller river Oder. The modern Gliwice Canal links the Oder to the Upper Silesian industrial region and carries coal to the port of Szczecin. The Oder basin is also linked to the lower Vistula by the Bydgoszcz Canal. Inland navigation is of little importance in Poland; however, less than 1 percent of Polish freight is carried on rivers and canals. On the other hand, shipping is well developed, and there are three large seaports—Szczecin (the largest), Gdynia, and Gdańsk—as well as smaller fishing and coastal navigation ports.

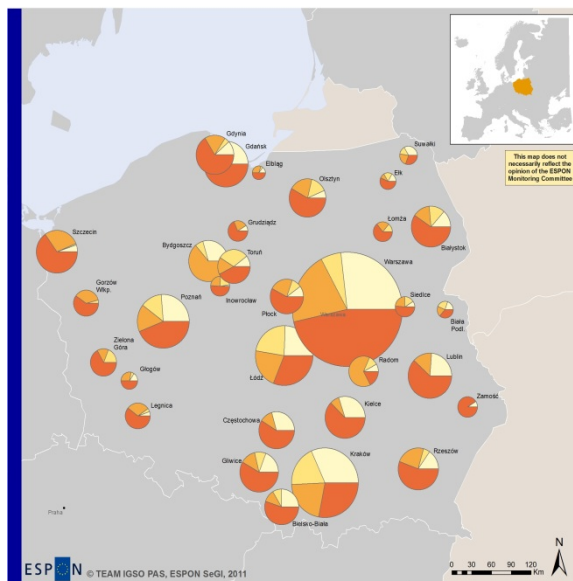
Passenger air traffic has more than doubled since the collapse of Polish communism. Domestic and international air transport is provided by LOT (*Polskie Linie Lotnicze*), a state-owned enterprise partially privatized in 1999. There are numerous international routes centred on the Warsaw airport.

Polish airlines' market was closed until 2004, with bilateral agreements between countries served by the national hub-Warsaw. Regional airports were mostly serving passengers travelling to and from Warsaw, and were controlled by the PPL (*Polskie Porty Lotnicze* – Polish Airports Company, a state-owned airports authority). However, after the deregulation in the early 2000s, all airports became individual companies with local governments involved in their management, what led to a partial decentralisation. Soon after opening of Polish sky for competition, direct flights to and from abroad to regional airports became more often. There are currently 12 passenger airports in operation in the country.

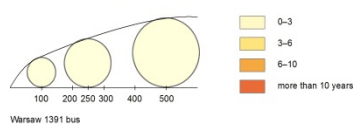
Nevertheless, the rapid development of the unsaturated market and the existence of vast areas of land not covered by airports within 100 kilometres of journey, allow assuming that many new airports are still necessary to provide proper accessibility to this service. Especially the area of eastern Poland should be better penetrated by airline traffic. There is a network of secondary airports that could be used, but lack of capital and expertise hinder their development and utilisation.

The majority of Polish cities have public bus transport service. Generally every town with more than 30 thousand inhabitants have its own local bus company, which operates under supervision of local government. In a few cities (Lublin, Kraków, Warsaw, Poznań) private companies operate on certain lines upon agreement with local authorities.

## Public transport – buses

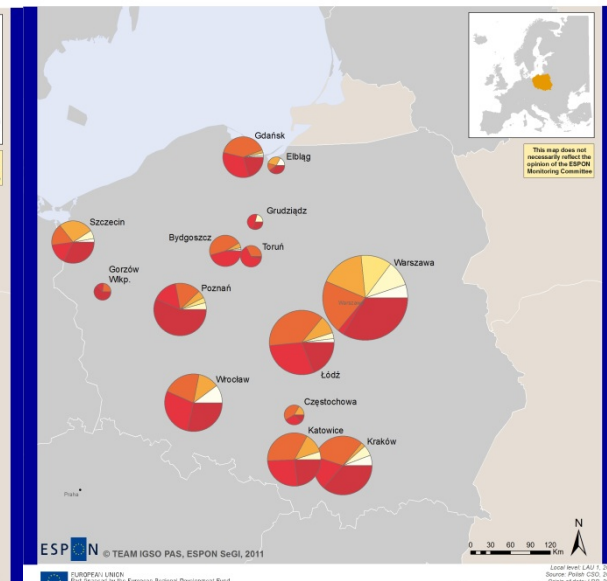


Number and age structure of bus fleet

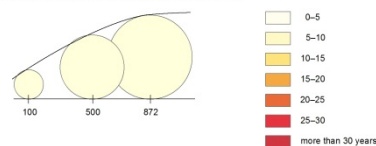


Warsaw 1391 bus

## Public transport – trams



Number and age structure of tram fleet



Until the 1990s, interurban connections were operated by a single, state-owned company, the PKS (*Państwowa Komunikacja Samochodowa*). Since then, it has been broken into a number of independent national and municipal enterprises. In addition, several private operators emerged. There are two classes of service distinguished by vehicle length: the so called “autobus” – (12 meters or longer vehicles providing long distance services) and bus – (shorter vehicles run on local/suburban connexions). Although both public and private companies often use the same bus stops, they tend to use different stations.

Large cities apart from bus network have also tram service as primary mean of public transport. In 2010 there were 14 tram networks providing service for over 30 cities (including suburban networks as well as providing service for more than one city in Silesia conurbation). The total length of the network varies from a little bit over 200 km in Silesia and less than 10 km in Grudziądz. Since the 1990's, local governments are aiming to upgrade and extend the existing network and trams providing services in light rail standard (*szybkie koleje miejskie*) e.g. Poznań and Kraków. Three Polish cities (Gdynia, Lublin and Tychy) have also trolleybus service within their public transport system.

## Telecommunications

In 2010 Poland had 10.3 million telephones on main fix lines and over 44 million cellular telephone users. The former monopoly state owned telephone company (TPSA) has been mostly privatised, with France Telecom buying the largest share. Various other companies have entered the fixed phone market, but generally aiming for niches (e.g. Sferia with fixed wireless, Netia, etc.). Whilst prices have reduced and availability has increased considerably since the introduction of competition, there is little sign of TPSA's market share being seriously reduced. However there are areas (mostly rural) where due to the low capacity of network or exchanges provision, this service remains restricted.

The long waiting list for fixed line telephones helped fostering a boom in mobile telephone use; and all mobile phone operators in Poland use GSM. There are three competing networks with similar market share, T-Mobile (T-Mobile and Heyah brands), Orange Polska (Orange and POP brands) and Plus (Plus and Sami Swoi brands). The fourth network, Play, owned by Netia and Novator Telecom,

started offering UMTS network services in early 2007. All mobile operators have UMTS services in the major cities, with nationwide coverage planned.

### Optic cable fiber lines



Regarding online communications, in 2011, the number of Internet users (16.7 million) exceeded the number of personal computers (14.9 million), reflecting the presence of multiple users per terminal and of public computer stations.

The most popular ADSL services for home users in Poland are Neostreda provided by TPSA (former telecommunication monopoly) and Net24 provided by Netia. Both provide download speeds in the range of 1 to 80 Mbit/s and upload speeds of 512kbit/s or more. Business users as well as some home users use Internet DSL TP also offered by TPSA.

Internet access in Poland is among the most expensive in Europe (according to OECD data). This is mostly caused by the lack of competitiveness and infrastructure shortage. New operators like Dialog and GTS Energis are making their own provider lines and offering more attractive and cheaper service. At the beginning of 2011, the Polish Office of Electronic Communication forced the TPSA to rent 51% of their ADSL lines to other Internet providers at a 60% discount of their market pricing.

## 2.2.2. Social services of general interest

### Education

After the administrative reforms of 1990 and 1999, the division of tasks in the field of education is as follows:

- in the competence of the local/municipal authorities are kindergartens, primary schools and grammar schools;
- county authorities are responsible for high schools and special education;
- regional authorities respond for 'atypical schools' and teachers' colleges; and
- the central government has competence for universities.

Generally education in public schools at all levels is free. In the case of kindergartens and nurseries fees are relatively low (at around 100 euros per month). Due to the lack of obligation of pre-schooling (at kindergarten level) and relatively large numbers of private kindergartens, this level of education is characterized to high extent by rules of free market economy in which the supply is shaped by demand.

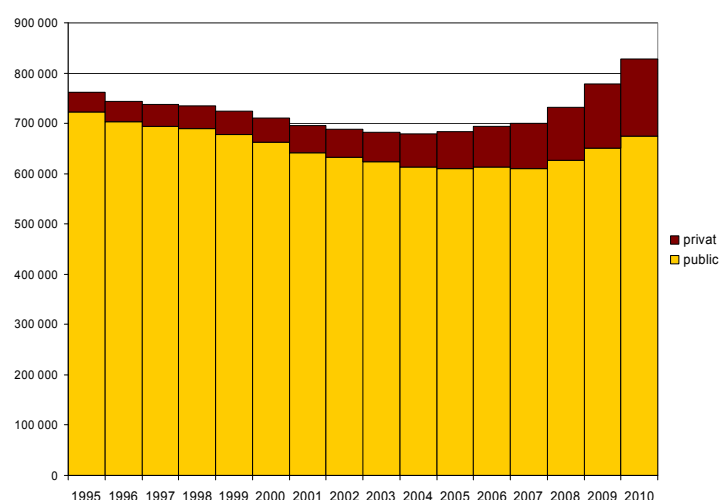


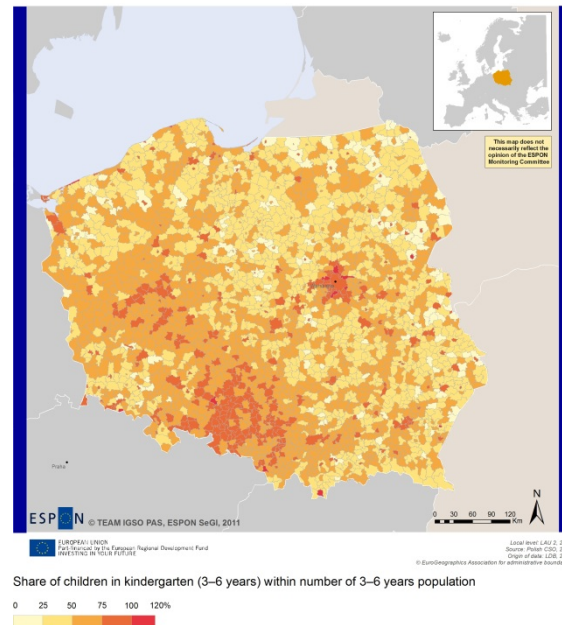
Fig 1. Number of places in the public and private kindergartens in Poland in the period 1995-2010

Pre-primary education is provided in the kindergartens, as well as pre-school classes at primary schools. It should however be noted that it is compulsory only for six years old children, while for a 3-5 year old children kindergarten is not mandatory (currently, as a result of changes in the education system, 6-years old children will attend pre-school classes compulsorily). In the last few years, a large increase of private kindergartens in Poland was observed. In the early 1990s the municipal government became the entity operating kindergartens. This has led to significant changes in the spatial variation of provision of these services at the municipal level. Due to the high costs of the nursery, associated with dispersed settlement system and a small number of children per unit (approximately three times less than in urban areas), many rural communities have decided to liquidate kindergartens in their area. In 1995, the proportion of capacity of private kindergartens in relation to the total capacity of kindergartens does not exceed 5%, while in 2010 it is almost 20%. The largest increase in the number of kindergartens, mostly private ones, took place in large cities and suburban areas.

The largest level of participation of children in pre-school education is characteristic of cities and metropolitan areas as well as the western part of the Poland. These areas are, in general, characterized by significantly higher level of urbanization than the eastern part of the country. The lower participation rates children in kindergartens in the eastern part of the country are conditioned by a number of factors - (1) the lack of such facilities in some communes/municipalities due to their

liquidation in 1990, (2) scattered settlement system, (3) a multi-generational model of the family (the traditional rural areas are more often than other areas inhabited three generational families living together) in which grandparents take care of children, and (4) the importance of functional structure and employment in agriculture.

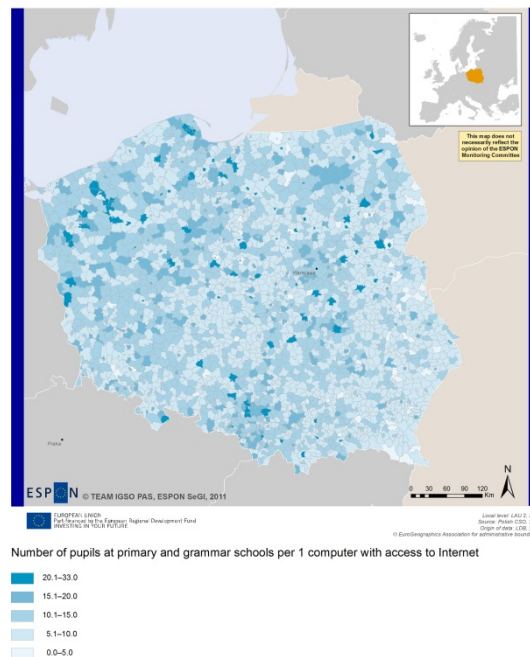
### Children in kindergartens



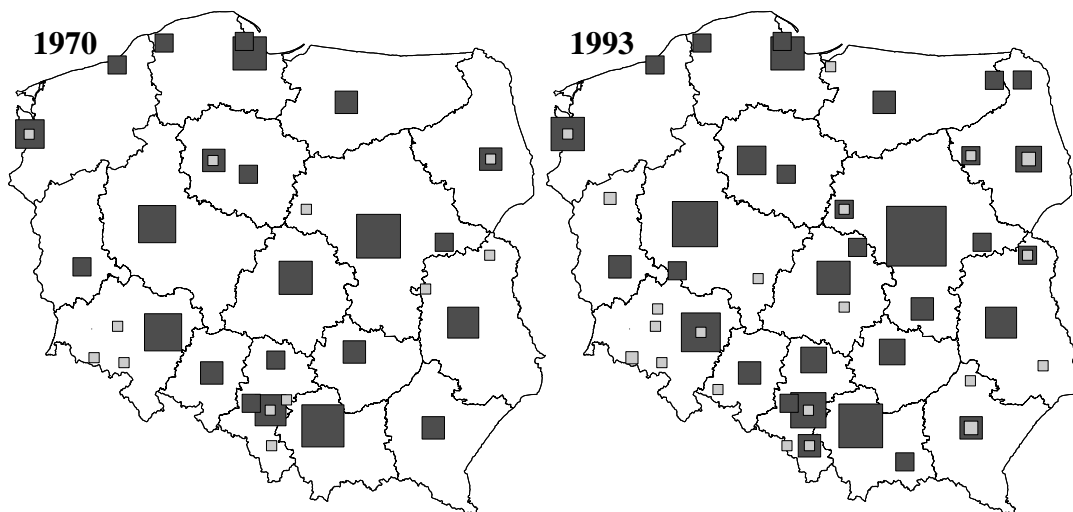
Primary and grammar schools fall within responsibility of local government/municipality. Therefore, within each municipality there is at least one facility of this type. Thus, the availability of primary and grammar schools is widespread. The problem may be related to the service spatial accessibility and the need for school buses. The secondary education falls into the responsibility of the county government, and therefore most schools of this level are located in county centres.

Schools in rural areas very often face financial shortage and are under-equipped (regarding teaching aids), so the learning process is dominated by the verbal communication. More recently, processes of intensive computerization of schools can be observed. At the beginning of 2000 there were dozens of pupils per one computer with access to Internet, while currently it is only a few pupils per computer.

## Access to Internet in primary and grammar schools



The final level of education is tertiary education. In 1970, universities were located in twenty-three Polish cities, and branches of tertiary education facilities in further thirteen cities. Such spatial composition of tertiary education facilities existed until the end of the 1990s. In the early 1990s the number of academic centres was limited to thirty-three cities where universities were located and twenty-one cities with branches and long-distance learning facilities. In subsequent years, there has been a dynamic growth in the number of schools and branches. In 2002, as many as 133 cities could be considered as academic centres (with a minimum of one university or tertiary education facility branch). This process has led to the fact that (according to an ESPON study) "university structure in Poland is the most polycentric in Europe" (Potentials for polycentric development..., 2004, p. 100).





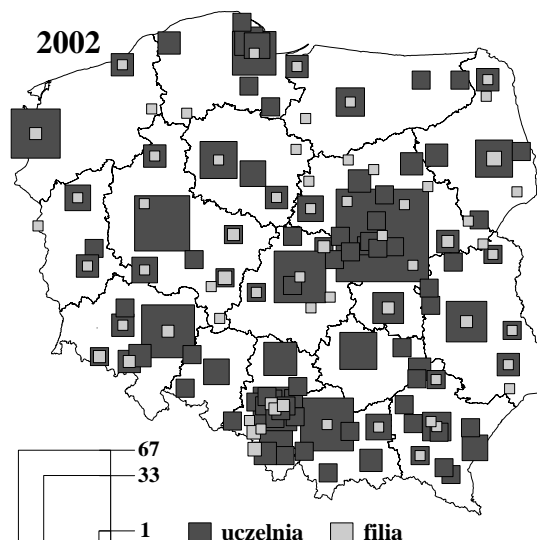


Fig 2. Size of universities (uczelnia) and branches (filia) in Poland in 1973, 1993, 2003

The increase in the number of institutions of higher education in the early 1990s was mainly due to the emergence of private universities. The first private universities were established in 1991, when a new Law on Higher Education was implemented. These schools were created in medium-sized towns. Moreover most of state universities (as well as newly created private ones) began to open branches. This was due to the need of meeting the demand for higher education in smaller cities, as well as the limited capacity of lecture halls in home towns.

The analyzed process is strongly conditioned by the spatial distribution of the settlement network and the hierarchy of cities. Tertiary education facilities gradually began to appear in smaller cities, however with the largest increase of new units in the surrounding of major traditional academic centres. This was due to the fact of the limited mobility of academic staff, mostly associated with large academic centres, and the creation of new universities in places with the greatest demand.

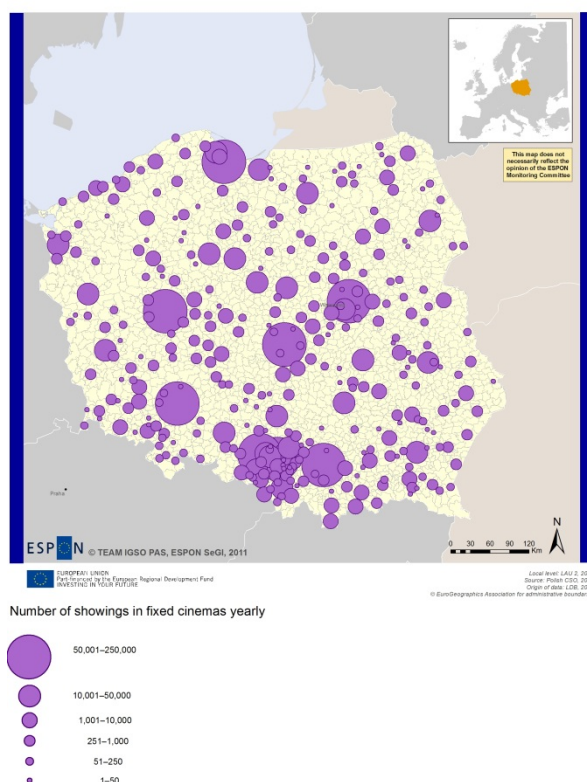
### Public administration

The administrative division of Poland has three-stages – the voivodeships (regions), counties and communes. At each of these levels of administration there are authorities elected every four years. The tasks of each of these institutions varies, but generally is based on the principle of subsidiarity, the individual tasks are performed by the lowest possible level of administrative authority in the hierarchy. The tasks of communes/municipalities includes, among others issues related to: spatial planning, communal estate management, environmental protection, nature conservation and water management, communal roads, water supply and sanitation, disposal and treatment of waste, maintenance of communal assets, landfill and municipal waste, supply of electricity, heat and gas, local public transport, health care, social assistance, municipal housing, public education, physical culture and tourism, markets, public order and public safety, family policy, cooperation with NGOs. The county's responsibilities include, among others: public education (secondary schools), health care (district and county hospitals), transport in the county, the care of county road network, dealing with unemployment (in each county functions local employment offices), defence, social care (in every county there are County Centres for Family Assistance).

## Cultural and recreational services

One of the most popular institutions in the field of culture and entertainment is cinema - which are in Poland much more common than theatres, galleries and museums, though less common than libraries or local cultural centres. In 2010, there were 438 cinemas in Poland (including 66% being under the responsibility of the local government). Nevertheless, compared to 1995, a decline in the number of cinemas was observed (702 in 1995, against 438 in 2010). There was, however, an increase in the number of rooms and seats. This is due to the construction of large multiplexes (currently in the country are 48 such, each with 11 screens on average) and closing of small art-cinemas. Distribution of cinemas, their size in terms of seats' number and displayed projection is directly related to the settlement structure of Poland, which means that the larger the town, the larger number of projections.

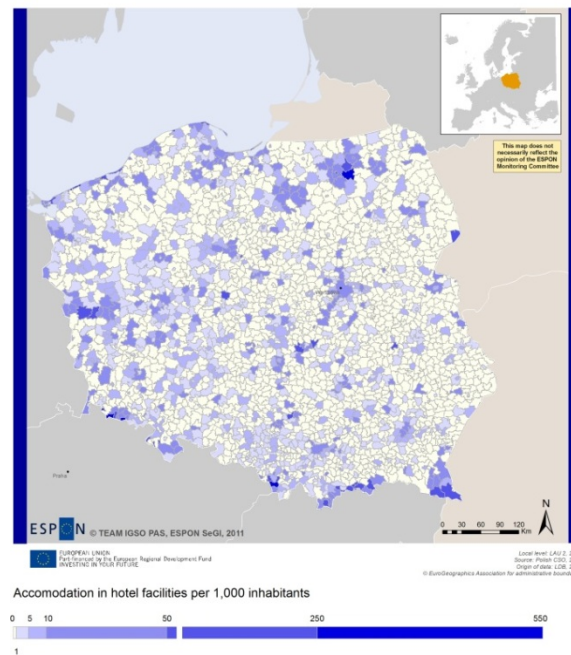
### Showings in fixed cinemas



An important part of cultural and recreational services are sports and leisure facilities. Specialized sports such as ice skating, indoor swimming pools (including water parks) and tennis courts are located mostly in the large urban centres - especially in regional capitals. The only objects that are commonly found in other sub-regions are stadiums and sport fields (including multi-functional ones). Accommodation facilities are located mainly on three types of areas - (1) in the large cities where tourism is developed in relation to cultural and entertainment activities, as well as business tourism, (2) along the main transport routes (mainly: motels), and (3) the most attractive tourist areas - mainly mountainous areas in the southern part of the country, in the northern part coastal zone and the lake district in the Polish Lowlands. Although in recent years there has been rapid development in the field of farm-tourism, however, these facilities are located usually in areas that due to their touristic attractiveness have already well developed accommodation possibilities.



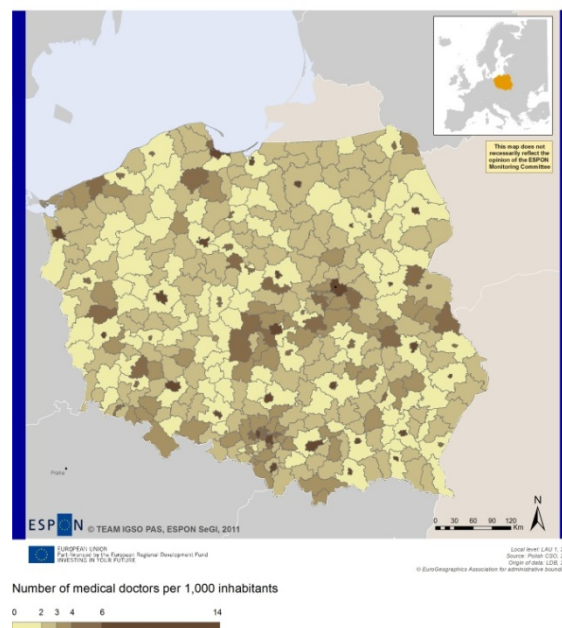
## Accommodation in hotel facilities



## Care services

Qualitative indicators of medical services and their availability in space (distance to health care) and time (the length of time waiting to see a specialist) are more emphasized than quantitative indicators (e.g. of medical staff) for evaluating care services. The second group of indicators (quantitative) like rate of medical personnel per capita is commonly used in the analysis of the national and European level (European Commission, the EU, Eurostat, ESPON). The highest saturation of medical personnel (including doctors and nurses) in Poland is characteristic of most large urban centres in the country. It is associated with the operation of specialist hospitals, provincial (the name is associated with the structures of the former administrative division), as well as private clinics. The immediate neighbourhood of these cities has a small number of health care institutions, as the inhabitants of these areas in a natural way use facilities located in the cities. Generally in the rest of the country, the level of saturation of the medical staff is quite balanced from 1 to 3 doctors per 1000 inhabitants.

## Medical care service



An important element in the provision of medical care at a basic level is the *Zakłady Opieki Zdrowotnej* (Health Care Clinics). In 2010, there were 16.6 thousand health clinics, and one in six was a private institution. In the last few years, there was a significant increase in the number of health clinics – in 2010, it was 30% higher than in 2004. The raise is related mainly to non-public clinics – within seven years, their number has increased by more than 5 thousand; rising from 8,7 thousand to 13,9 thousand. This was because the possibility of signing contracts with the National Health Fund (a government body of the Ministry of Health) was extended to private clinics, whilst it was previously exclusive to the public ones. The largest increase of non-public facilities was recorded in urban and suburban areas, where the greatest demand for such services is due to the high growth of migration rates in these areas.

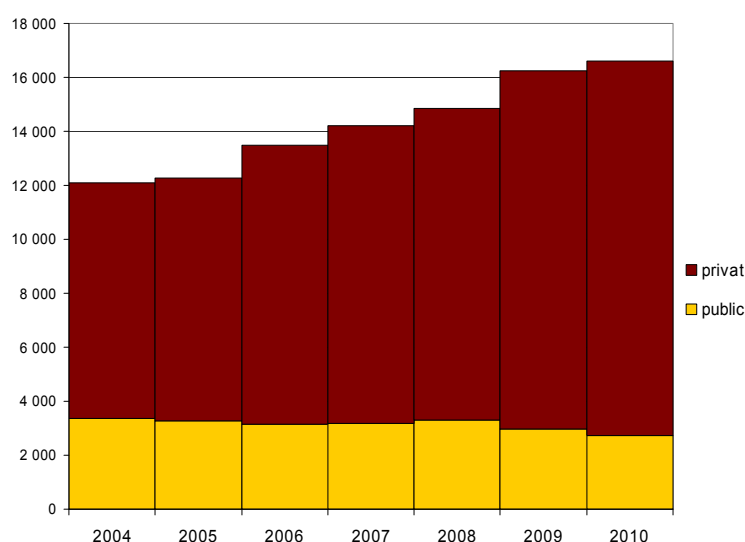


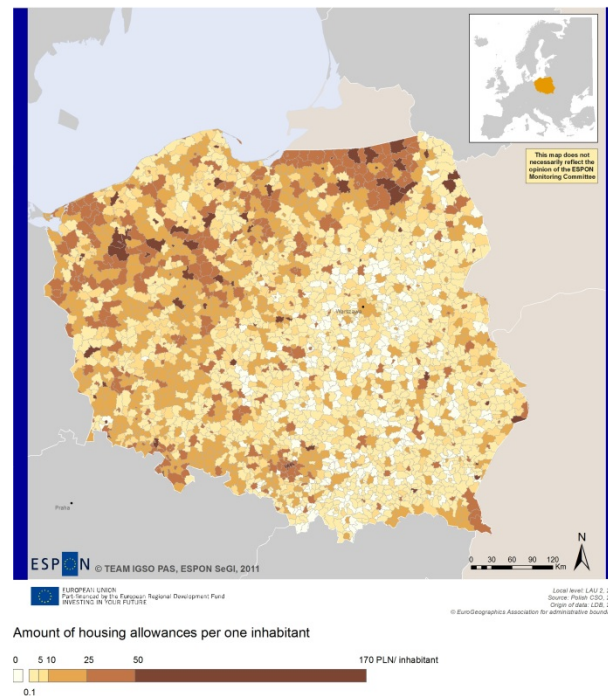
Fig. 3 Number of public and non-public health care facilities in Poland in 2004-2010

## Social care

An important task of local governments is welfare, for which in 2010 was spent more than 20 billion PLN, accounting for almost 1/7 of all expenditure of local administration. Social care is performed by municipal social welfare centres. Problems of social exclusion often affects the following groups: children and young people from disadvantaged neighbourhoods, victims of family pathology, persons with low qualifications, people living in difficult housing conditions, the sick and the elderly and the unemployed, especially the long-term unemployed.

One crucial element of social benefits is housing allowances, which are paid to those who are in the worst material situation – in 2009, nearly one billion zlotys was spent for this purpose. The highest amount of this sum was paid in the north-east and in the western parts of the country. These areas are characterized by the highest levels of unemployment. The unfavourable situation of these parts of the country was due to historical circumstances; for more than 40 years in the period 1950-1990 state farms existed in these areas. Their elimination in the first years of the socio-economic transition contributed immensely to social and economic stagnation. Modern forms of agricultural production resulted in a significant reduction in demand for labour, which in the absence of low professional skills and poor entrepreneurial behaviours of people living in such areas led to the emergence of poverty and social exclusion.

## Housing allowances



The high correlation of level of housing allowances and unemployment rates is also defining poverty. On the intra-regional scale, the situation in this regard is much worse in rural areas, especially the mono-functional rural areas, where poverty rates are three times higher than in major urban centres and their immediate surroundings.

### 3.Regional analysis of SGI

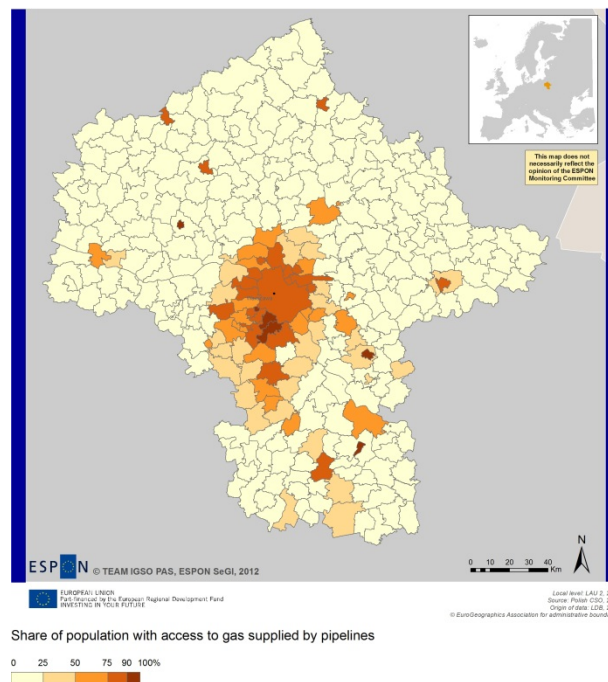
#### 3.1. Economic services of general interest

##### Gas

The development of local gas distribution networks is determined in the location of transmission networks in Mazowsze. The most extensive gas distribution infrastructure is located in the cities and communes located in surroundings of Warsaw (counties: piaseczyński, grójecki, grodziski and pruszkowski) and the individual municipalities spread across the whole region.

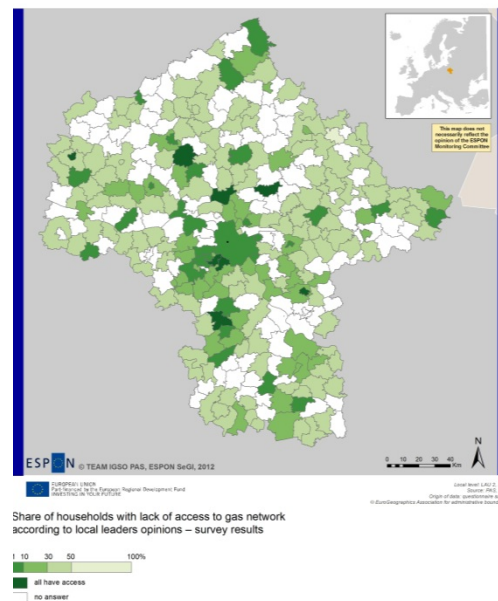
Near 47 % of communes in Mazowsze have a gas distribution networks. In another 15% of communes network is available only for every 10th inhabitant. Only 18% of communes in Mazowsze gas networks that satisfy the needs of more than half the inhabitants of the communes and in the ten municipalities (Błonie, Łomianki, Białobrzegi, Lesznowola, Garwolin, Pawns, Ilża, Raszyn, Tarczyn, Piast and Płońsk) the percentage of residents who use the local distribution network exceeds 90%.

##### Gas pipelines



The quality of local gas transmitting network installations in communes of Mazowsze is judged to be poor (50% of responses) or average (22%). A total of negative evaluation (bad and very bad) assigned to 67% the installations, the positive (good and very good) 11%. Only in 3.8% of municipalities all households have access to local distribution networks (mainly towns located south-west from Warsaw). The highest percentage of municipalities (59.6%) are those in which more than half of households is without access to gas networks.

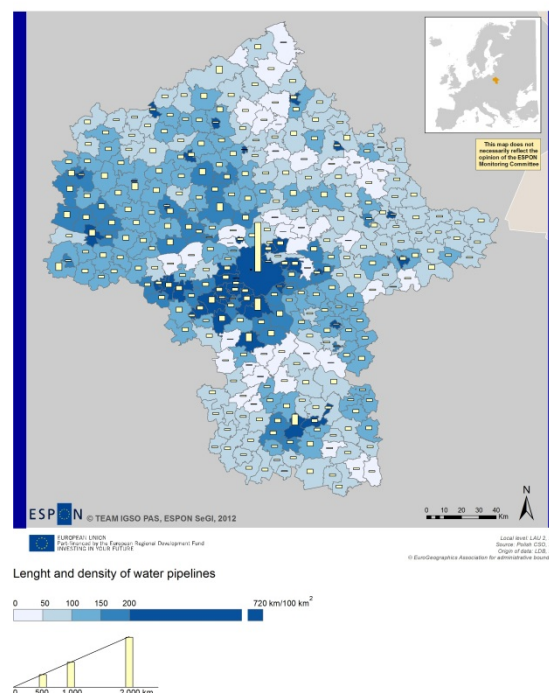
## Gas network



## Water pipelines

The density ratio of water supply systems is the highest in the communes centrally located (Warsaw and communes located south of the capital) and the north-western part of the region (sub-region plocko-ciechanowski) and county centers. The lowest density of the water supply networks is in communes located in the south (Pniewy, Błędów, Warka, Radzanów, Promna) and north-east (Krasnosioło, Łyse, Czarnia, Olszewo-Borki) part of the region and selected municipalities north of Warsaw (Poświętne, Klębów, Strachówka, Leoncin, Brochów). The longest water supply systems in the region are located in Warsaw and counties: Płock, Płońsk, Radom, characterized also by relatively high values of the density of the networks.

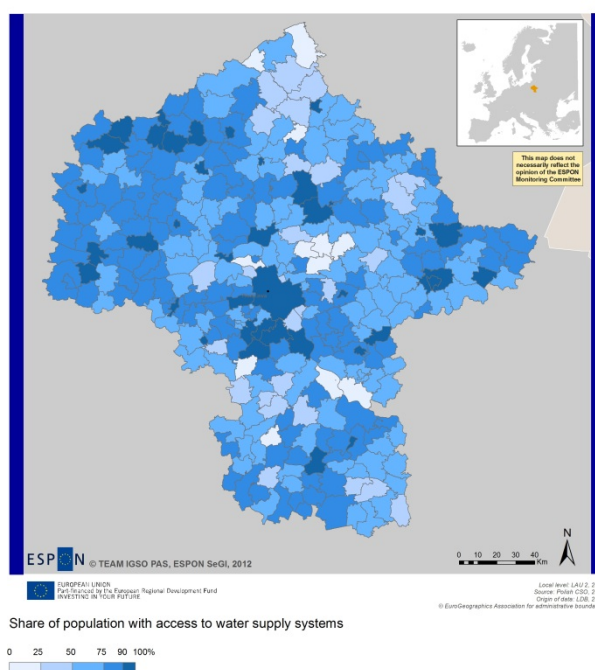
## Water mains



Already in 2002, only five municipality in the province did not have a water supply networks, and in 26 communes networks serviced less than 20% of the population. More than 70% of communes had water pipelines that provided access to water for more than half of the population, and only in every 10th village water supply networks used serve more than 90% of the population.

In 2010, as a result of investments made after the Polish accession to the EU and the new possibilities of investment financing of infrastructural facilities, water supply infrastructure has improved. Only three municipalities in Mazowsze (Poświętne, Strachówka, Czarnia) access to water supply had less than 1% of the population, and in the other eight communes the percentage of people having access to the water supply systems was less than 20%. The percentage of municipal water supply networks providing access to water more than half of the population has increased to 87%, and in 14% of the communes the percentage was over 90% of the population.

### Water supply system



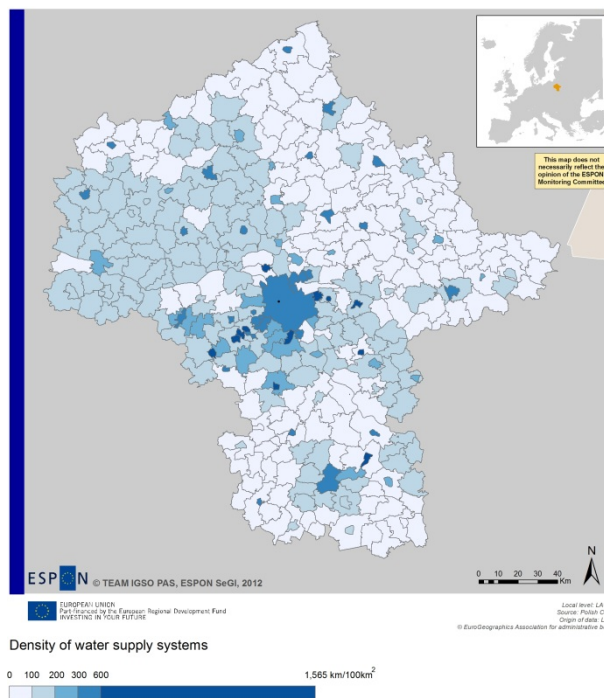
During the survey conducted among local representatives on the conditions of the technical infrastructure in the communes of Mazowsze the majority of interviewees assessed the quality of the installations, as very good or good (77% of total responses). Such assessments may be the result of relatively small the age of the infrastructure installations, the majority of cases the water supply systems are relatively new built within the last 20 years. The average mark was given to water supply installations in 19% of communes and as bad and very bad was rated installations in 3.1% of communes.

Only 9.5% of communes have declared that there is no need for construction, expansion or renovation of water supply in their community, these communes are scattered throughout the region. In about 7.6% of respondents declared that the water supply in their communities need repair, while 14.6% indicated the renovation and expansion is needed. The largest group of respondents (37.9%) identified the need for the expansion or construction of water pipelines on their territory, in most communities, however, there is only the needs for the construction of water supply systems, because respondents assessed that the existing water supply does not need to secure only 30% or less residents (except for only 14 municipalities in the western part of the county Grójec, northern part of county Białobrzegi and Ostrołęka where the existing water supply systems require a significant expansion).

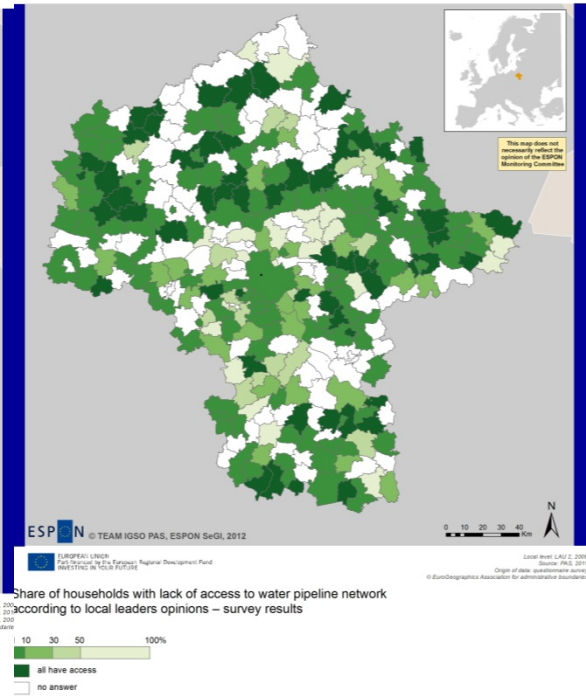


Answers to the question about the lack of access to water supply in the surveyed communes indicate that in the majority of communes (69%), more than 90% of households have access to water supply systems.

## Water supply systems



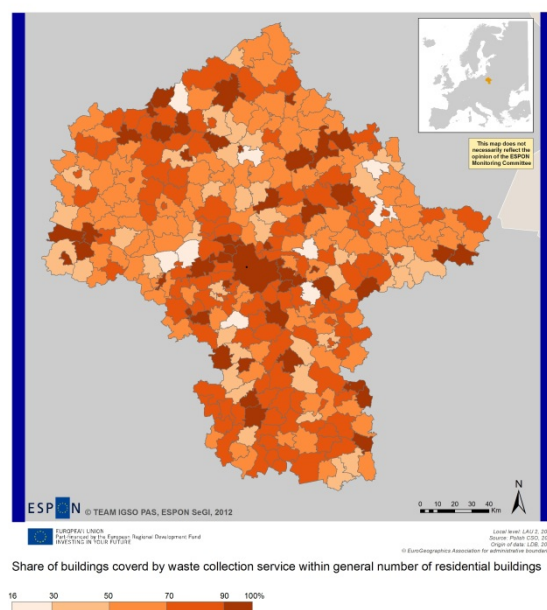
## Water pipeline network



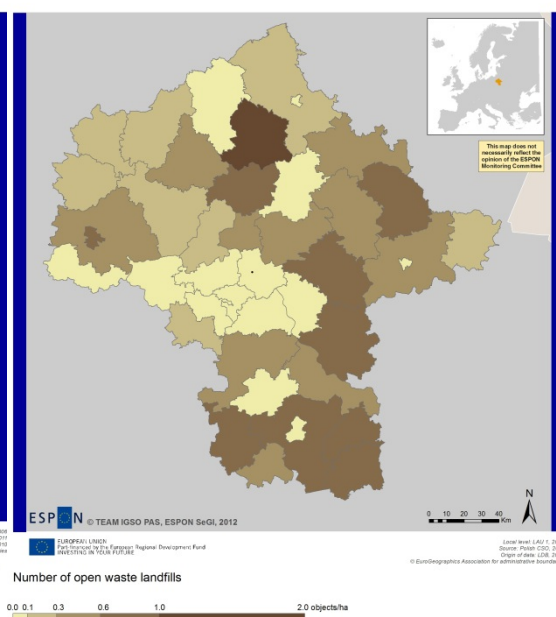
## Waste management services

In 2009 in the region operated 77 waste landfills (the total area was 288.2 ha). They were located in each of the counties, the largest number of them were located in the subregion ostrołęcko-siedlecki (28 landfills), with a total area of 82.7 ha. The largest landfill in the region were in the counties: Piaseczno (area 21.7 ha) and Otwock (20.8 ha).

### Waste collection



### Waste landfills



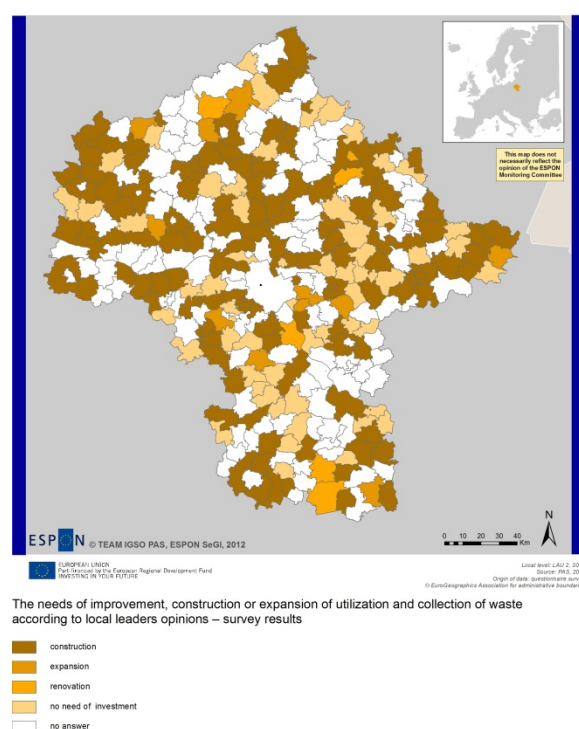
About 40% of landfills in the region are facilities whose size is less than 1 ha and usually support only one municipality. Existing landfill monitor collected waste, however those are not uniform activities: only 26 landfills monitors landfill gas, 46 monitors surface water and 82 groundwater monitoring results. More than 60% of the landfill does not have a sealed base and in result effluent is not discharged. In 2010 in the region was located 122 communal landfills.

Territorial unit	Open waste landfills	Surface of landfills
	no	ha
<b>Subregion - ciechanowsko-płocki</b>	<b>13</b>	<b>47.8</b>
County ciechanowski	2	4.8
County mławski	3	12.5
County płocki	2	4.0
County płoński	1	6.2
County sierpecki	2	12.1
County żuromiński	2	6.7
County m.Płock	1	1.5
<b>Subregion - ostrołęcko-siedlecki</b>	<b>28</b>	<b>82.7</b>
County łosicki	2	7.3
County makowski	4	3.7
County ostrołęcki	3	22.6
County ostrowski	5	11.6
County przasnyski	2	7.3
County pułtuski	1	1.1
County siedlecki	6	19.6
County sokołowski	1	1.6
County węgrowski	4	7.9
<b>Subregion - radomski</b>	<b>14</b>	<b>32.7</b>
County białobrzegi	1	1.2
County kozienicki	3	5.5
County lipski	1	1.1
County przysuski	1	1.0
County radomski	4	4.6
County szydlowiecki	2	5.5
County zwoleński	1	1.6
County m.Radom	1	12.2
<b>Subregion - warszawski wschodni</b>	<b>12</b>	<b>42.4</b>
County garwoliński	3	3.8
County legionowski	1	3.1
County miński	4	4.3
County nowodworski	2	8.7
County otwocki	1	20.8
County wołomiński	1	1.7
<b>Subregion - warszawski zachodni</b>	<b>10</b>	<b>82.6</b>
County grodziski	1	1.6
County grójecki	4	13.0
County piaseczyński	1	21.7
County pruszkowski	1	14.5
County warszawski zachodni	1	16.2
County żyrardowski	2	15.6

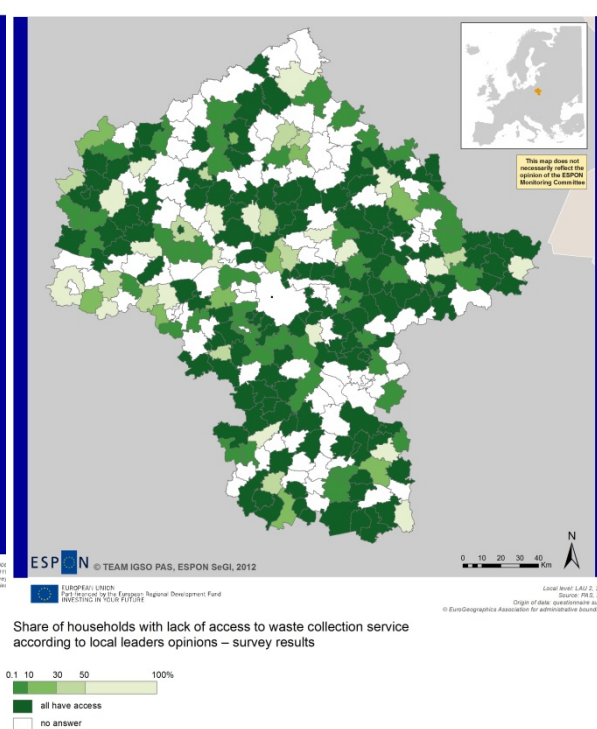


Services of waste collection are available to most households in the region. Only in 8.2% of the communes, this service is not available for more than half of the inhabitants of the municipality. These areas are scattered throughout the region, are among others in counties zwoleński (Policzna), łosicki (Stara Kornica), ostrowski (Górna Małkinia), ostrołęcki (Baranowo), pułtuski (Winnica and Pokrzywnica), sierpecki (Zawidz), gostyniński (Pacyna and Gostynin) and sochaczewski (Iłów and Młodzieszyn). However, in 59.3% of all communes the residents have access to this service. If to this group communes where only every 10th resident has no or limited access to the service will be added the rate will increase 82%.

## Waste collection



## Waste collection service

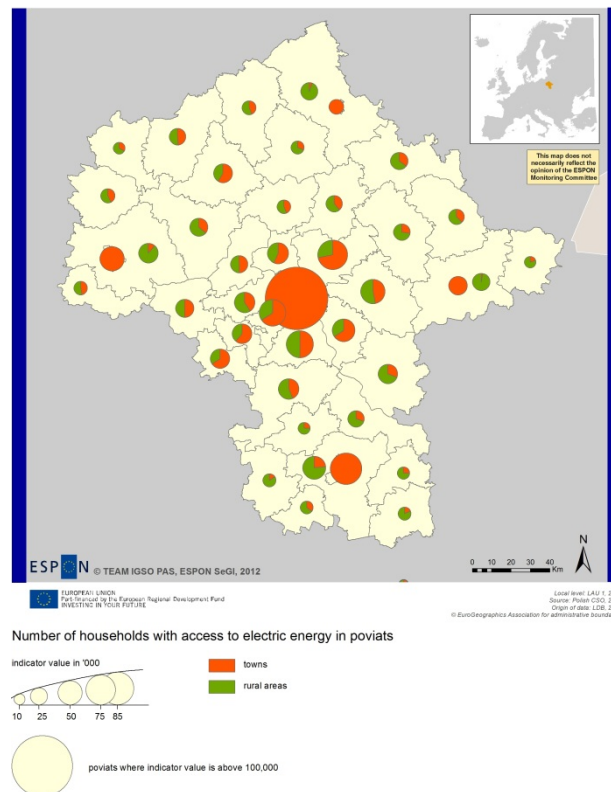


## Electric grids

Mazowieckie region is one of the largest consumers of electricity (second only to Silesia in the country), most of this energy is consumed in cities - especially in Warsaw. Unfortunately, today's energy balance (the amount of energy used in relation to the quantities produced) for Mazowsze is negative. In the region the main source of energy is coal, and the amount of energy produced does not meet the needs.

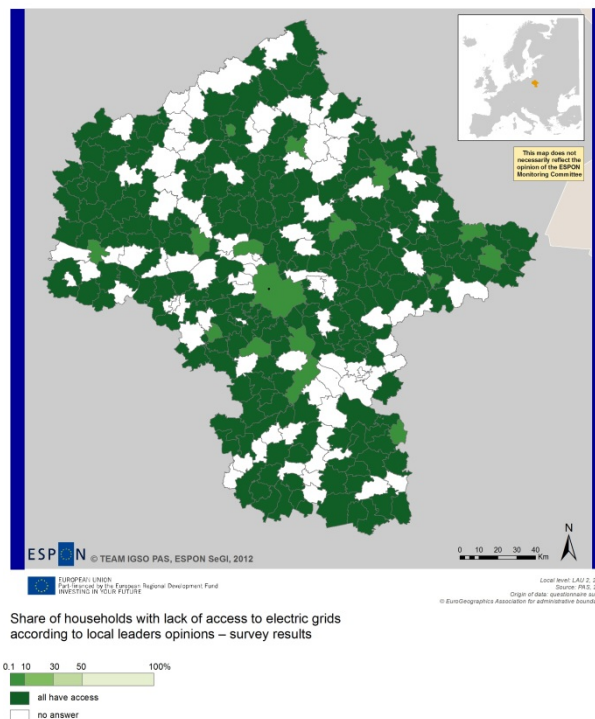
The development of energy networks in relatively small proportions depends on local government action, as for the construction and operation of this type of installation are the responsible companies providing electricity. Mazowsze communes have been fully electrified in the late 70th and 80, currently a electricity grids provide access to electricity to all residents of the region, with no significant differences due to place of residence (urban-rural).

## Electric energy



Another issue is the quality of the transmission grid. This problem applies particularly to rural areas, as the highest density of transmission lines occur in the Warsaw agglomeration. Slightly weaker development of transmission lines in the northern and eastern parts of the region can be observed. As many as 1/3 of electricity networks require repair or replacement, as existing installations were built 35-40 years ago and do not provide the quality and security of transmission.

## Electric grids



According to survey in more than 45% of communes network quality is poor or very poor, and another 42.08% this quality is judged as average. Only 11.2% of the communes in the power network is assessed as good and very good. These communes are spread all over the region. The fact that they are spatially clustered, indicate that the assessment of the quality of the network dependent on the elements of local transmission.

Among the requirements in relation to the electricity networks declared by representatives of local government the first place takes the need for the construction, expansion or renovation of an existing networks (46.1%). The need for repairs only 16.2% and lack of needs declared 5.4% of the respondents – there were the mostly rural communities in the northern part of the region.

## Postal service

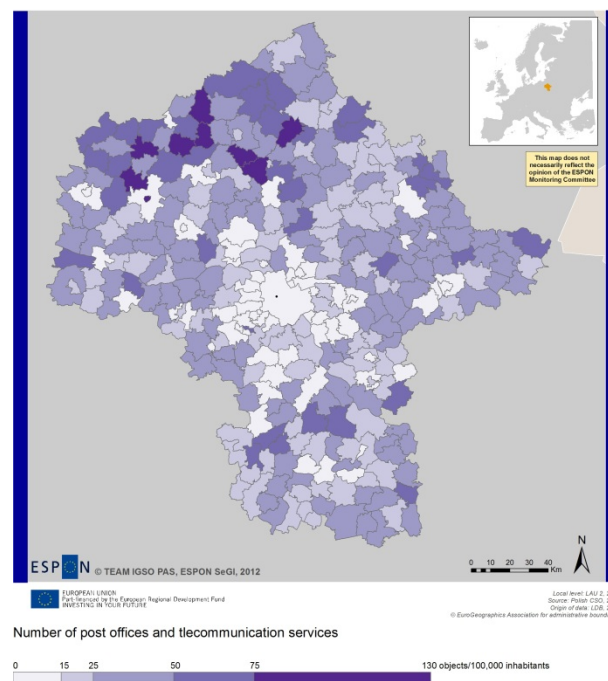
Polish Post (Poczta Polska) is the public postal operator in Mazowsze, it means that it is legally obliged to provide the universal postal service (for whole region and country). The main duty is to accept and deliver:

- letters up to 2 kg,
- packages up to 10 kg (packages shipped overseas may weigh up to 20 kg),
- mail for the blind,
- postal money orders.

In addition on request of the sender has to treat the letter as certified mail, letter or package, provide acknowledgment of receipt and give parcels and money orders for general delivery.

The Polish Post Office is required to maintain a certain provisions of the postal network (at least one post office per 7 thousand people and at least one office for each 85 km<sup>2</sup> in rural areas), as well as keep minimum quality standards requirement in providing the service. The public operator cannot refuse the universal postal service to anyone, unless that the person does not apply to the rules of Polish Post.

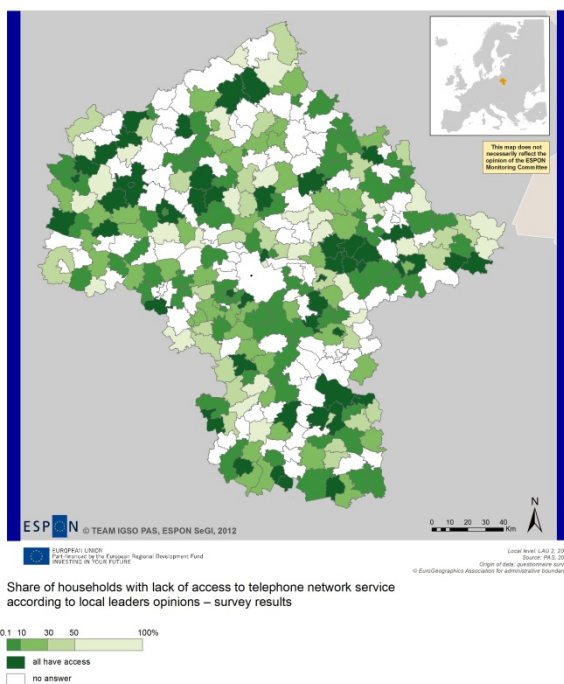
## Postal and telecommunication services



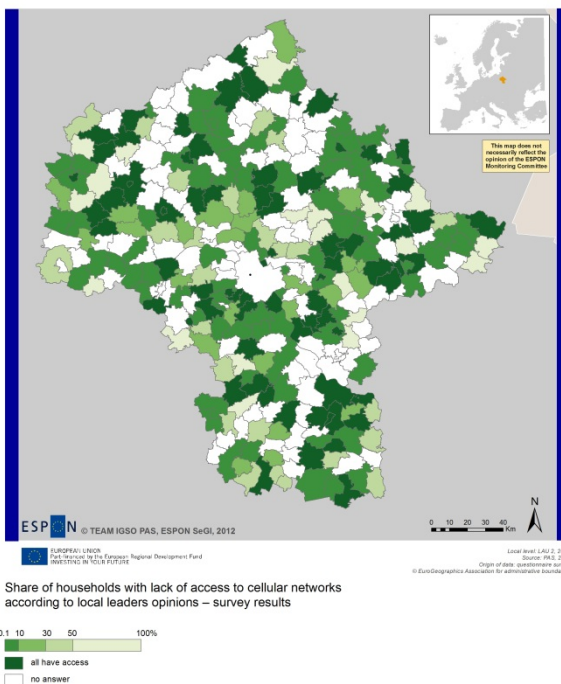
## Telecommunication services

In 2010, an average of 100 people living in the Mazowsze region, there were 19.3 fixed-line phone subscribers, it is more than the average for the whole country (15.4 subscribers per 100 people). Clear dividing line in the case of fixed phone network provision runs between rural and urban areas. With cities having 24.2 subscribers per 100 residents, while in rural areas only 10.3 subscribers per 100 inhabitants, this result is only slightly higher than the national average for rural areas, which is 9 subscribers per 100 people.

### Telephone network service



### Cellular networks



A survey conducted among representation of local officials referred to the issues related to the telecommunications infrastructure in three ways. First question was addressed on the quality of the network. The quality of the fixed telephone network was assessed as very good or good in 74% of communes. The quality of the cellular network at the same level was assessed up to 80% of the responses.

The second aspect covered in the survey concerned the share of households that do not have access to telecommunications networks. The percentage of households where access to the fixed telephone network is not more than half the population, is in the among surveyed communes is 15% in the case of cellular phones 10 %.

The last aspect of the tested was need for construction and expansion, only repair, construction or expansion and renovation or the lack of need for investment. In case of fixed-line phone network 45% of responses indicated a need to further construction and development. Just over 8% of municipalities indicated only repairs. The need for expansion or construction of a cellular network, expressed more than half of communes.

### 3.1.1. Detailed Analysis of selected economic SGIs in Mazowsze

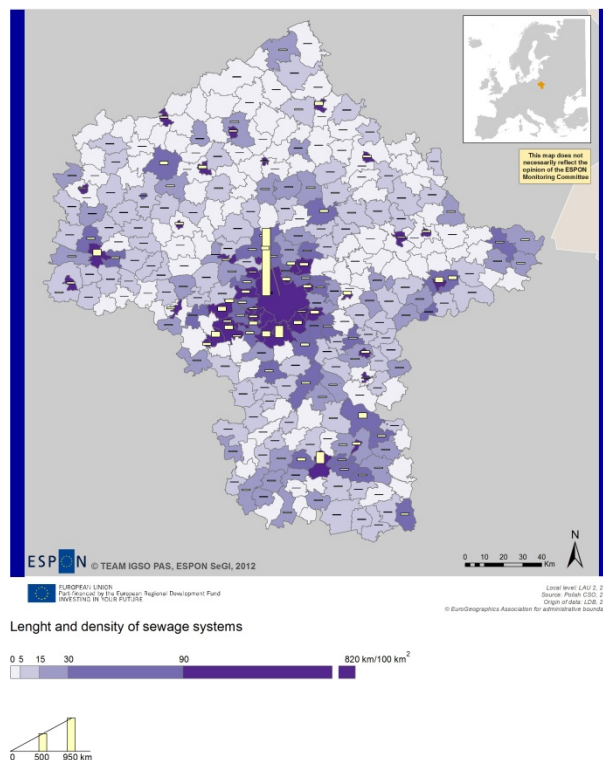
#### 3.1.1.1. Sewage systems & sewage treatment facilities

Sewage networks is complementary for water supply networks, unfortunately the development of the sewage networks in Mazowsze does not match the dynamics that can be observed in the case of water supply networks. Local authorities a relatively fast started catching up in infrastructure disadvantage, but first investment efforts focused was on water supply networks. It was dictated by the need of securing both the quality of water used in households, as well as economic factors - construction of water supply was much cheaper than building a sewage network.

In the early 90s sewage systems were located mainly in urban areas and relatively rarely occurred in rural areas. However, even these networks, which occurred in the cities satisfied needs only a part inhabitants and required further development. Most households in Mazowsze in both urban and rural areas used to use sewage tanks.

In 2002, 35.9% of the municipalities of Mazowsze there was no sewage network (in this group, there was only one town Wyśmierzyce rest communes were villages), in further 23.1% sewage networks serviced only one every tenth inhabitant, in 18.3% of the municipalities the rate grow between three and five out of ten inhabitants. More than half of the population could benefit from the water supply only 15.3% of the municipalities, but only in four municipalities (Siedlce, Pawns, Warsaw and Kozenice) sewage networks provided service for over 90% of the population.

#### Sewage systems

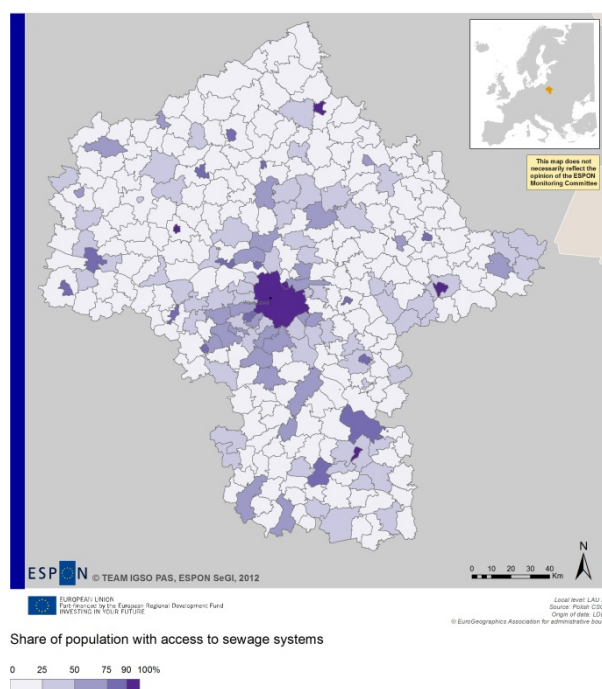


In 2010, still without sewage systems remained in Mazowsze 25% of communes. They were the only rural communities or rural areas in urban and rural communes. It should be noted, however, that

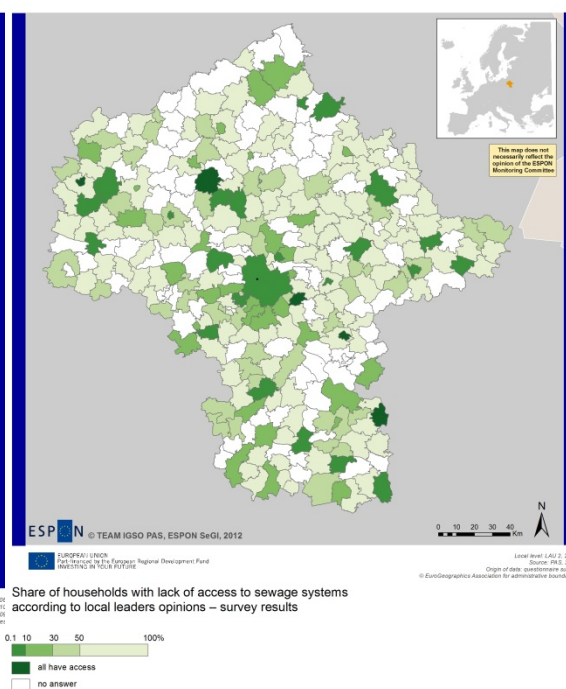


compared with 2002, the group of communes was reduced by 10%. Decreased the group of villages, which provided service only for 10% of the population (ie, municipal sewage systems which focused on a very small area (usually the commune center), in 2009 it accounted for 12.6% of the total communes of the region. Increased in the group of communes where sewer systems provided services for 10-30% of the population (27.95% of communes) and communes, where more than half of the population was served by the network (21.7%). Municipalities where more than 90% of the population could benefit from the sewage network were still few in number, in whole province it was only 9 of them in 2010 and they were almost only large and medium-sized towns (the exception was the community Pionki).

## Sewage systems



## Sewage systems

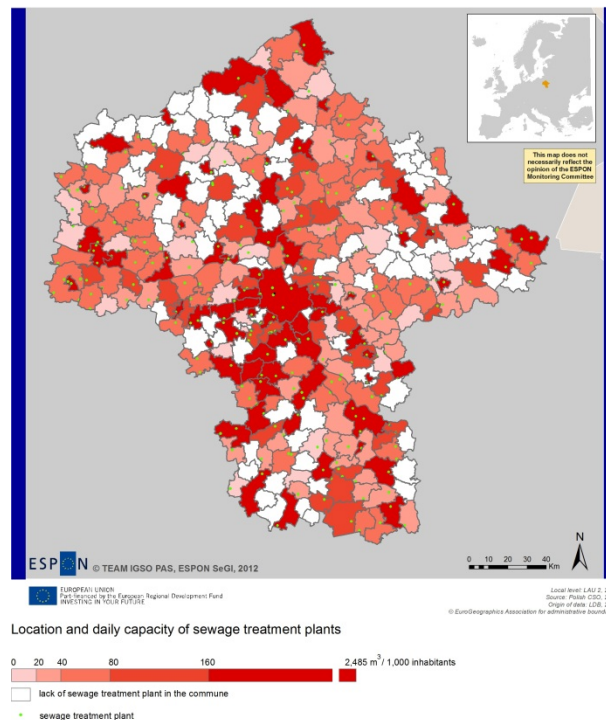


Both the density and length of sewage networks in Mazowsze were a much smaller than the length and density of the water supply systems. Clear differentiation between urban areas which were characterized by relatively high levels of density and rural areas which were characterized by low values of the indicator, or even the lack of sewage systems. Concentration of communes with the highest values of the indicator, both in terms of density and length of the sewerage system, can be observed in the central part of the region (Warsaw and its zone of influence, particularly for communities located south and southwest of the city), Płock and its surrounding on the west of the region, and Radom with its suburban zone in the south.

As in the case of sewage networks, sewage treatment plants occur mainly in urban areas and in areas that are characterized by a highly develop sewage network: Warsaw and its surroundings - mainly municipalities south of the capital city and county municipalities. Relatively less sewage treatment plants can be seen in the county of Radom, where sewage systems were characterized by a high rate of density. There is also visible area of significantly higher than average density of sewage treatment plants, those are communes located in the western part of the county Grójec (Mogielnica, Belsk Duży, Pniewy).

Another issue is the daily capacity of the plants. In most cases, these are relatively new objects created in the last 15 years, so they are able to meet the local demand. Older buildings, which were built in the 80s, underwent a major refurbishment, which increased their capacity. Generally local authorities try to increase capacity and where it is not possible to invest in new treatment plant.

## Sewage treatment plants



### 3.1.1.2. Transport

#### Road transport

In 2010, the total length of roads in the Mazowieckie voivodship was 50.4 thousand km, of which there were 2.4 thousand km were country roads, 3.0 thousand km of regional roads, 15.1 thousand km county roads and 31.9 thousand km of communal. The density of roads per 100 km<sup>2</sup> was 147 km, which was the higher rate than the national average, but lower than those recorded in the southern Polish regions. Improved surface had more than 31 thousand km of roads. At the same time the Mazowieckie voivodship has the highest (next to the Wielkopolska) motorization rate (500 passenger cars per 1000 inhabitants in 2010).

There are three main road routes that pass through the voivodship: Cork-Berlin-Poznań-Warszawa-Minsk-Moscow-Omsk, Prague-Wrocław-Warsaw-Białystok-Helsinki and Pskov-Gdańsk-Warsaw-Kraków-Budapest.

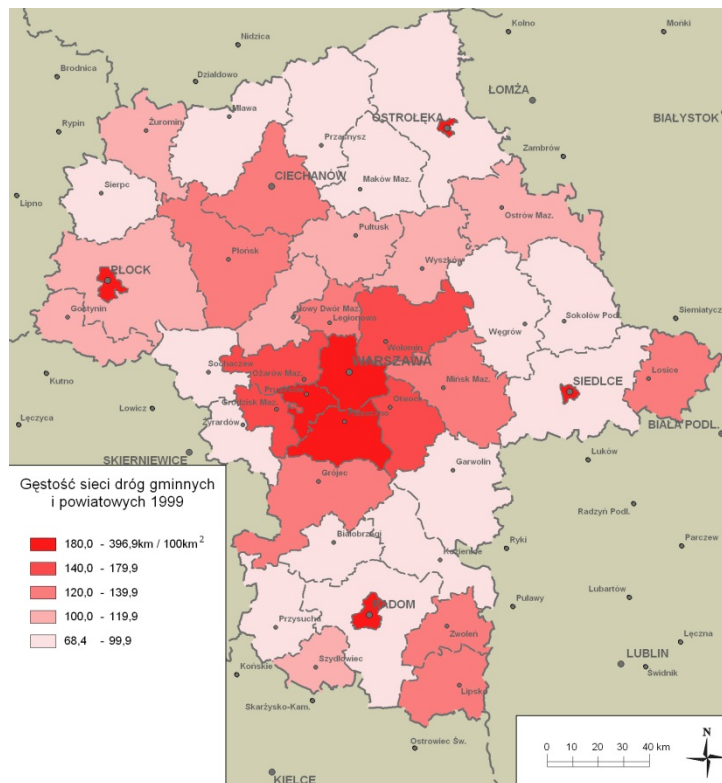
The A2 motorway is the first freeway to connect the region, and therefore the capital city, with the rest of Europe, entering to the region from the west and stopping in Warsaw. The freeway will pass directly through the voivodship from east to west connecting it with Belarus and Germany.

Basic layout of the main roads in the region (national and provincial) is the most consistent. Accessibility analysis shows however there are several missing links in the system. These are primarily:

- Full Warsaw motorway ring road, which determines the accessibility of virtually the entire eastern part of the region (as well as the accessibility of Podlaskie and Lublin regions);
- New express road sections, particularly in the direction of Białystok (S8; bypass Marki), Krakow (S7), Katowice (S8) and Gdansk (S7; bypass Łomianki);
- Crossing bridge over the Vistula River (including commuting) in the area of Solec, Kozienice, Wilga, Konstancin-Jeziorna and Łomianki;

- Road Wyszaków-Ostrołęka;
- passes along some roads not currently expected to change the standard on the expressway (including Ostrołęka, Góra Kalwaria, Północne Siedlce).

At the local level is a key road infrastructure at lower levels, the county and communal roads. Their distribution is highly varied in space. In general terms, however, it refers to population density. Already in 1999 in addition to Warsaw metropolitan area networks of north-western part of the province were characterized by higher density. Subsequent years brought little alignment of the gap mainly through the development of networks in the western and southern parts of this region. Clearly lower saturation of local roads stayed in the eastern part of the region, especially in the counties of siedlecki, węgrowski, sokołowski, ostrołęcki, makowski and przasnyski.



In the years 1999-2009 the largest increase in the density of local roads took place in the sub-regions of western Warsaw and the eastern Warsaw, followed by the Radom. The other two sub-regions (including the least equipped in road infrastructure siedlecko-ostrołęcki sub-region) density did not undergo significant changes.

In fact, about the development of the network decided modernizations, including construction of a new or replacement old surface on county and communal roads. The scope of these investments was significant. They were performed both on the basis of own resources of local governments, as well as the use of external funding (national and European Union structural funds). In some counties significant importance had funds flood (especially in 2010). In the case of county roads 5-30% were modernized in the last five years. The positive effect of this favorable trend, however, was limited by the following facts:

- Excessive fragmentation of investment, difficulties in communication between adjacent units;
- Replacement of the surface was not guaranteeing the sustainability of investments especially in context of road use by heavy goods vehicles;
- lack of complementarity of investments carried out on national and regional roads which makes that sometimes heavy transit traffic from the main road were directed to lower level road.



## **Railway transport**

Mazowsze railway infrastructure system is even more dependent on historical factors than in the case of road infrastructure. In the transition period (after 1989) in the region has been opened only one new railway line 2 kilometers line connecting Warsaw airport Okęcie with railway network. Last major investment before that was the construction of the Central Railway Line in the direction of Krakow and Górny Śląsk in the 70's of the twentieth century. At the same time a number of railway lines were closed, or suspended.

In 2010, the length of railway lines in Mazowsze was 1,683 km, of which 1,016 km were double track and 1412 km electrified. Simultaneously, the network density per 100 km<sup>2</sup> was 4.7 km and was one of the lowest in the country. However, its high average level was largely derived from high density within of tracks within in Warsaw (18.8 km per 100 km<sup>2</sup>). Indicators for the other regions were abnormally low (e.g. 1.9 km in the subregion ostrołęcko-siedlecki). Seven counties were completely lacking railways. They were located mainly in the northern and south-eastern part of the region. The highest density of was observed in the central zone of Mazowsze.

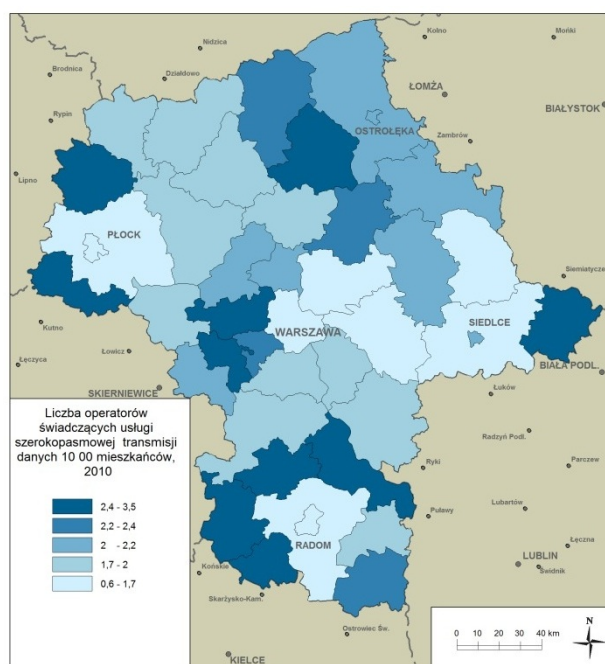
At the moment, the most important lines are intersecting region are routes: E20 (Berlin and Poznań to the border with Belarus with a bypass for freight traffic from Łowicz CE20 through Góra Kalwaria to Łuków) and E65 from Gdansk via Warsaw and on the Central Railway Line in the direction of the Upper Silesian conurbation . Both of these passages are concentrating most current investments in rail transport in Poland. In addition, an important role is played by lines E75 (from Warsaw to the Lithuanian border, part of Rail Baltica, which is a priority for the European Union transport) and line 8 from Warsaw to Radom and Kielce. Both of these routes are repaired only on sections adjacent to the capital. In the latter case, the focus is on a distance that connects the capital city of Warsaw and Okęcie airport. With the use of the European Union's funds the second phase of modernization of the railway line Warsaw-Łódź (section within the Mazowieckie voivodship) is implemented. Modernization investments, however, are not carried out between Warsaw and Lublin and Kiev, which is one of the biggest bottlenecks Mazowieckie railway system (single-track section Otwock-Pilawa).

Passanger services on railway infrastructure in the region is provided by two carriers Koleje Mazowieckie (with subvention from regional government) and PKP Intercity (state own railway company).

### **3.1.1.3. Broad-band/Internet**

In total, in the Mazowsze region broad-band Internet connection in 2010 was provided by almost 200 operators'. Most of them in absolute terms (apart from Warsaw, where 109 operators provide this service) in the county of Pruszkow (36), Piaseczno (31) and Wołomin (29). It can be noticed that the smallest choice of Internet provider have the inhabitants of the counties located around the cities and towns, such as Plock, Siedlce, Radom, as well as county sokolowski and miński. Least IP numbers per 10 000 inhabitants is located in counties of eastern and south-eastern part of the region.

The largest of Mazowsze internet provider Poland PTK Centertel Sp. of o.o. operates in 301 communes (other operators provide access to Internet are: Telekomunikacja Polska – 295 communes, Netia SA - 288, Sferia SA 131), and 99 providers offer Internet access only in one commune. The largest selection of operators' have inhabitants of Warsaw. Internet is offered here by 109 companies. In other communes this number is almost 4 times lower (Pruszków - 24, Siedlce - 24, Grodzisk 22, Radom 2, Nadarzyn 22, Piaseczno 22). Only in commune Radzanów (district mławski), there is a provider of such services. The average for the region is 7 companies offering broadband Internet access per commune. Considering the spatial distribution one can notice that among the cities with county rights Ostrołęka has the lowest number of providers.



## 3.2. Social services

### Education

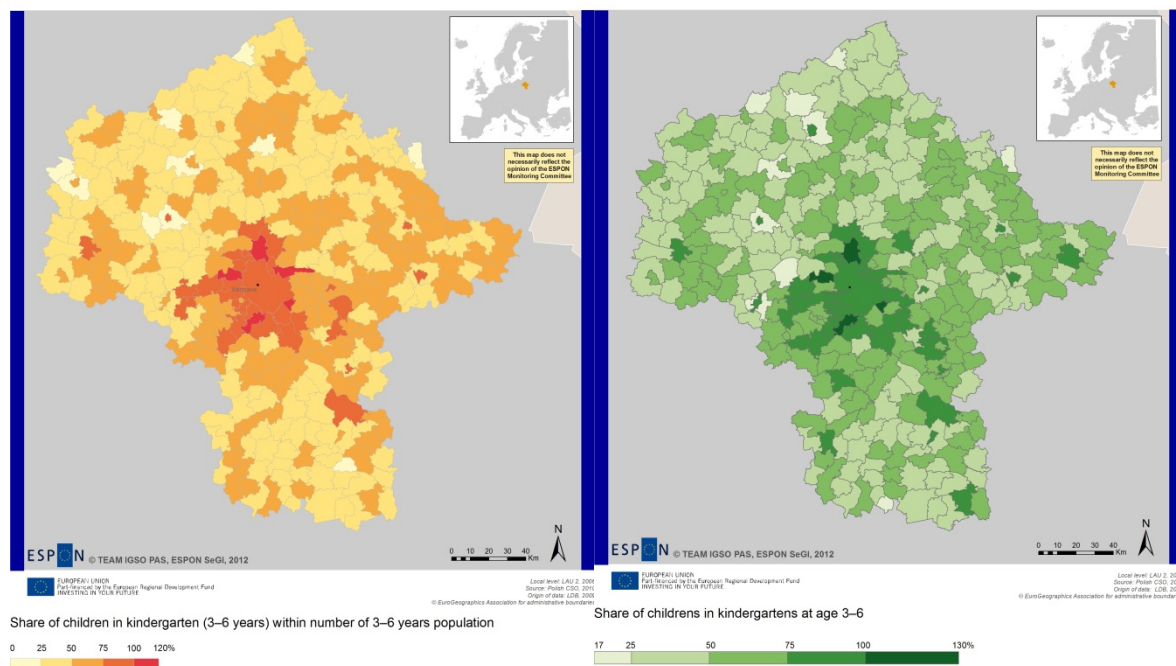
Nurseries are the initial stage of children care. In 2010, there were 68 nurseries in the Mazowsze region with more than 5.3 thousand places. Typically, children in day care centres have one or two year old (91% of the total). Of the 68 institutions in Mazowsze in Warsaw operated 53 such facilities (78% of the total), and therefore clear spatial concentration is visible.

Kindergartens are the first real stage of education, which is implemented in kindergartens and pre-school classes in primary schools (classes are mandatory for children - one year before primary school). The access to kindergartens is described by the participation rate of children in pre-school/kindergarten education. The indicator expressed a percentage of children attending pre-school or kindergarten unit attached to primary schools in the total number of children 3-6 years. An important advantage of the indicator is its complexity, because on the one hand it shows saturation level of child care facilities, on the other hand also indicates the level of schooling among the youngest group of children in the education system.

Overall, rate of preschool enrolment in Mazowsze reached 71% in 2009. The distribution of these values is very different depending on the functional structure of individual municipalities. The highest percentage of children attending kindergarten is in Warsaw (94%). Also, a high proportion has areas located in proximity of Warsaw. In this area in the last 10 years a number of private kindergartens was opened in which obtain funding from the EU. The lowest value of the analysed indicator is observed on peripheral areas of the region. A clear polarization of the level of participation of children in pre-school education is noticeable. The sharp increase of indicator values within last few years is comparable to Western European countries took place in Warsaw and its suburban area and other major urban centres of the region. On the other hand, on peripheral rural areas, stagnation in kindergarten provision and increase of the gap to the more urbanized areas is observed. Currently carried out initiatives to support the founding of private kindergartens is limited almost exclusively to large cities and suburban areas. In rural areas, the investment risk is much higher, so founding private kindergartens is sporadic.

### Children in kindergartens

### Kindergartens





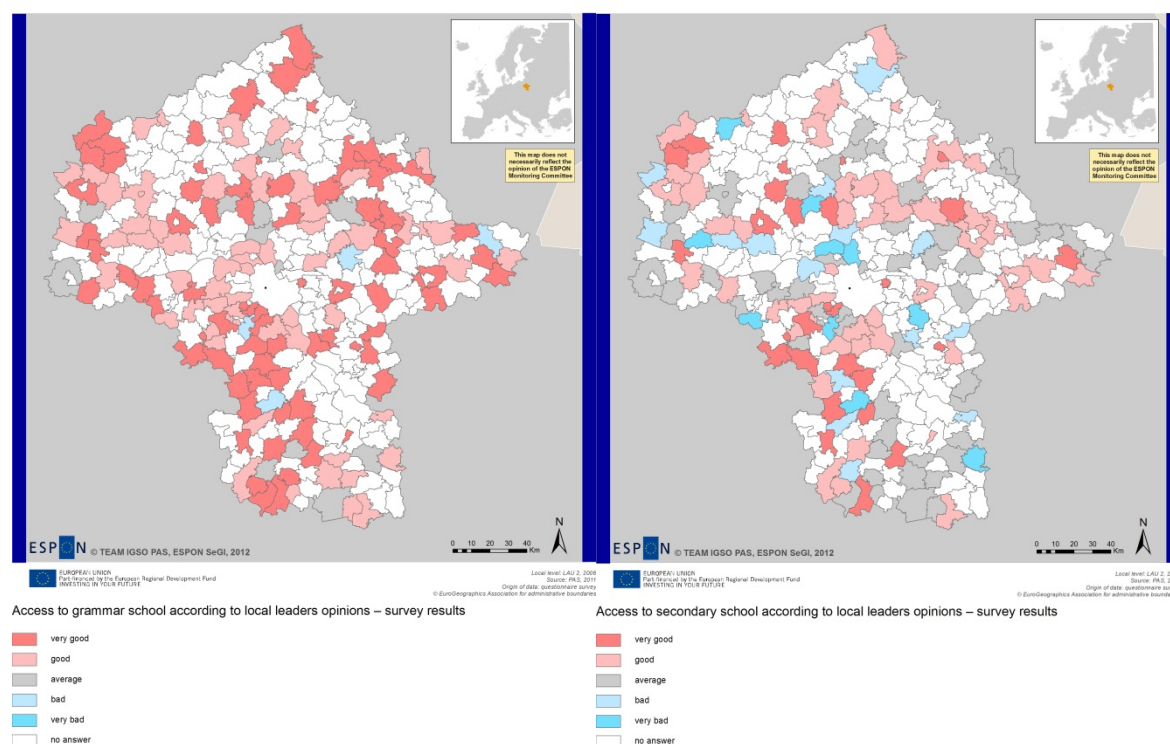


The surveys carried out in the communes of the region shows that in 96% of them children are brought to school by car, including every third of the local government which runs a shuttle service beyond the statutory obligation and includes additional categories of children. Very interesting results were provided by the analysis of the percentage of children brought by buses to school (and kindergartens) depending on the type of function of communities. The largest share of pupils brought by bus is in agricultural communes peripherally located. In this type of communes three out of four grammar school pupils must commute in order to receive education. This is because an average of 1.4 schools per community operates on in these communities. It is usually located in the centre of commune. On the other hand, in the municipalities of the suburban area of Warsaw, where on average there are 4 grammar schools per municipality, only is only every 10 students has to commute. The best situation in this respect is the sub-regional centres of the region and Warsaw. A slightly lower percentage of pupils commute to primary schools - due to the fact that on average in the commune there is about five primary schools.

A major challenge which are currently facing the primary and grammar schools are unfavourable demographic trends which cause the decrease in the number of children of school age - although due to the increase in the birth rate since 2003 is expected to slow down or even a slight reversal of the negative trend in the next few years. Throughout the period of 2001-2009 in Mazowsze the number of pupils in primary and grammar schools felt by 20%. The most affected by this process were sub-regional and district centres as well as rural communities. In Warsaw suburban areas, which are characterized by the largest influx of migration, mostly young people with children, the decline of students does not exceed 10%, and in 2009 there was an increase of their number. These processes generally result in closing schools - however if the number of students in the 2001-2009 period felt by more than 20%, the number of schools has decreased by 12.5%. As a result of the average number of students in the school has decreased. Unfavourable demographic trends in peripheral areas have significant implications for local governments. The decrease of the number of students at schools is resulting in the reduction of educational subsidies and the in need of financing schools or children delivering services within their own funds. The local urban or suburban communities have much greater financial resources for schools due to the higher average number of. This issue is an example of polarization of educational situation in Mazowsze - the possibility of financing their educational tasks are at different levels for municipalities located centrally and peripherally.

## Grammar schools

## Secondary schools



The findings of the analysis based on statistical data were confirmed in the opinions expressed by representatives of the local government. Assessment of the spatial availability for different levels of education varies significantly. The best spatial availability characterized the primary and grammar schools - such high rating is due to the fact that they are located in each municipality and in most cases, not only in the centre of commune. The availability of kindergartens was rated lower, due to the previously described lack of these facilities to the rural areas of the region.

## Labour market services

Raising professional skills decides about the success in the labour market. Mazowsze is a leader in terms of share of people learning and increasing their skills in the age group 25-64 years (7.3%). Although this is a lower figure than the EU average (9.3%), it is much higher than in other Polish regions.

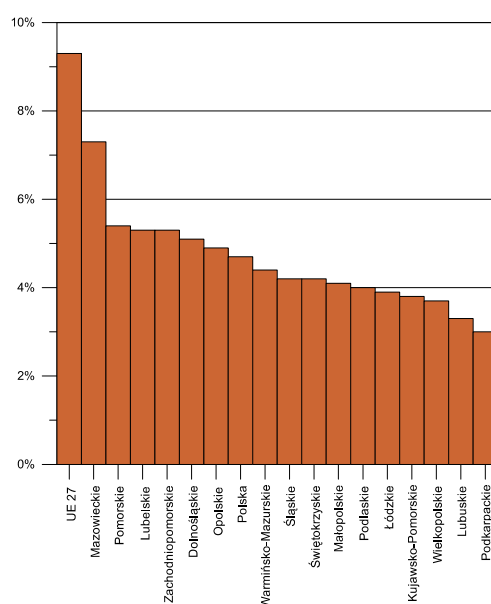


Fig. X The share of people increasing their skills in the age group 25-64 years in 2009  
Source: EUROSTAT

Different types of training courses are organized by the District Labour Offices located evenly in the region (in each of 42 districts). However, also a number of private institutions is leading such activities commercially. In Mazowsze there is operating more than 1,500 training companies - of which in Warsaw operate almost 800, which represents 55% of all group. Another 15% is located in the sub-regional centres (Radom, Płock, Siedlce, Ostrołęka, Warszawa), 10% is located in the suburban zone of Warsaw - this is clearly visible on the map. The smallest number of training facilities occurs in the suburban area municipalities and sub-regional centres and in peripheral areas (mainly rural). This situation from the perspective of the structure of the region and the spatial differentiation leads to the conclusion that an important factor influencing the development of such facilities is demand (larger population, larger population density and more options for companies considering premises, equipment and staff. Large cities and their immediate neighbourhoods enable acquiring students/customers and staff that will be able to conduct courses and training. Areas with lack of ability of benefiting from training facilities are disadvantaged - on the one hand they are mostly areas with low human resources (in terms of quality), on the other hand, there is no institution that can offer the increase of qualifications. Therefore it can be concluded that the ongoing polarization takes place in adult education. Residents of Warsaw and its suburban areas and several large cities of the region have on the one hand the best education, and on the other access to the largest number of training institutions. Thus, residents of these areas have the greatest opportunities to improve their skills and increase their potential in the labour market. On the other hand, in addition to the above-mentioned conditions associated with the development of this facilities in the central region (such as infrastructure conditions, supply and demand for staff training on the part of residents and businesses), it should be noted that the development of Warsaw generates a demand for well-

educated workers who can adapt to changing conditions. So is the general economic situation of Warsaw Metropolitan Area is stimulating the creation of new training institutions.

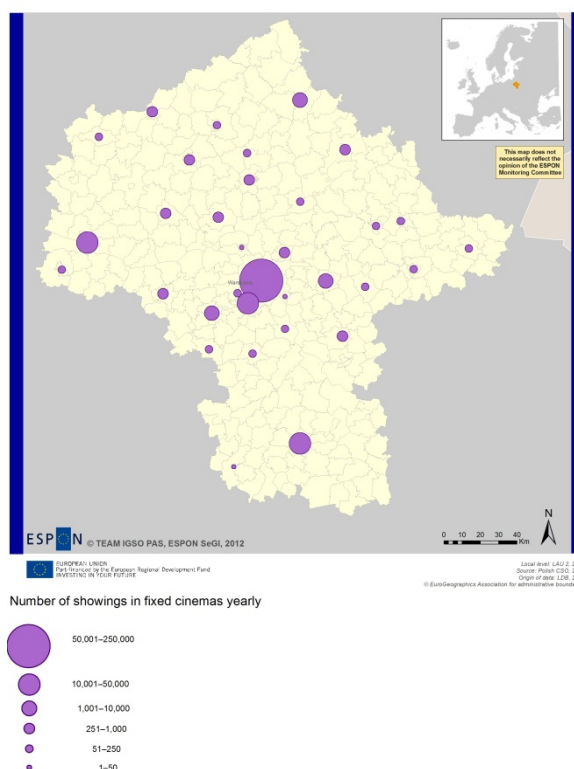
### Cultural and recreational services

In 2010, the Mazowsze there were operating 24 theatres, 22 of which were based in Warsaw, and the other two were located in Płock and Radom. In addition in Warsaw, there is only one Philharmonic Hall and two chamber orchestras and symphony orchestras, and in Płock and Radom one per city. In 2010 all performances and concerts gathered over two million viewers (of which almost 1.9 million in theatres). In general, an increase in the number of viewers in the theatres in the last few years can be observed. The level of participation of people in the region (mainly in Warsaw and immediate surroundings) in theatre and music events is almost two times higher than the total in the country - this is due to the richer cultural offer and larger number of shows and concerts, as well as a higher level of local government income that can be spent on goods of higher order. In addition, in Mazowsze operate 64 galleries, including 50 in the capital of the region and 115 museums, 61 in Warsaw.

Much more popular cultural institution in the region are cinemas. In 2010, there were 56 cinemas (about half under the government responsibility, and the other half private). Compared to 1995, can be observed a steady trend decline in the number of cinemas (in 1995 there were 78), while the increase of the number of auditoria and seats. This is due to the construction of large multiplexes (now in Mazowsze are 10 such objects, with on average 11 auditoria) and closing small art cinemas. While in 1995 the average cinema in the region had more than 800 seats in auditorium, current average is 5.5 thousand. In Warsaw alone, during the last fifteen years 12 cinemas were closed.

Cinemas in Mazowsze are located in 21 cities. Despite the relatively high polycentricism in the distribution of these facilities it should be noted that the Warsaw cinemas attracted 81% of all viewers (and together with the multiplex in suburban village Janki 86%). The supremacy of Warsaw weakened slightly after the opening of the multiplex in Siedlce, which is an alternative for residents and pupils from the eastern Mazowsze (instead of capital). However, the concentration of auditoria, screenings and audiences of Warsaw cinemas will continue to grow.

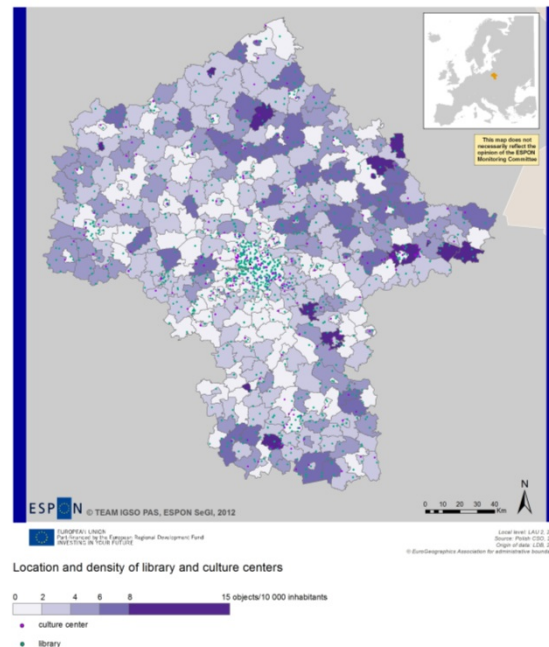
### Showings in fixed cinemas





Important institutions, especially in rural areas of Mazowsze, are community culture centres and public libraries. In 2009, 256 cultural centres were located in more than 150 municipalities. They run nearly 3,000 different kinds of artistic groups and special interest groups uniting more than 60 thousand members. Moreover all communes in the region have public libraries - in 2009 there were 991 (of which nearly 200 in Warsaw), offering over 17 million books.

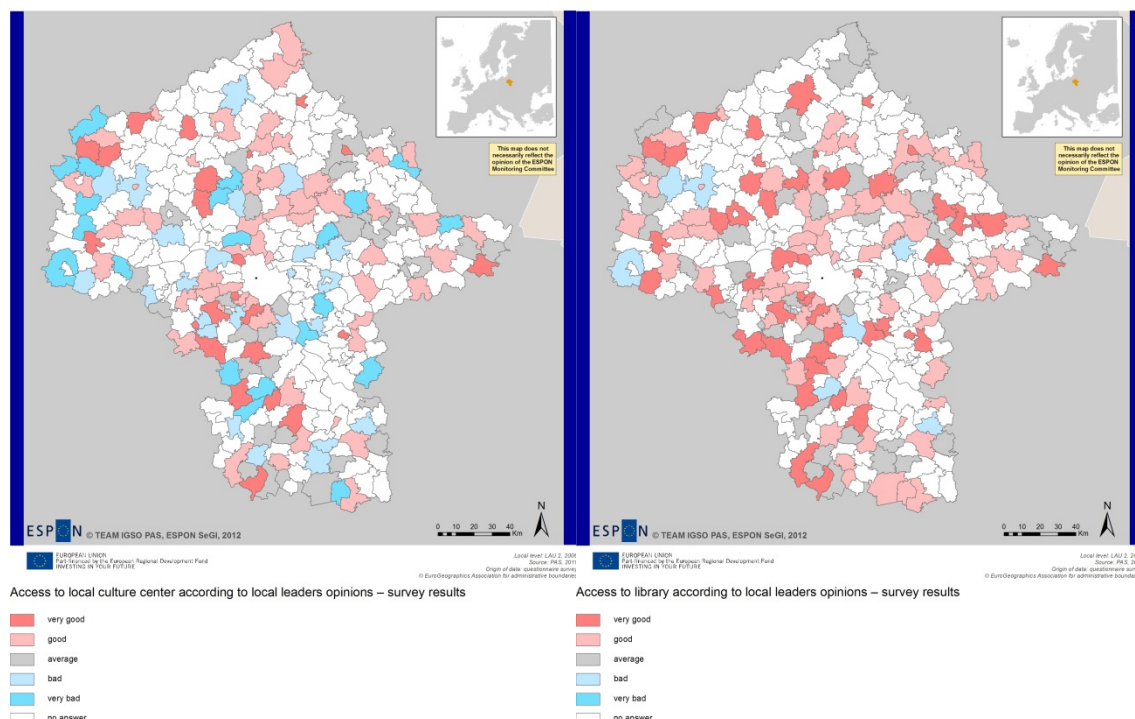
### Library and culture centers



Local cultural centres and public libraries are the most widespread cultural and entertainment institutions in the region. Thus, according to local authorities to the spatial availability of these institutions remains high - and because of the much larger number of libraries the evaluation of their availability is higher than the availability of local culture centres.

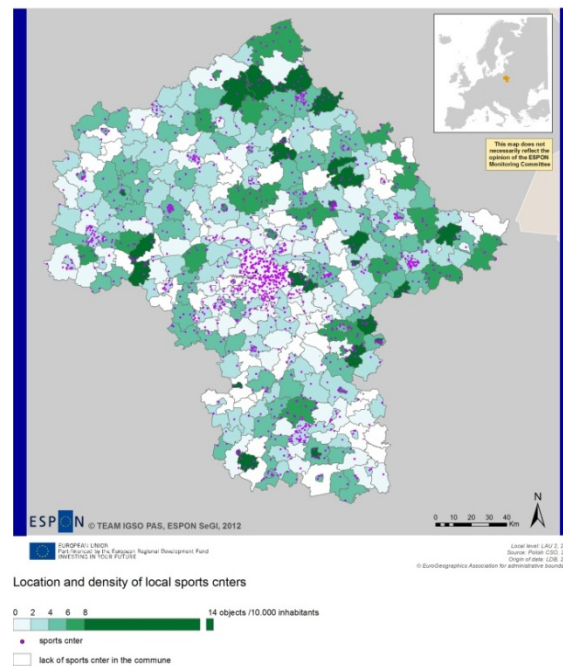
### Local culture centers

### Libraries



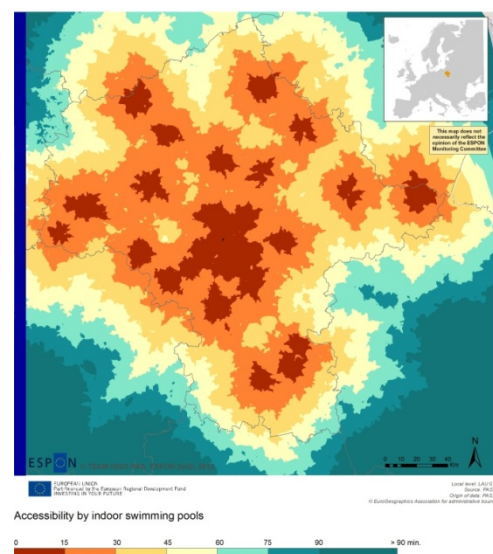
The participation rate of Mazowsze residents in sport clubs activities is one of the lowest in the country - this is partly due to the lack of tradition (for example, in the XIX century in former Galicia (south Poland) operated Gymnastic Association Sokół - currently in the Małopolskie and Podkarpackie regions have the largest number athletes in sports clubs) and the low level of industrialization (sports clubs often established on sites factories). However, currently in Mazowsze over 100 thousand people is a member of a sports club, while in 1999 it was only about 65 thousand. Apart from football, the most popular sport activities are volleyball and athletics. Three out of four athletes are young people under the age of 18. Spatial distribution of sports clubs strongly reflects the settlement structure.

### Local sports centers



The highest saturation of sports infrastructure facilities in Mazowsze is in Warsaw. The only objects that are common other sub-regional centres are stadiums and pitches (including multi-functional once). The objects such as ice-rings, indoor swimming pools (including water parks) and tennis courts are a rare outside of Warsaw. In addition, if these facilities exist typically are located in county centres, which means that access of the majority of population in rural areas is limited.

### Indoor swimming pools



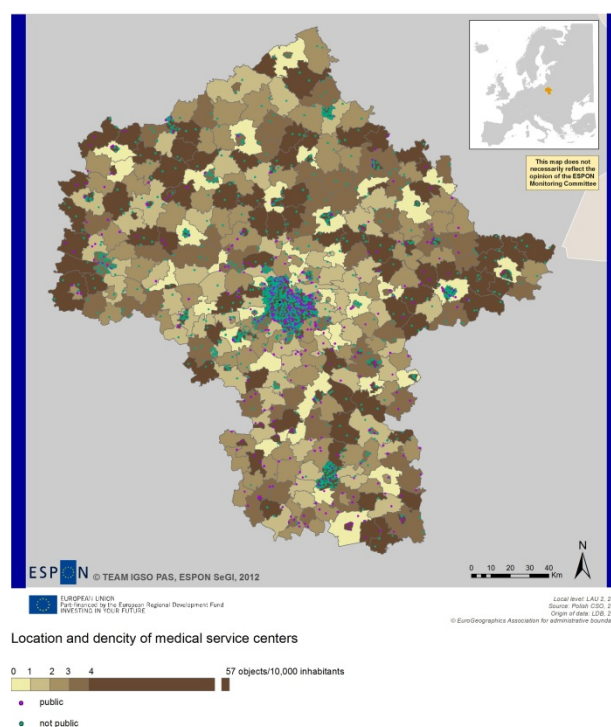
Analysis of spatial access to the indoor swimming pools in the region indicates that the shortest access to these sites have the inhabitants of Warsaw Metropolitan Area, sub-regional centres and their surrounding and selected county centres. The worst availability affects residents of the western part of the Radom subregion, counties: Przasnysz, Sierpc and Garwolin. In the nearest future, this situation will significantly improve after the construction of swimming pools in Przysucha and Chorzele (northern part of the Przasnysz county). It should be mentioned that planned investments were located in the areas where provision of this service and the availability is actually the weakest.

## Care services

In 2010, there were 1,990 Health Care Centres (Zakład Opieki Zdrowotnej - ZOZ), of which only less than one in four was a public institution. In the last few years, a significant increase was observed in number of health care institutions - in 2010 it was higher by 30% compared to 2004. The increase was mainly due to the growth of private facilities - within seven years, the number has risen from less than 1000 units to over 1500. This was due to the option of signing contracts with the National Health Fund (Narodowy Fundusz Zdrowia – NFZ) by private service providers in the same way as in the case of public ones. The largest increase of private health care facilities was recorded in suburban area of Warsaw.

The largest number of health care facilities is in Warsaw and other major urban centres of the region. Usually in rural communes operate 1-2 health care facilities. The indicators of health care service provision based on population are clearly determined by the structure of the settlement network and population density. In suburban communities saturation of healthcare facilities is the lowest, hence the above described trend of increase of the number of facilities in Warsaw suburban zone is due to low supply and high demand, which is further amplified by high rates of growth due to migration. Moreover, low values of indicators in the suburban communes are due to the fact that the inhabitants of these areas are functionally connected with the capital city and have access to some of the services there, including services related to health care. The high rates in remote areas of the region are combined with the fact of low population density, and functioning in almost every commune of at least one general practitioner surgery (in 2010 only 5 communes surgery was not present).

## Medical care service



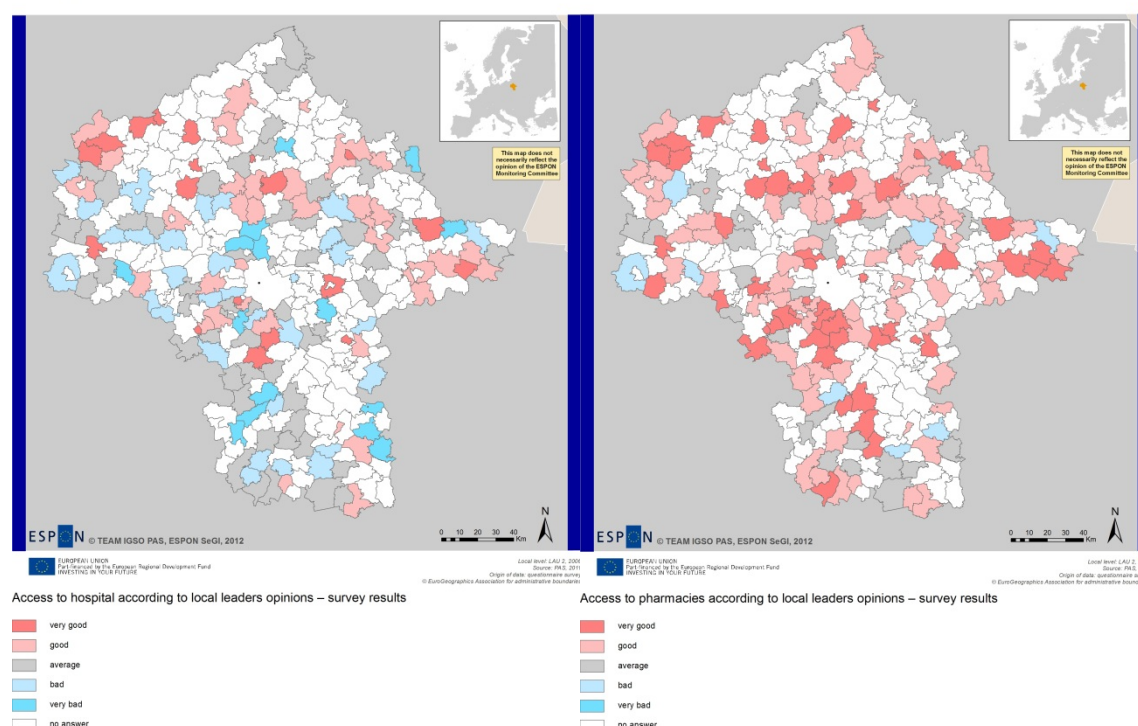
An important issue that should be taken into the consideration in the context of the availability and accessibility of health care is the location of pharmacies. In 2010, in the Mazowsze region, nearly 1500 pharmacies were registered. In comparison with the last years a significant improvement can be observed: the whole region has twice as many pharmacies as fifteen years ago. The largest increase occurred in Warsaw (currently there is 3 times more pharmacies than in 1995) and in the suburban area of Warsaw. Currently, per one pharmacy located in rural areas there is about 8 thousand residents, and in the cities of less than 4 thousand. In 77 communes there was no pharmacy located, but they were almost exclusively rural communities, with main agricultural function. Moreover, despite the increase of general trend pharmacies number, ten municipalities (all rural type) liquidated pharmacies operating there at the beginning of year 2000.

Some alternative to pharmacies in rural areas are pharmacy outlets. The requirements for opening and operating such drugstores are smaller resulting in lower running costs. Such facilities can be open only in rural areas in places where running a "full" pharmacy would be not profitable from economic point of view. Since 2002, the number of pharmacy outlets in the Mazowsze region increased from 25 to 149. They are located in areas where availability of the pharmacy is the lowest. Of the 77 communes in which there was not a single pharmacy in 2010, in 66 was at least one pharmacy outlet.

In Mazowsze in 2010 operated 103 nursing homes. Their distribution in the region was relatively equal. They hosted over 14.5 thousand people, of which the largest group were the elderly (3.6 thousand). It is difficult to point out any regularity within residents depending on the structure of social welfare - the location of this facilities is not connected with a particular area, because the scope of their operation is usually larger than the area of one commune or county. Only in the case of night shelters for the homeless can be seen their concentration in Warsaw - more than half of all places in night shelters is in facilities located in the capital.

## Hospitals

## Pharmacies

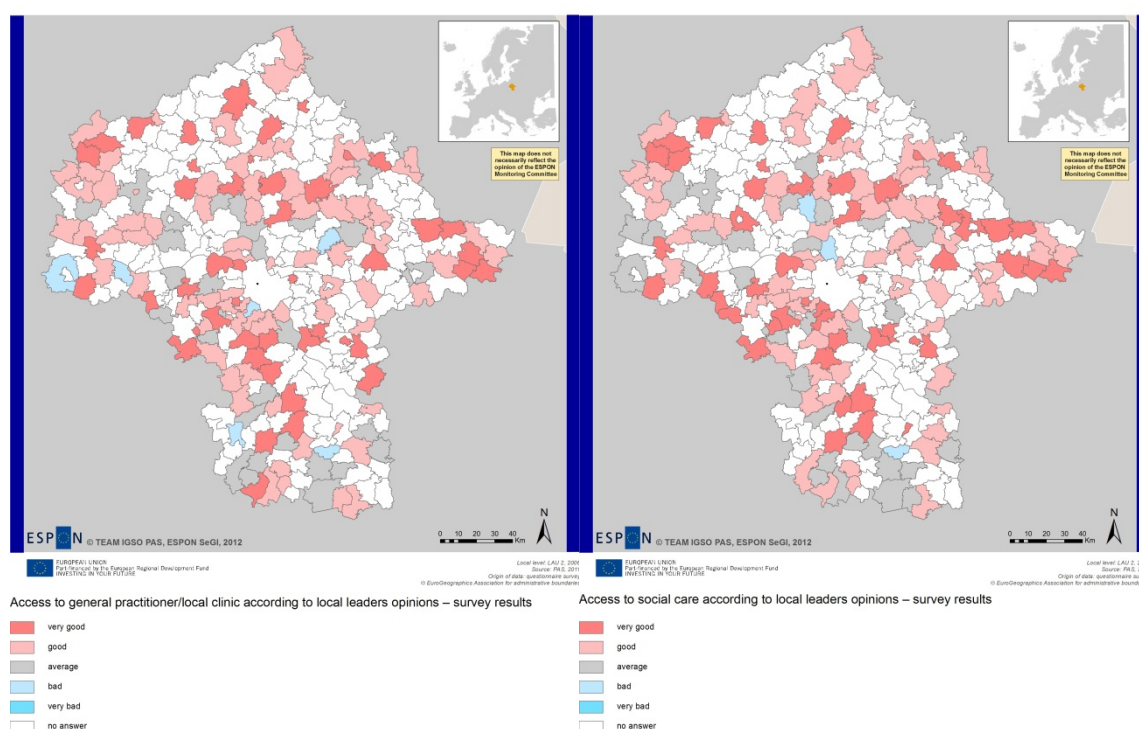


Complementary analyses of accessibility of the Mazowieckie voivodeship health and social care facilities among the representatives of the local government shows that in general inhabitants of the region do not have too much difficulty with accessing general practitioner surgeries. Similarly, good accessibility is provided to pharmacies and social care institutions (including operating in each commune Social Welfare Centres). The weakest availability can be observed in the case of hospitals (more on hospitals in Section 3.2.1.3).



## General practitioners/local clinics

## Social care



## Business services

Business environment institutions are facilities supporting the competitiveness and innovation of enterprises by providing advisory and information services as well as financial ones. Increasingly they also act as a broker and relation supporter in the process of creating a network of relations between science and the economy.

The analysis of the distribution of business was based on the distribution of enterprises by NACE sections and took into account companies such as courier services, finance and banking, legal and accounting, property management, advertising and market research services. While exactly half of the companies operating in Mazowsze is registered in Warsaw, whereas from 50% to 80% of the companies involved in the business support has its headquarters in the capital.

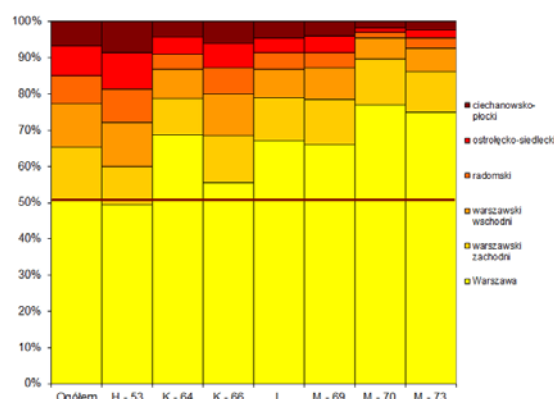


Fig. X. The structure of the selected entities in the sub-section PKD Mazowieckie voivodship in 2010.

Explanation: H-53: postal and courier activities, K-64: financial services, K-66: activities auxiliary to financial services, L: activities related to real estate, M-69: legal services and accounting, M-70: activities of head offices, M-73: advertising, market research and public opinion.

It should be mentioned that, apart from Warsaw, companies from the analyzed section are located primarily in all counties surrounding the capital, and to smaller extent in the sub-regional centres.

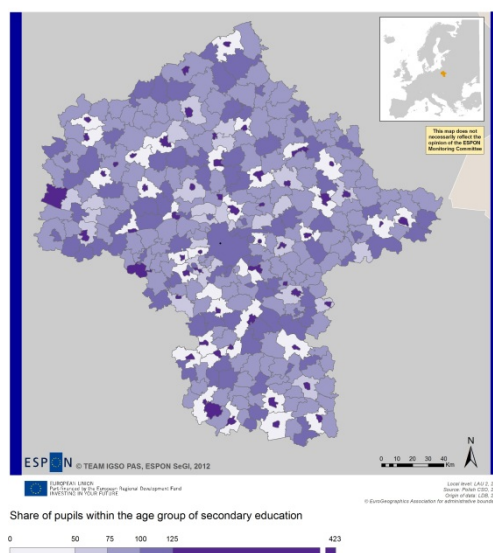
Such diversity of business support companies is primarily related to the concentration within the Warsaw Metropolitan Area (WMA) the largest number of enterprises and population. These companies are created in places where demand for their services is the highest and at the same time the largest concentration of potential employees occurs. In the institutions providing support for business, due to the profile of their activities, mostly people with higher education are hired, and the highest concentration of these people is in WMA - just in Warsaw in 2002, lived 59% of all people with higher education in Mazowsze. Therefore it can be concluded that the large cities and their immediate neighbourhoods allow both having access to customers as well as employees, and therefore these areas are characterized by the highest concentration of business institutions.

### 3.2.1. Detailed Analysis of selected social SGIs in the region

#### 3.2.1.1. Secondary education

In Mazowsze there is located nearly 900 different types of secondary schools, of which 41% are general secondary schools, 24% technical schools, 17% vocational schools, 11% specialised secondary schools, art schools 5% and others 2%. One in three of these schools is located in Warsaw. Secondary education remains the responsibility of the county level administration therefore most schools are located in county centres. Of the four major types of secondary schools - 63% of general secondary schools is located in the town which is county centre, 62% technical schools, 62% of vocational schools and 73% of specialised secondary schools (Warsaw was omitted in this calculations – with Warsaw the concentration of schools in major centres would be even be higher, instead of 64% - 74%). It should be noted that in comparison to 1970, there was a slight dispersion of secondary education facilities in Mazowsze. Forty years ago, within today's region border operated 650 secondary schools in the four analyzed categories, the ratio of the concentration in today's county centres was 82% (with Warsaw) and 70% without capital.

#### Secondary education



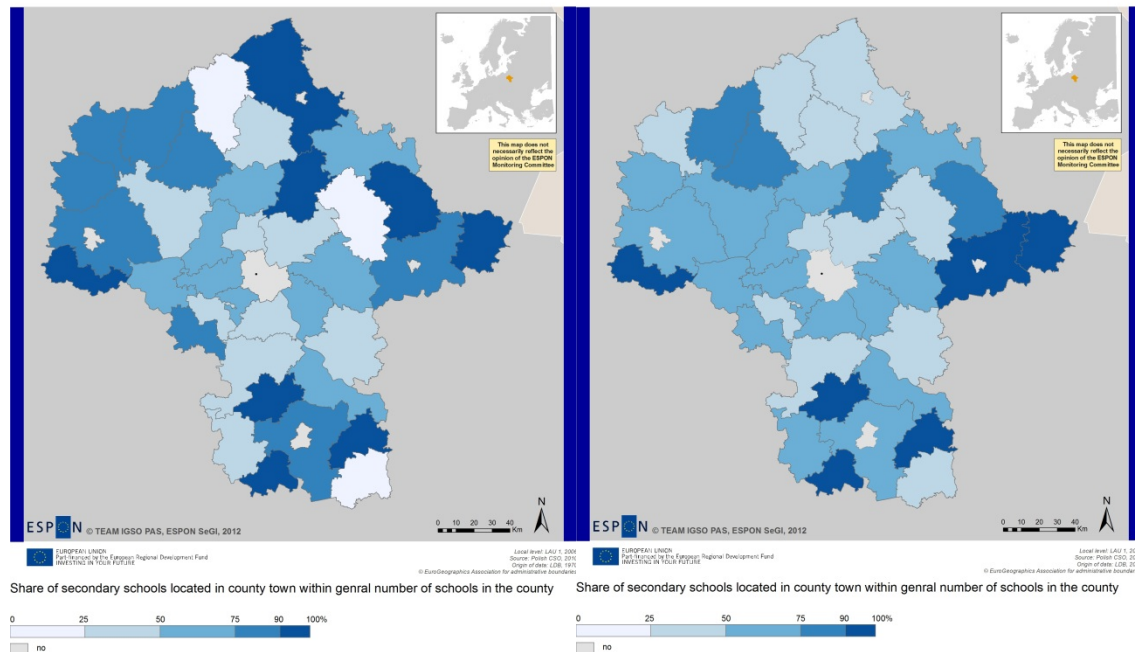
The highest polycentricism in the distribution of the high schools in 2010 could be noticed in counties located around Warsaw. In counties located further away - especially in the vicinity of Plock, Radom and Siedlce can be clearly seen clear concentration of secondary educational institutions in the major towns of the county. In several counties all secondary schools are based in county centres. The higher the concentration of schools in the county town, the greater is the proportion of pupils that have to commute from other communes to the central town. The alternative for these pupils is use of



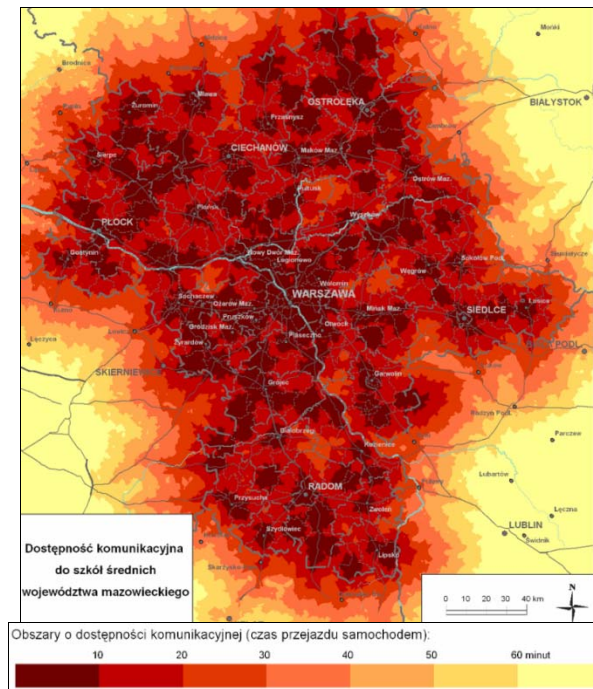
dormitories and boarding houses, although there is only a little such institutions in Mazowsze currently.

### Secondary schools in 1970

### Secondary schools in 2009



The location of secondary schools in Mazowsze voivodeship determines a relatively good spatial availability of these facilities. Travel time (by car) to the nearest secondary school does not exceed 30 minutes, and for most of the region does not exceed 20 minutes. Areas with relatively lower level of availability correspond to those counties, which were characterized by a low level of polycentricism in the distribution of secondary schools. It can be clearly seen in the Eastern part of the region (county siedlecki and łosicki), as well as in the south, in the counties surrounding Radom. The analysis was focused on the spatial accessibility to the nearest facility, which does not necessarily give the actual time that students must spend on a daily journey to school. It often happens that students opt for the more distant facilities, because of: the quality of teaching, the profile of the school or social relationships, etc. Also the analysis was based on model that takes into account road transport only. It should be noted that the actual availability is affected by the frequency of public transport, distance to the nearest bus stop/railway station and departure times of buses and trains. However presented spatial diversity can be seen as a model.

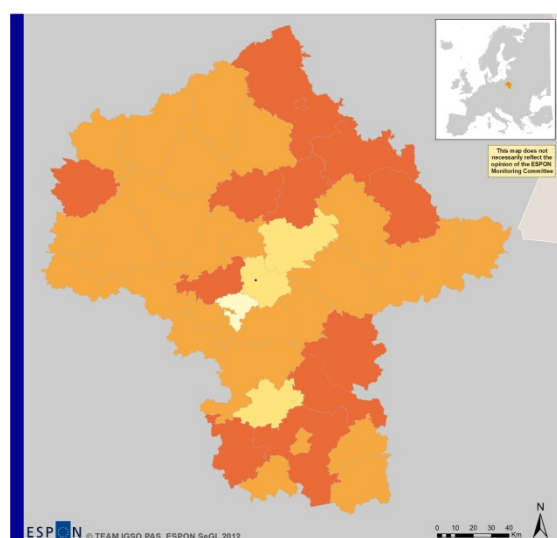


In 2010 the structure of secondary schools graduates in Mazowsze (excluding special schools) were as follows: 60% were graduates of high schools, 21% technical, vocational schools nearly 13%, 6% of specialist secondary schools, art schools around 1%. There is a noticeable increasing trend towards general education, giving the right to continue education at tertiary education level. These processes are even more noticeable when we take as a reference period the beginning of the 1990's - then at the national level only every fifth student was educated at general secondary school, and every third at a vocational school.

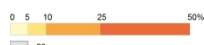
In the case of graduates of general secondary school the dominance of Warsaw and its nearest surrounding is visible, with a clear focus in the west part of the region. Spatial variation occurring are related to several factors. Firstly, the availability of secondary schools and later to higher education is important. The availability of tertiary education (which are the natural educational path after completing secondary schools) is important, because the choice of secondary school planning can be influenced by the potentially low cost of study, if pupil live in Warsaw or its surrounding. Another important factor is the level of parents' education. Warsaw, together with the immediate environment is one of the areas with the highest levels of education in the country. Considering that the educational choices of young people are generally repeat the educational paths of parents, a consequence of the high number of well-educated people will be more interest in type of education facilities that provides similar level of education. Another factor in the high proportion of graduates of general secondary education in Warsaw and its surroundings is labour market demand for highly qualified staff (the highest in the country), which, as mentioned, is conditioned by good post-secondary education.

Overall, in Mazowsze in 2009, there were nearly 7 thousand technical schools graduates - 35% of them graduated from the schools in Warsaw. There is also high concentration of this type graduates in Radom (17%), associated with the traditions of education in the professions needed for the local industry. A high proportion of graduates of technical schools are noticed in the northern and southern counties of Mazowsze, the lowest is at the central part of the region. The highest share of graduates of specialized secondary schools is in the east part of the region. In the capital of the region, there is a clear downward trend in among schools giving specific skills after secondary level of education, for the benefit of general education that provides the basis for further education path.

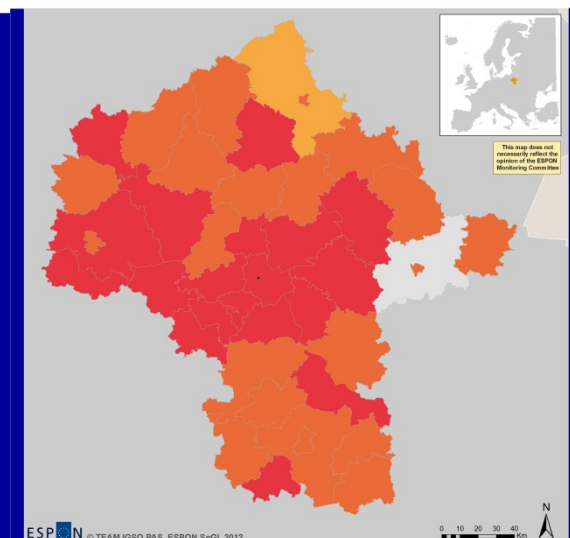
## Technical secondary schools graduates in 2009



Share of technical secondary schools graduates



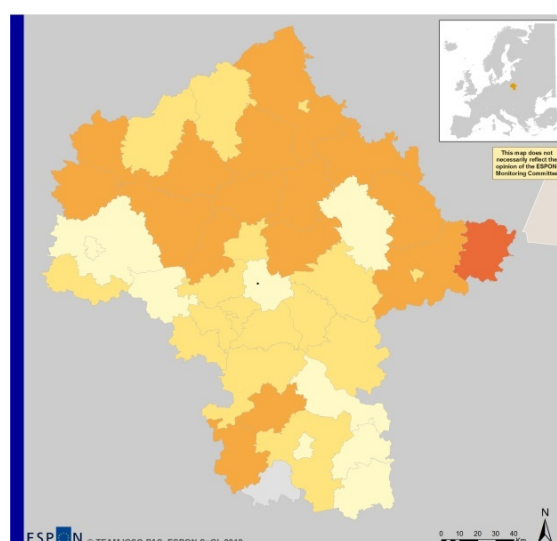
## High schools graduates in 2009



Share of high schools graduates



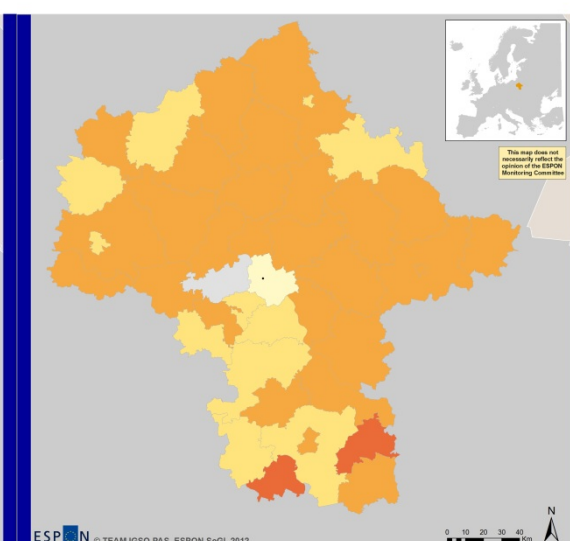
## Specialised secondary schools graduates in 2009



Share of specialised secondary schools graduates



## Vocational schools graduates in 2009



Share of vocational schools graduates in 2009

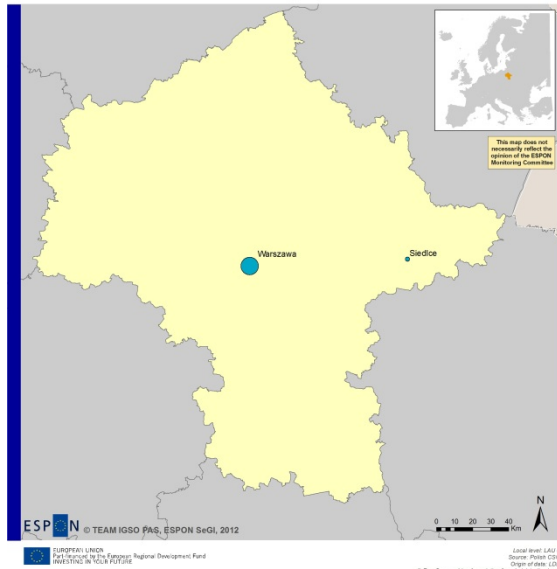


### 3.2.1.2. Tertiary education

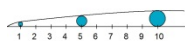
In 2010, in Mazowsze operated 107 tertiary education facilities (including branches) located in 20 cities. Dynamic changes in higher education, particularly in its accessibility, began to take place after 1990. Universities gradually began to appear in smaller towns, with the largest increase in the areas surrounding traditional academic centres (like Warsaw). This was due to the fact of the limited mobility of academic staff, associated with academic centres, as well as the creation of new universities in places the greatest demand. Both now and in the past Warsaw clearly dominated over the other academic centres in the region. This is due to the high potential of public but also private tertiary

education units in the capital. In 2002, 68 schools located in Warsaw registered almost 300 thousand students (80% of students in the region and 16% within whole the country). Within Mazowsze can point out four other cities that have a noticeable share of region's students - Radom (7%), Płock (4%), Siedlce (4%) and Pułtusk (3%).

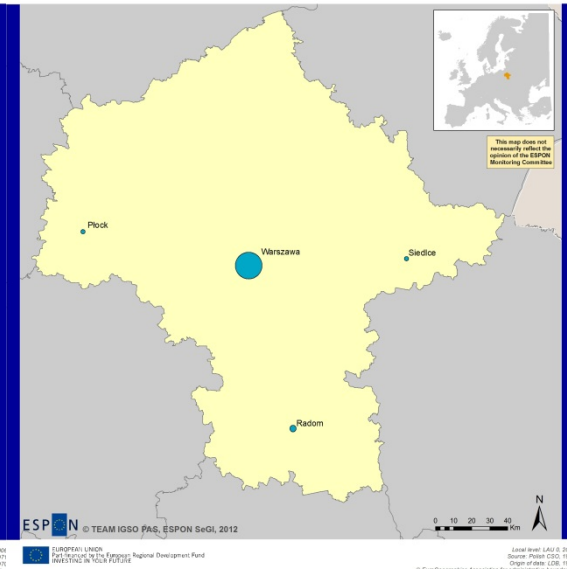
### Tertiary education in 1970



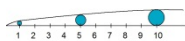
Number of tertiary education facilities



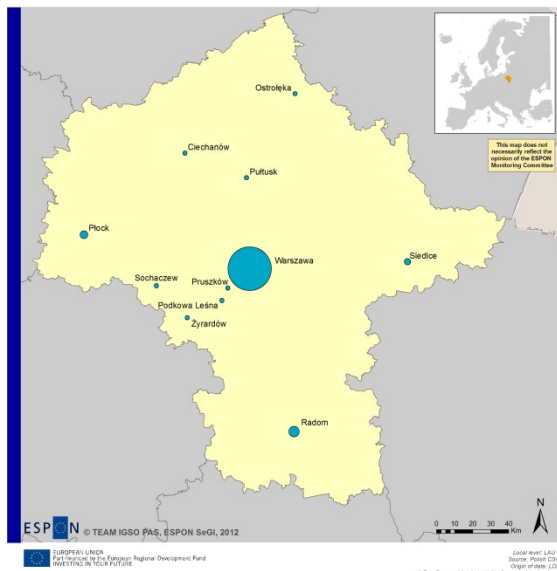
### Tertiary education in 1993



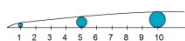
Number of tertiary education facilities



### Tertiary education in 1999

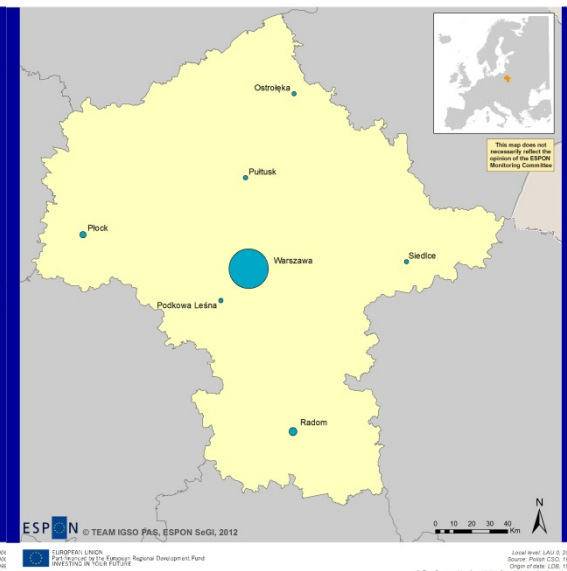


Number of tertiary education facilities

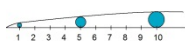


Warsaw 58 tertiary education facilities

### Tertiary education in 1996



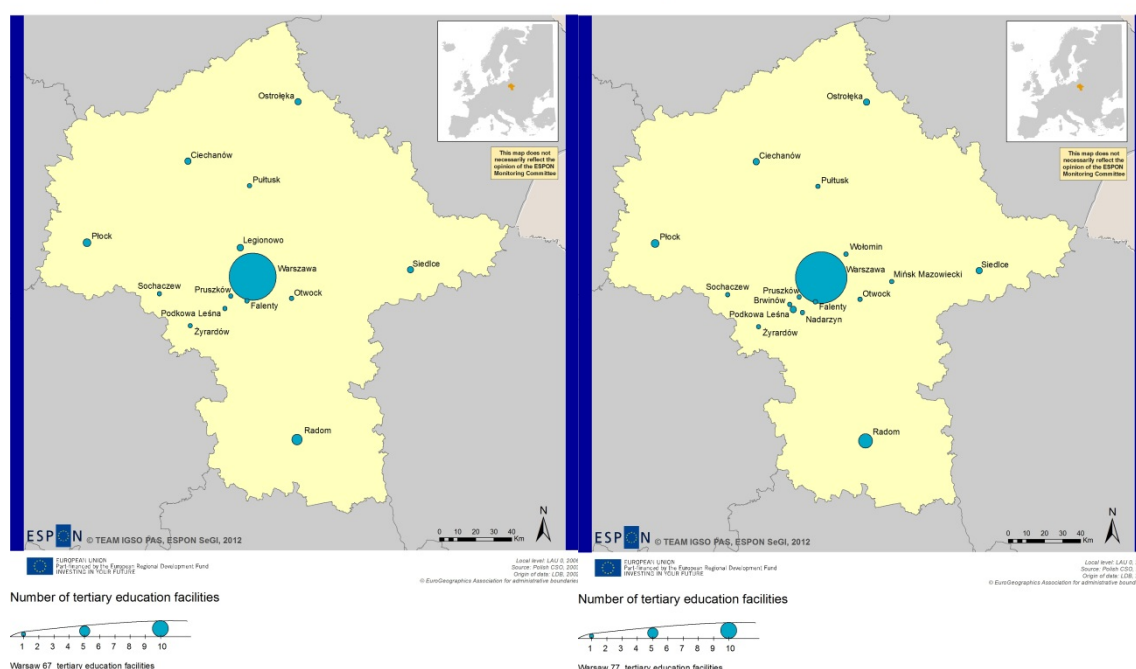
Number of tertiary education facilities





## Tertiary education in 2002

## Tertiary education in 2010



Mazowieckie voivodeship, like other regions in the country, is characterized by a very monocentric structure of higher education facilities, although a minor role in the academic structure of the region play sub-regional centres (Radom, Siedlce, Plock). Despite the extensive changes in the network of higher education facilities in the region (which coincide with nationwide changes) and the apparent increase in de-glomeration of tertiary education facilities in the region after 1990, there is still overwhelming dominance of Warsaw, where the largest not only of region but of the country academic institutions are located. It is true that during the last few years the number of universities has increased significantly in Mazowsze (from two in 1970 to twenty in 2010), however the concentration of students in the most prestigious public universities in Warsaw remains at a very high level. Thus, despite the relative increase in the number of places in the whole region where tertiary level educational services are provided, there is still a clear concentration of universities in Warsaw. In this case, the existing differences should be seen as positive ones, because only the largest universities with a long tradition can provide a high quality of education at the tertiary level. A significant maybe also an effect of concentration of a large number of tertiary education facilities, as more potential for developing interdisciplinary learning process - for example, a choice of two or three courses. Also for the opportunity of acquiring practical knowledge (internships) concentration of educational and economic potential is favourable.

Transport accessibility to the largest academic centre in the country, which is Warsaw, is determined by weak transport infrastructure (especially roads) to the capital. Natural concentric system is disturbed of the few routes that offer higher speed potential in road transport. If it is assumed the travel time that allows to study on a daily basis, without having to change the place of residence is 60 minutes, then it turns out that in zone of such accessibility is located central part of the region with its south-western fringes (only there the zone is adjacent to the borders of the province). In the north-west, this zone extends to Płock, in east to Siedlce and the south-east does not reach even Garwolin.

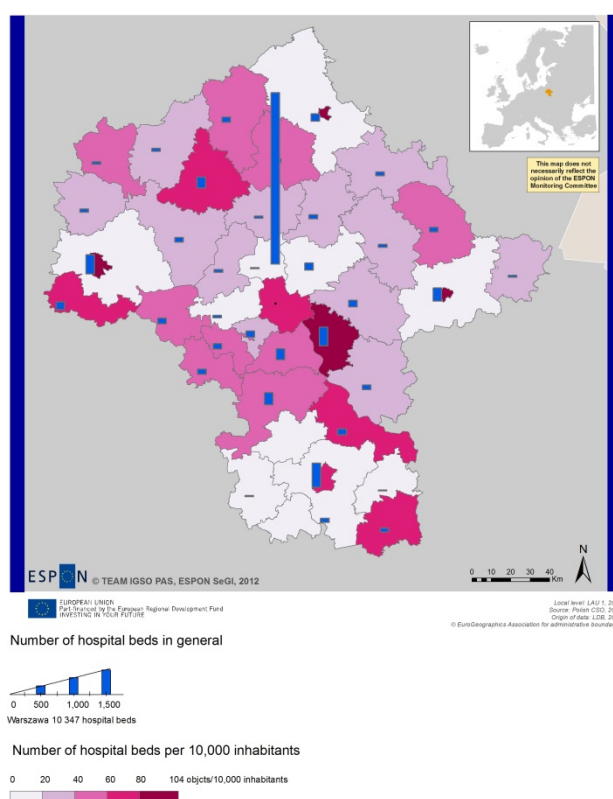
Comparing the number of students and graduates in the Mazowsze in 2005 and 2010, the tendency of students' number decrease is clear. This is a consequence of a decline of population at the age groups suitable for studding. However, a much larger relative decrease in the number of students can be observed in small academic centres, and much smaller in Warsaw. This means that the process of reducing the number of students affected centres with lower reputation, which offer a smaller range of educational and non-educational opportunities in comparison to the capital of the region. Thus at the labour market the most valued are employees with a good degree of public universities located in Warsaw. That is the reason why despite an overall decline in the number of students, the process

was less noticeable by the universities of Warsaw, and much more by those located in Radom, Płock, Siedlce or Ciechanów. It is expected that after a period of certain academic de-glomeration in Mazowsze (although as it was mentioned it was to some extent apparent phenomena), there will be a process of concentration of students at universities in Warsaw. Reducing the number of students in tertiary education facilities located in smaller centres will lead to their liquidation. This process is a linked with socio-economic development in Mazowsze in two ways. First of all the contemporary dominance of tertiary sector of economic activities (services) in Warsaw generates demand for workers with higher education. In smaller towns, the supply of jobs is not so high, therefore, students prefer universities in Warsaw, so already during studding period can earn internships and get work experience. In addition, development of the university located in Warsaw, also contributes to the development of associated services (e.g. accommodations, dining, entertainment, public transport, etc.), which is an important generator of development. Secondly loss of academic functions in smaller centres will result not only in weakening their prestige and slowing development of human capital, but also can result in the liquidation of some of the companies for which one of the main customers were students.

### 3.2.1.3. Healthcare - Hospitals

In 2011, according to data from the Ministry of Health, in Mazowsze were 85 hospitals with 776 hospital departments and nearly 30 thousand beds. About half of the hospitals, as with the nearly half of beds, was in Warsaw - 35 hospitals with more than 14 thousand beds. Other sites were located in the large cities of the region, especially in county centres, however in the region can be identified three counties without hospitals - białobrzegi, legionowski and szydłowiecki. Some hospitals are located in smaller towns, but they usually specialist units (e.g., Hospital for Mental and Nervous Diseases located in Ząbki). The highest saturation of the hospitals and hospital beds is in the county Otwock, due to the Otwock forests several specialized institutions dealing with tuberculosis is located there.

#### Hospitals

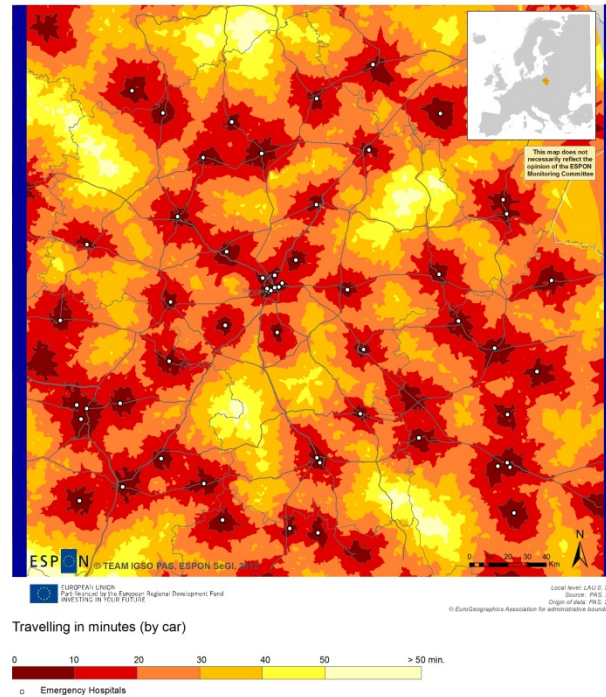


Isochronal accessibility analysis is derived from the location of the hospitals in county centres. In the central part of the region and around most county centres average driving time to the hospital is relatively short and usually does not exceed 20 minutes. The situation is worst in the peripheral areas (in county context), which is particularly evident in the north-west (the area within the triangle Płońsk-



Sierpc-Mława), east (areas between Ostrów Mazowiecka and Sokołów Podlaski) and in the southern part of the region (east of Białobrzegi). Inhabitants of these areas need at least 30 minutes to drive to the nearest hospital, in the last case, the values of the ratio goes up to 50 minutes. Despite the apparent "islands" of poorer access to hospitals, travel time to the nearest facility seems to be acceptable almost everywhere in the region.

### Travelling accessibility to Emergency Hospitals

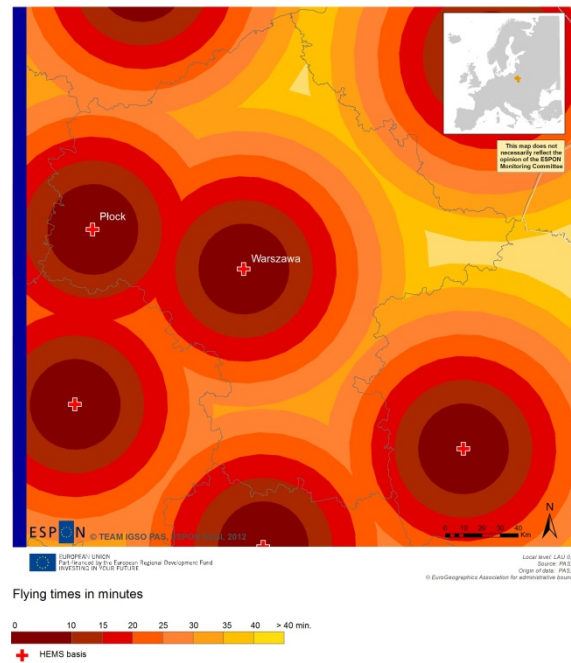


The basic element of the State of Emergency System is the so called Hospital Emergency Units (HEU). Currently in the Mazowsze voivodeship are 28 HEUs, 9 of which are located in Warsaw. In total they have 184 beds (67 in Warsaw). Can be point out to two large compact areas that are likely to be areas with peripheral location in relation to the SOR s: eastern part of the region, between Ostrów Mazowiecka and Siedlce (sokołowski and węgrowski counties) and the south-west (north and north-west of Radom: counties grójecki, białobrzegi, żyrardowski and przysuski). To a lesser extent, peripheral location may affect counties: żuromiński and sierpecki the north-west and zwoleński and lipski in the south region. This observation confirms the isochronal analysis of accessibility. It is worth mentioning that in the southern part of the region situation greatly improves thanks to presence of HEUs in neighboring regions. However, there are still the areas, for which is not possible to drive to the nearest HEU in less than 30 minutes. These areas are home to approximately 20% of the population of the whole region (about 15% when the neighbouring provinces are considered).

The distribution and availability of emergency medical services are important issues when we consider accessibility. In emergency situations, medical transport of patients (e.g. in case of injuries) is provided by the Independent Public Health Care Air Rescue (Helicopter Emergency Medical Service - HEMS), which reports directly to the Minister of Health. The Mazowsze has two bases of HEMS equipped with two rescue helicopters. One base is located in Warsaw, and the second one in Płock. HEMS crews are on duty from dawn to dusk, but this year it is planned to extend the duty to the whole day. In addition, the HEMS aircraft is stationed Warsaw airport. The HEMS operating range is the area within a radius of 130 km from the base of the helicopter. For this reason, in the Mazowsze voivodeship are covered by services of helicopters based in the neighboring provinces: Białystok, Kielce, Lublin, Olsztyn, Łódź, Bydgoszcz and Suwałki. Due to the range of coverage of the region's the most important teams HEMS for Mazowsze (apart local ones) are the first four of the teams

mentioned before. The worst situation in terms of time helicopter rescue is in the eastern and north-eastern parts of the region (counties: łosicki, ostrołęcki and the eastern part of the sieldecki county).

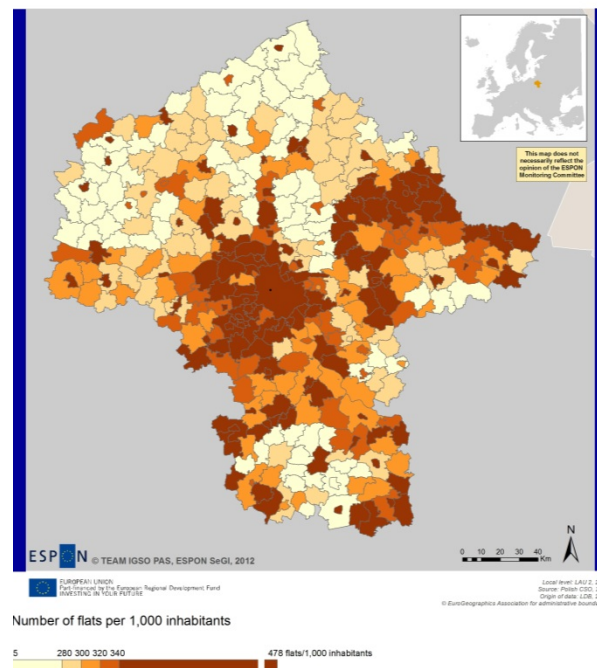
### Air accessibility of Health Emergency Medical Services



### 3.2.1.4. Housing

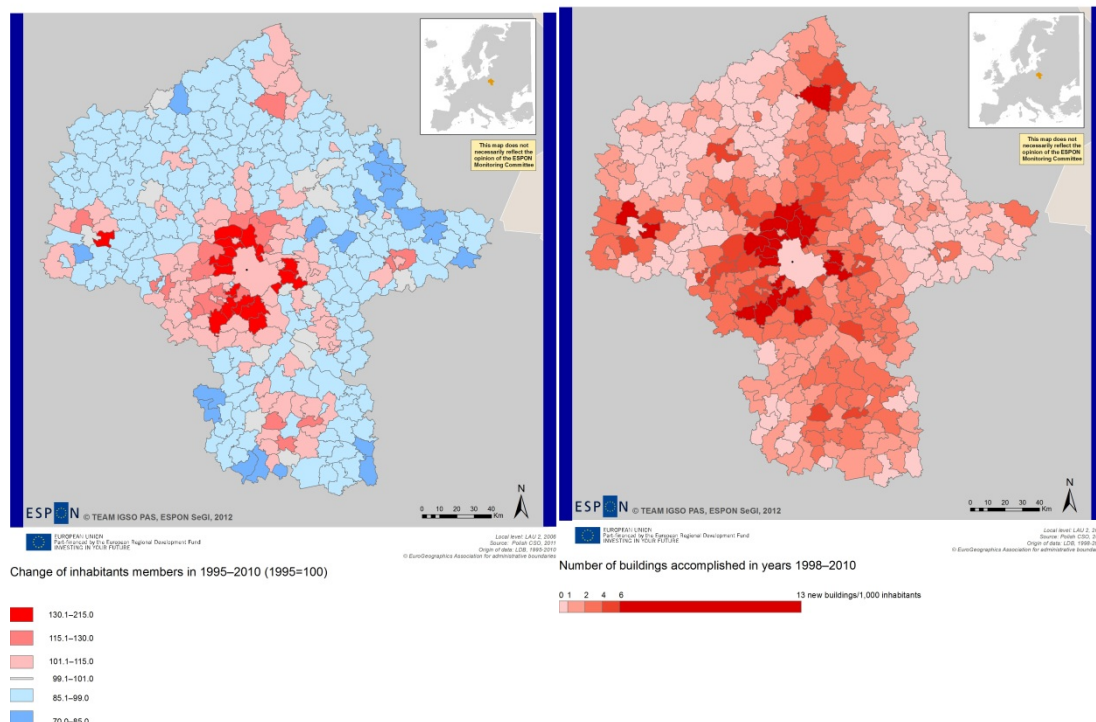
The largest number of residential buildings among Mazowsze communes are in: Warsaw (almost 84.1 thousand residential buildings or about 10% of residential buildings in the region), Radom (19.6 thous.) and Piaseczno (14.4 thousand). It is natural that a greater number of residential buildings are located in areas with higher population density.

## Number of flats



That is way in Mazowsze the highest number of dwellings per thousand inhabitants is observed in Warsaw Metropolitan Area - it is the result of size of households (the structure is dominated by small families, with a high proportion of single-person households). High saturation of flats was noticed in southern part of the Siedlce-Ostrolęka subregion - in recent years there has been an intensive process of building recreational development in this area (in relation to two factors: to the landscape values of the river Bug and a relatively small distance from Warsaw). In other areas of the region (especially those peripherally located in rural areas of agricultural character) saturation flats per thousand inhabitants is much smaller. This is due to extended families live together, and low levels of construction.

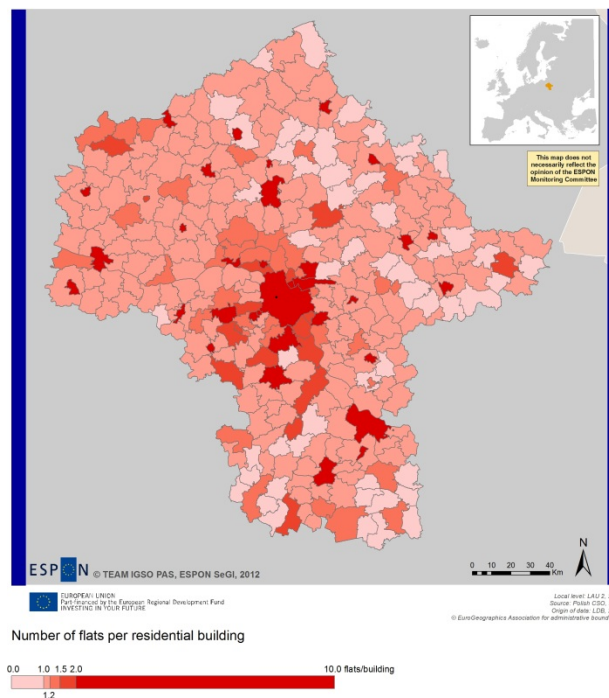
## Number of inhabitants in years 1995–2010 New residential buildings in 1998–2010



Nowadays, the population increase is observed primarily in suburban areas - population growth in the period 1995-2010 was observed in dozens of municipalities around Warsaw, 10 around Radom, 5 around Płock and Ostrołęka and one near Ciechanów and Siedlce. Changes in the population shows a strong relationship with the construction of new houses. Average in Mazowsze arose 1.8 building per 1,000 inhabitants during the period 1998-2010, however spread between minimum value (0.12 building per 1000 inhabitants in the commune Przesmyki, near Siedlce) and maximum value (12.8 in commune Słupno, near Płock) is enormous. Generally, the largest construction traffic is observed in the municipalities in the counties surrounding Warsaw - especially in areas of high landscape values (like Kampinos Forest, Lake Zegrzyńskie) and good transport accessibility (railway lines towards Otwock, Grodzisk Mazowiecki and Wołomin). The compact area of municipalities with intensive construction development are suburban zones of Radom, Płock and Ostrołęka. In the case of Siedlce and Ciechanów high values of construction development are limited to individual communities (rural communes respectively Siedlce and Ciechanów which surrounds the towns). In Mazowsze voivodeship in the years 1995-2009 housing investments rose the highest in the country (about 26%). This increase was mainly due to the rapid growth of housing in Warsaw (about 33%). In the rest of the region housing increased since 1995 by 21%.

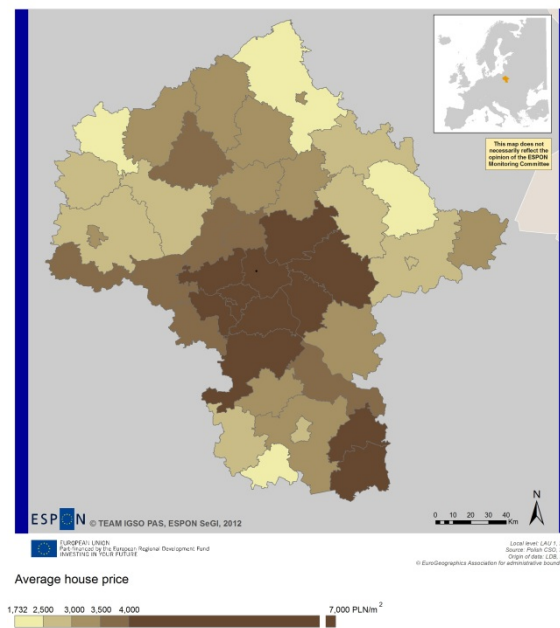
Peripheral areas of the region are dominated by single-family houses, while in the cities and their suburban zones, a larger of multi-family structures are being build.

## Housing



Can be observed a clear correlation between the price of the building plot, home or flat and the distance from Warsaw. The most expensive plots of land are in counties adjacent to Warsaw, prices are much higher in the south (left bank of the Vistula River) and west of the capital. Relatively cheap is land on the right bank of the Vistula, and the cheapest in the counties located further away from the city borders.

### Average house price



### 3.3. Summary of the general results of questionnaire

In the opinion of the representatives of local authorities in most districts of the region in social infrastructure facilities in the Mazowsze region is at least satisfactory. In each commune operate primary and secondary school, public library, health care facility, post office and local cultural centers. In majority of counties operate county hospitals, secondary schools, banks and the whole range of specialized institutions such as nursing homes and educational institutions, kindergartens, special schools, family assistance centers, police stations, fire stations (firefighting), labor offices, educational socialization therapy workshops, emergency medical stations, psychological and pedagogical teacher training centers, practical training centers, etc..

During the last 20 years have observed tremendous increase of quality of social infrastructure institutions. It is true that the numbers has not increased significantly (apart from ICT and banking and commercial services), however large financial resources has been invested in modernization (mainly thermal insulation replacement of windows, roof and façade painting) of school buildings, hospitals, community centers as well as providing them with art equipment. Currently, schools and health care building are the most representative objects within the municipalities. In addition, significant progress has been made on the development of sports infrastructure - pitches, indoor and outdoor swimming pools and sports halls has been built. Most of the investment was financed from own resources of communes and counties, however part of them was acquired from the European Union funds or the state budget and Mazowsze Regional Council.

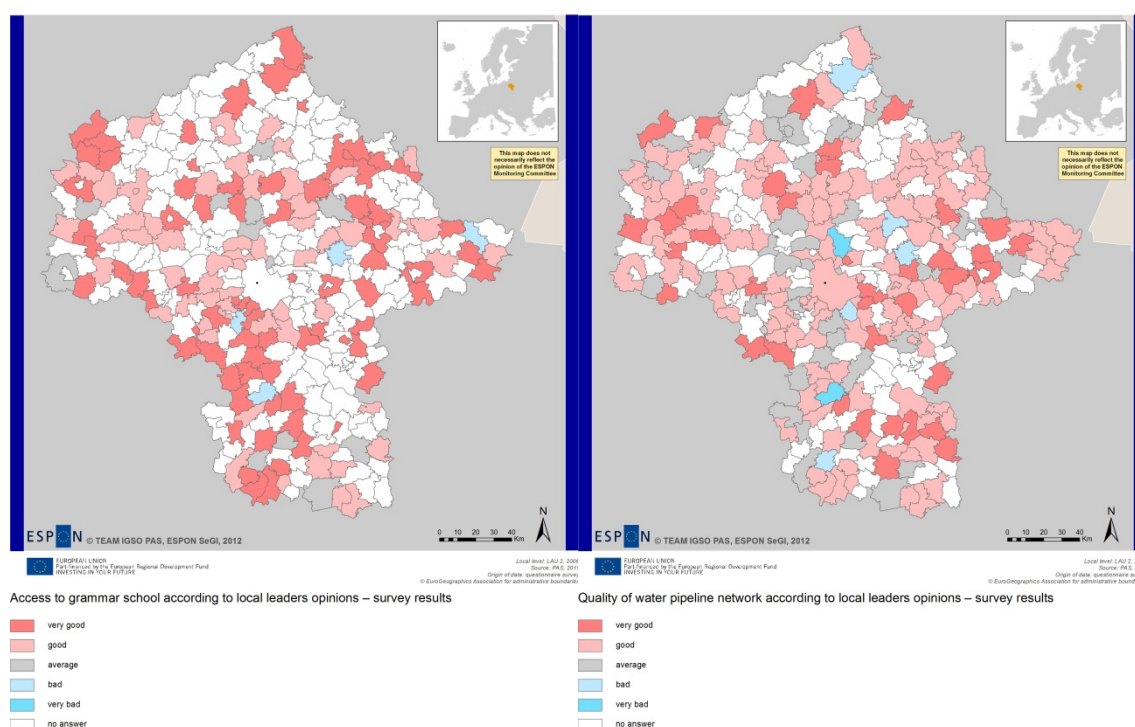
In the opinions of majority interviewees was mentioned statement that the spatial accessibility social infrastructure is quite good and has improved in the last several years, due to the improvement of transport infrastructure and increase in individual car ownership. The problem of accessibility still remains visible in case of certain specialized medical services, which are located outside the majority of counties or are paid, what created financial barriers. Moreover the accessibility of communications infrastructure is not optimal - it is noticeable that internet access to certain areas of the region is not sufficient. In all counties the best accessibility to social infrastructure and public services have the inhabitants of county centers.

As a result of demographic change of the small schools in remote areas are being closed on the other hand, in the suburban counties new educational facilities are being established – e.g. kindergartens. More and more often in various towns of the region are established nursing homes (focused on elderly care) and medical care facilities.



## Grammar schools

## Water pipeline network



## 3.4. Conclusions of the regional case & elements of prognosis

The most important conclusion from the analysis of the distribution and availability of social and economic services is the gradual commercialization of certain institutions. In recent years number of private kindergartens, pharmacies and health clinics was open in the region. The increase, however, mainly focuses the areas with higher demand for these services, mainly in Warsaw (its suburban areas) and other major cities in the region. In other areas stagnation in provision to social infrastructure facilities can be observed. It leads to deepening intra-regional disparities and the largest supply of educational institutions, health and recreation occurs on areas of greatest demand. A very important determinant of the development and transformation of social infrastructure facilities will be demographic processes in the future - gradual decline the number of children and young people reduces the need for opening new kindergartens and schools, and increase share of older people in the population structure will force need for hospitals, other health care facilities and social security.

## 4. Conclusions

Emblematic turning points in the history of Poland affected the whole political-socio-economic context of the country. These have also impacted in the provision of services of general interest in the country. Poland was a divided country before the First World War, was united in between wars, devastated during the Second World War, redeveloped under a central planning communist system, and transformed after transition into market system after 1989.

Facilities and infrastructure for the provision of services of general interest were also devastated during the Second War. Their reconstruction, although centrally planned and with communist aims of universalisation, had limitation of resources and thus lacked investments. Therefore, yet universalisation of electricity provision within all Polish territory was achieved and some good provision of some social services of general interest, the country presented a degree of regional differentiation in two main regards: the western part of the country counted on a better provision of SGI, and rural areas faced scarcity of such provision.



The development of SGI in Poland got strength after the transition, with the increase of investments that followed the opening of the economy for market services, foreign investments and private provision of SGI. In this sense, especially technical infrastructure gained momentum and was extended to rural areas, as observed in the cases of water and gas pipelines, which increased largely in rural areas after the transition.

Also in this period, the entrance of private providers of SGI occurred in Poland. This was observed mainly in public transport, telecommunications and some social services, notably in education and health services. Private kindergartens took over the space left by closure of public kindergartens where the dispersed settlements made them financially unfeasible. Increase of private providers for higher education was also observed, especially in areas of academic concentration (which resulted in concentrated demand). Remarkably was the raise of private health clinics, an essential social service. However it must be observed that private providers seek profit and essential services should be provided for all inhabitants.

Increased private provision of SGI, nevertheless, raises high socially exclusionary dynamics. If schools were not financially feasible for public provision, it is estimated that the profit-driven private service will be expensive and possibly with low quality if in an environment with no competition. Such expensive services keep at a bay all low income groups of the populations, which are generally those in more need of services.

In 2004, Poland had its accession to the EU, what had two major impacts regarding SGI. Firstly, the country became entitled to use the EU Funds, markedly the Structural Funds and its resources for investment in expansion and modernization of SGIs. New investments in services (especially infrastructural based services: water pipelines, sewage systems etc.) are occurring due to EU funds. Secondly, Poland became subject to EU regulations for services and markets, including (soft or hard) regulations on the provision of SGI regarding liberalization, deregulation and privatization of services. Governments in Poland still find it hard to build internal capacity to properly regulate and control essential services being provided by private companies. Public-private partnerships and cooperation are rather rare.

Such new EU regulatory requirements raised also challenges, for instance environmental, which remains a problem in Poland and in the region of Mazowsze concerning sewage system and sewage treatment facilities that are still lacking in the country and in the studied region. The relation between infrastructure and economic development raises also a challenge, with the modernization required in countries of Eastern Europe, what includes Poland. The accession to the EU and the consequently position of eastern border of the Union, further deepened the east and west differences observed in Europe and within the Polish territory. The opening borders of west and further closure of eastern ones increased the poverty and scarcity of SGI of eastern Poland.

Notwithstanding the investments brought by market opening and EU accession, Poland got also more vulnerable to external economic shocks and investments were reduced with the economic crisis started in 2008. This concerns primarily central investments but expands also to the local level, which are traditionally more fragile economically and in especial in regard to capacity of investment in costly infrastructure of services like health, transport in rail and roads, water pipes, telecommunications, education. More affected are major road projects and transport accessibility than local undertakings in the sphere of social infrastructure.

In demographic patterns, Poland also followed European standards and is facing demographic changes as the aging of the population, imbalance of gender structure and the increase of peripheral areas suffering from depopulation. The changing family model resulting in the need of care for children (kindergartens) and the elderly (nursing homes). Changes in citizen's preferences and behaviours also impacted; as for instance, changes in transport needs and uses, e.g. an increasing role of individual transport (in an inverse correlation with the quality of public transport). This process is especially observed in the Mazowsze region, where growth of the individual journeys is not only a consequence of the rapid suburbanization and motorization, but perhaps mostly of the de-concentration of jobs that were previously supported by public transport. Another new behaviour regards cultural activities, which is exemplified by a mass-consumption pattern in culture: small art

cinemas are closing, while large multiplexes in shopping malls opening are being opened. The agglomeration pattern of services provision is observed even in cultural services in Poland.

Demographic and urbanization structures, as well as the structure of settlements, were found to be a crucial issue in the provision of SGI in Poland. As the regional case study involved the capital city of Poland, which forms its bigger agglomeration (and consequently the higher population density – i.e. higher demand for SGI), our study portrayed the emblematic tensions concerning the territorial distribution of services between the capital region (or regional centre) and rest of the country/region. Warsaw and its surroundings represent this contrast with the rest of the region Mazowsze and of the country Poland.

Therefore, a main finding of this ESPON research is about the distribution of SGI, which are concentrated in areas with high demographic density. Services are often centralized in agglomerations and centres of counties and towns (e.g. education, health service, telecommunications, sewage, etc.). Economies of scale privilege large towns, the larger the agglomeration, the larger the incentives of services providers to serve the region. Small towns/villages find it hard to provide service in remote areas or maintain high quality services due to their financial feasibility.

In the region Mazowsze, there is a strong polarisation between rural and urban areas. Examples of such tension regards mainly technical infrastructure, especially sewage treatment in rural areas – although this has increased immensely after accession to EU. However, the region remains without any provision of gas supply. The region faces deficiencies in provision of public transport too; such as uncovered areas, faulty time tables, etc. and the solutions fostered are generally based on private cars without innovative solutions as shared or electric cars instead of improving public transport. Moreover, climate change and changing weather patterns are provoking a need to improve the technical infrastructure. In Mazowsze the capacity of drainage systems must be improved, since they are not sufficient. It must be stated that rural areas are not more deprived in terms of SGI; they are also more vulnerable because of their higher poverty, when compared with the healthier area of Warsaw.

Policy recommendations, in this sense, regard paying attention to the social and territorial balance of SGI moving far beyond solely taking into account the profitability of the services. This is achieved by centring efforts on the public coordination of SGI provision, no matter if the provider is public, private or hybrid. Such multi-level coordination is imperative to organize and distribute cross-subsidies that will contain unmeasured profit seeking in agglomerations and guarantee means of financing services on remote, mainly rural areas.