

The automotive picture of Poznań against a background of other cities and national indexes

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Summary. Following the dynamic development of the automotive industry and economic changes in the last 20 years Polish transport-related needs and citizen mobility have changed as well. An increased demand for traveling and easy access to individual means of transport in the form of passenger cars put Poznań in the top ten of the largest cities of Poland in terms of the motorization level. The paper analyses the current situation of the level of motorization of the city of Poznań based on statistical data from Central Vehicle and Driver Reg-

ister, Department of Motor Vehicles in Poznań and published by Central Office of Statistics. A synthetic analysis has been presented of the situation in Poznań against other largest cities of Poland and the average situation in the country. The paper also presents the analysis of the preferences of the citizens of Poznań in terms of engine capacity, type of fuel, engine type as and the most popular vehicle makes.

Key words: city of Poznań, motorization, statistics, mobile society.

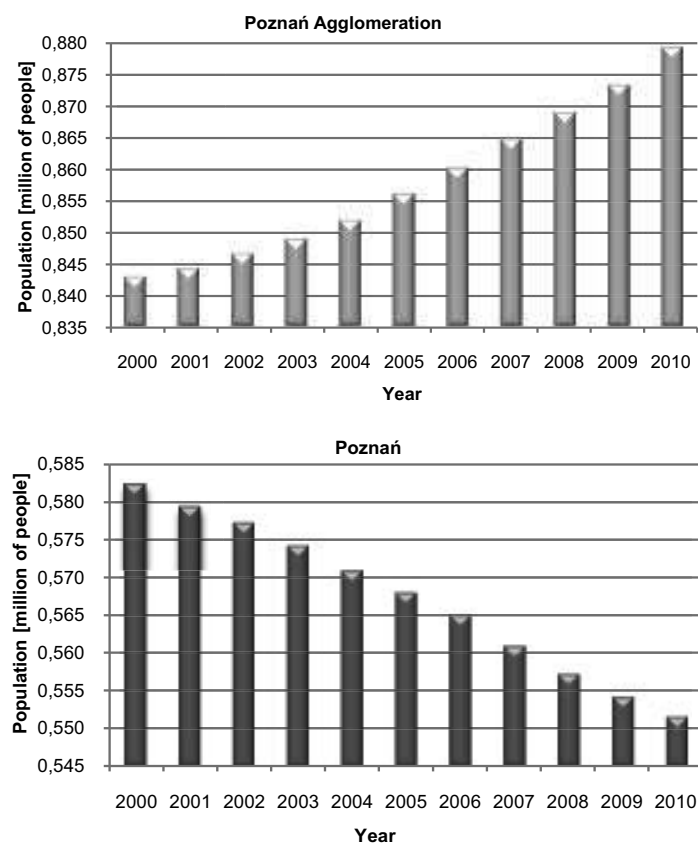


Fig. 1. Changes in the population of Poznań and the Poznań Agglomeration

INTRODUCTION

Poznań as one of the oldest cities and the fifth in terms of population in Poland is an important center for industry, trade, culture and higher education [1]. The population in 2010 was 551600 inhabitants [2]. This value is subject to a constant change (fig. 1). The city population is greatly affected by a negative human migration triggered by the so-called sub-urbanization [3]. The citizens move to adjacent towns preserving their employment in Poznań. The result of such actions is a growing population of the Poznań Agglomeration while the population of the city itself drops regularly.

Poznań is one of the strongest cities in Poland in terms of economy being at the same time one of the main centers for foreign investment [3]. In Poznań there are over 99000 economic entities while the number of foreign capital entities is one of the largest countrywide (approximately 2800) [3]. Hence, the unemployment rate, according to the September 2011 statistics is one of the smallest in Poland (fig. 2).

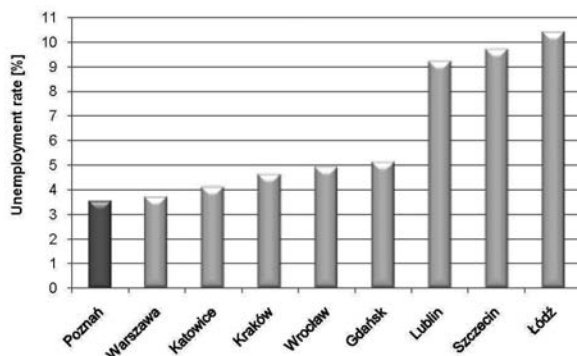


Fig. 2. Unemployment rate in the largest Polish cities– September 2011 [4]

The Poznań's geographical and economic location, both continentally and locally, on one of the most important transit routes connecting the western and the eastern part of Europe (halfway between Warsaw and Berlin) gives the city a privileged position. The city's economic, trade and business as well as residential function brings a necessity of intense development of transportation. At the same time the above-mentioned phenomena (economic development, suburbanization) not only result in longer travels but also generate new that arise not only from the home-work-home, home-campus-home routines but also from other motives (e.g. those related to recreation). The need to realize trips combined with a rapid development of the motorization and a relatively easy access to individual means of transport (passenger car) have contributed to significant changes in the functioning of road transportation and a creation of a mobile society [5]. As of the moment that passenger car became, as we call it, a common good, it is little wonder that in 2010 the basic means of transport, apart from public transit, was this very vehicle type. The share of vehicle traffic in overall transit in Poznań amounts to over 50% [6].

MOTORIZATION INDEX
FOR THE CITY OF POZNAŃ

Recent social-economic changes in Poland have been accompanied by a dynamic growth of the number of vehicles driving on our roads [7]. According to the data of Central Office of Statistics (GUS) published in 2011 [8], the number of vehicle in the years 2005-2009 grew by 30% (from 12 339 353 units to 16 494 650 units). For the evaluation of the motorization level of society a motorization index is used that determines the number of vehicles per 1000 inhabitants. In the case of passenger cars, on average national scale this index currently amounts to 433, which, in comparison to the index obtained in 2005, constitutes a growth by 30%.

Referring the above national data to Poznań, the growing trend of the motorization index greatly exceeds the national average. According to the available data related to the number of registered vehicles in Poznań in the period from 2005 to 2009 we can observe an almost 40% growth in the motorization index. At the end of 2010 it reached a value of 516 (fig. 3). A particularly visible dynamic growth of the number of registered vehicles took place in the period from 2004 to 2008 i.e. the moment Poland became the EU member and an avalanche of vehicles were imported from the EU until the economic crisis in 2008. In this period the motorization index in Poznań grew almost by half. Indeed, after 2008 further growth of vehicles registered in Poznań continued, yet the value of this index was not this dynamic anymore. We can add that in 2010 in the city there were 370.000 vehicles registered, 2.6% more than the previous year [6].

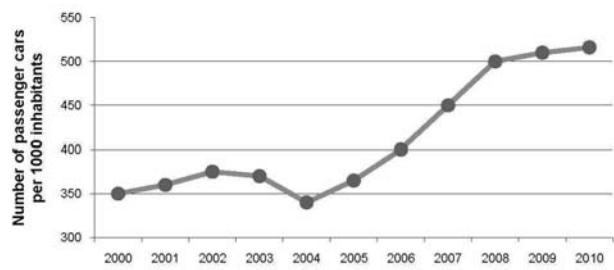


Fig. 3. Motorization index in Poznań in the years 2000-2010 [6]

The most up-to-date motorization indexes can be determined based on the data from Central Vehicle and Driver Register (CEPIK) [9]. The motorization index referred to the number of passenger cars (285 777 units as of 31.05.2011) at the assumption of 550 000 inhabitants in Poznań was 520 and in the poviát of Poznań (110 925 cars as of 31.05.2011 and 309 000 inhabitants): 359 [10]. Assuming for the calculations not only passenger cars but all the vehicles registered in Poznań the index would be higher and would amount to 652 (for 359 050 vehicles).

The value of the motorization index is subject to continuous changes. Each day new vehicles are registered and other are declared off the road. The lack of detailed

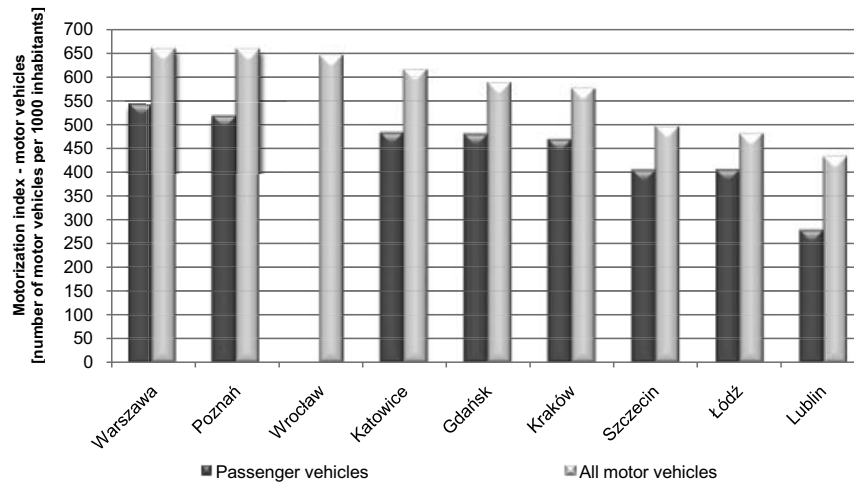


Fig. 4. Comparison of the motorization index in the largest Polish cities – data as of 2010 [12]

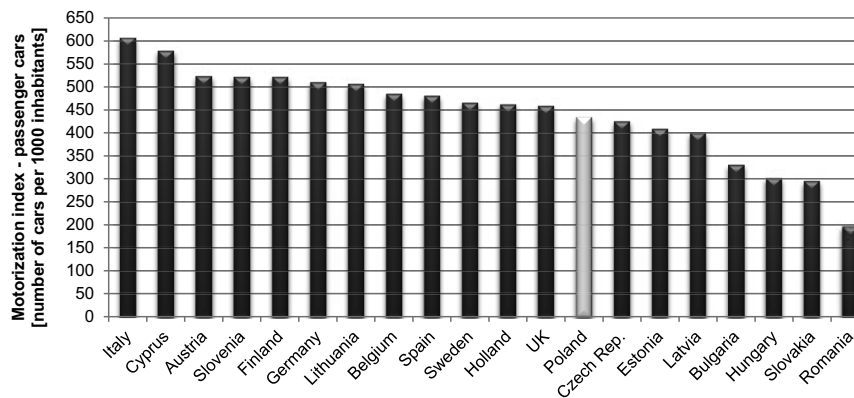


Fig. 5. Comparison of the motorization index (passenger cars only) in EU countries [8]

information on vehicles that are off the road and still recorded in the CEPIK record (physically not existing) significantly influences the state of knowledge on the actual state of motorization. Hence, small differences may appear in the available source data [9, 10, 11, 12]. What is more, the index value is also influenced by the assumed number of inhabitants. The differences between the indexes determined for Poznań based on the available sources respectively: 520 (CEPIK) and 516 (Department of Motor vehicles) can be deemed as insignificant.

It is worthwhile to compare the motorization indexes for Poznań with the available data for the largest cities of Poland and the average values for the EU member states (fig. 4 and 5). The analysis of the data leads to a conclusion that Poznań, immediately after Warsaw, has the largest number of passenger cars per 1000 inhabitants. Besides, the values of the motorization index for Poznań is comparable or even higher than the average values of this index for such EU member states as Austria, Belgium, Finland or Germany. Such a high level of motorization in Poznań has several reasons: low unemployment rate, relatively low prices of passenger vehicles in the second hand market, still insufficient, yet improving quality of public transit, growing but still acceptable cost of traveling (expressed in time and money) and the comfort of the users.

MOTORIZATION STRUCTURE IN THE CITY OF POZNAŃ

GENERAL INFORMATION

The largest group at 80% in the motorization structure of Poznań is passenger cars (Fig. 6). Another group is trucks (13%), motorcycles (3.2%) and mopeds (1.7%). Due to a very small share in the overall structure the last group referred to as 'other' (2.2%) contains: trailer trucks (0.9%), farm tractors (0.8%), buses (0.3%) and special heavy-duty vehicles (0.2%).

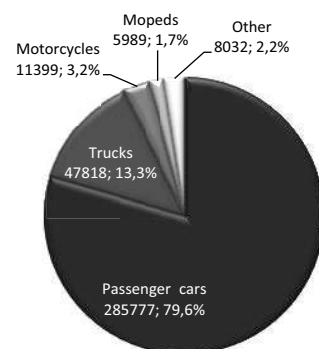


Fig. 6. Motorization structure of the city of Poznań as divided into type of vehicle and seen in per cent and quantity in 2011

The vehicle structure in Poznań in terms of year of manufacture and registration in the Department of Motor Vehicles has been presented in figure 7. Analyzing the presented data from 2004 we can observe a growing trend of the registered vehicles. In the years 2004-2008 this number doubled. In the analyzed period the number of registered vehicles was the highest in 2008. At the same time there was the highest number of newly registered vehicles, hence the highest number of vehicles from this year in Poznań. A clearly decreasing trend of the number of vehicles manufactured and registered in 2009 should probably be attributed to the economic crisis.

Another visible trend is that from 2004 the number of vehicles from a particular year of manufacture is lower than the number of vehicles registered in this particular year. Beginning from 2004 came a gradual increase in the number of registered vehicles, however, more pre-owned vehicles than new ones were registered. It is noteworthy that in 2004 as compared to the previous year the growth

in the number of registered vehicles was over 50%. Such a high dynamics can be attributed to the avalanche of vehicles imported from the EU member states following the accession of Poland to the European structures in May 2004. The growing trend maintained until 2008 and then from 2009 we can observe a reduced number of registered vehicles in Poznań. The reason for this could have been the economic crisis or bad exchange rates – Euro in particular.

AUTOMOTIVE STRUCTURE IN POZNAŃ
FOR PASSENGER CARS ANALYZED
IN TERMS OF THEIR AGE

The total number of registered passenger cars in Poznań as of 30.11.2011 amounted to 285 777 units. The structure of passenger cars in Poznań in terms of year of manufacture and year of registration in the Department of Motor Vehicles has been presented in figure

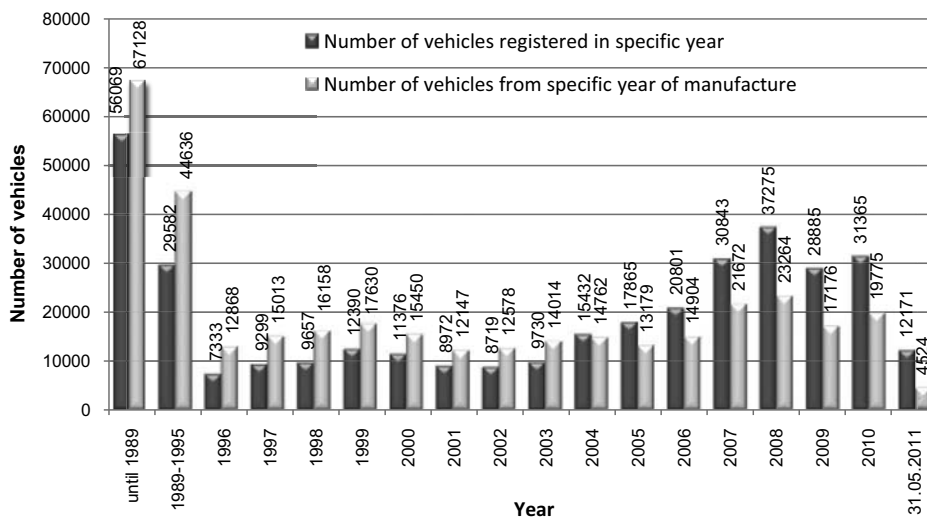


Fig. 7. Automotive structure in the city of Poznań as divided into year of manufacture and year of registration in the Department of Motor Vehicles in Poznań

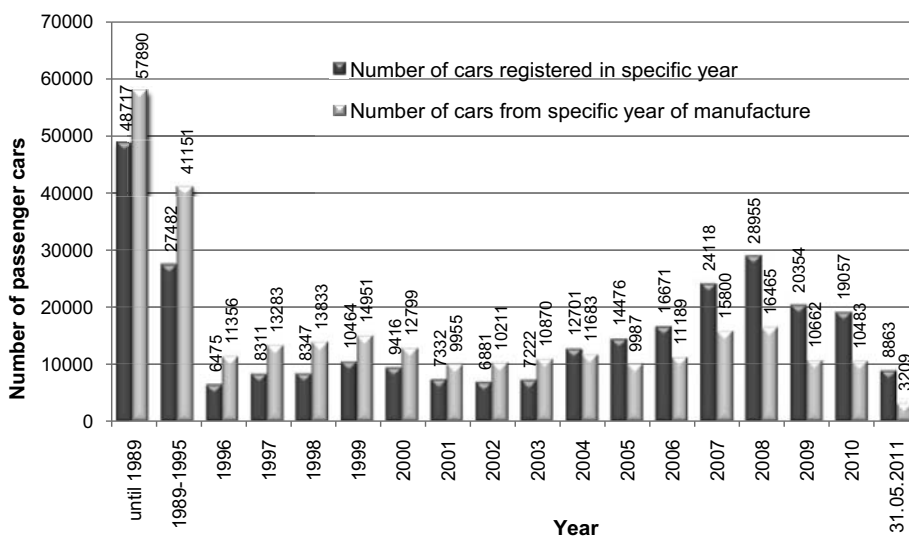


Fig. 8. Automotive structure of passenger cars in the city of Poznań as divided into year of manufacture and year of registration in the Department of Motor Vehicles in Poznań

8. When analyzing the presented data we can observe that the trend pertaining to the number of manufactured and registered passenger vehicles in Poznań is similar to the trend pertaining to all the vehicles registered in the city. In the years 2004-2008 the number of registered vehicles grew by more than 100%. Also, the number of vehicles manufactured in 2008 is the highest and the passenger cars from this year of manufacture are the highest in number in the city. A numerous collective group of vehicles are the vehicles registered in the period until 1989. Due to their age and low probability of everyday use these vehicles are not a common sight in the streets of Poznań. Almost 60.000 vehicles are vehicles over 20 years old and approximately 100.000 vehicles are 16 years of age and older. When comparing the structure of all vehicles and passenger cars only we can observe that the drop in the total number of registered vehicles in 2009 as compared to 2008 resulted practically only from the drop in the number of passenger cars.

The data from Institute of Automotive Market Research (Samar) [13] indicate that from January to May 2011 in the country 68 567 new vehicles [11] and 267 437 imported pre-owned vehicles were registered [13], which gives a total of 336 004 registered vehicles. This means that almost every fourth vehicle registered in the country was a new one. In the meantime in Poznań 8 863 passenger vehicles were registered, which constitutes almost 3% of all registered vehicles countrywide.

In order to show the Poznań statistics against the average national statistics fig. 9 presents the share of passenger vehicles in individual age groups. Based on the data we can observe that the average number of vehicles registered in Poznań in the age group up to 2 years is clearly higher than the national average. This means the citizens of Poznań buy more new vehicles than the national average.

A further analysis of the data in figure 9 indicates that, basically for all analyzed groups the vehicles registered in Poznań are younger as compared to the average statistics on the national level. In the case of passenger cars in the age group of up to 5 years the ones registered in Poznań constitute 24% and on the national level it is merely 12%. At the same time vehicles in the age group of over 16 years it is 35% in Poznań and almost 42% on the national level.

In the case of trucks the situation is similar. Vehicles up to 5 years constitute as much as 54% of the total number of those vehicles registered in Poznań and on the national level this value is merely 16%. The situation of trucks in the age group of over 11 years is quite contrary – in Poznań it is only 25% of the total number of heavy duty vehicles registered while on the national scale it is as much as 61%.

The age structure of the buses registered in Poznań and countrywide is similar to passenger cars with the only difference that the share of the vehicles in the age group above 16 years on the national scale is almost on the level of 60% whereas for Poznań this value is 42%.

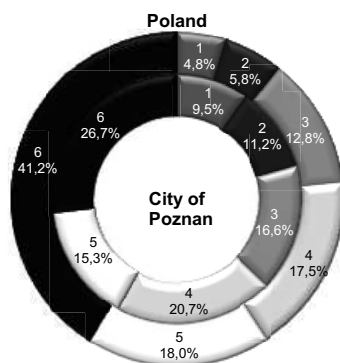
a) Passenger cars



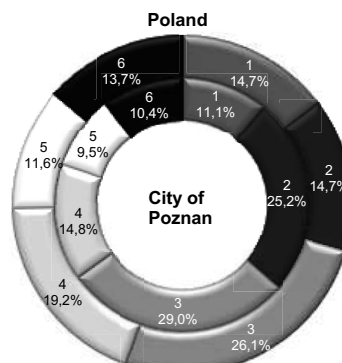
b) Trucks



c) Buses



d) Trailer trucks



■ 1: up to 2 years ■ 2: 3-5 years ■ 3: 6-10 years
 ■ 4: 11-15 years ■ 5: 16-20 years ■ 6: 21 years and more

Fig. 9. Comparison of average vehicle shares in individual age groups in Poznań and countrywide

As for the trailer trucks, the general trend is similar to the other groups under analysis with the exception of the youngest vehicles (up to 2 years) that in Poznań are on the level of 11% while on the national scale it is almost 15%. The share of vehicles in the age group of up to 5 years in the total number of registered trailer trucks for Poznań is 36% while on the national scale it is almost 30%. Trailer trucks in the age group above 10 years constitute 35% in Poznań and over 44% on the national scale.

The above described status, i.e. a much younger vehicle fleet in individual categories could be a confirmation of the economic situation of Poznań and its citizens, which as mentioned earlier is one of the best in the country.

AUTOMOTIVE STRUCTURE OF THE CITY OF POZNAŃ FOR PASSENGER CARS – CITIZEN PREFERENCES

The preferences of the citizens of Poznań in terms of engine capacity, determined based on the number of passenger cars registered in the Department of Motor Vehicles in individual engine displacement categories, have been shown in figure 10. In the percentage structure of the passenger cars for engine capacity in Poznań small and medium sized (compact) vehicles dominate (engines of the capacity of 651 to 1600 cm³ represent 64% of the total number of registered cars). The vehicles of engine capacity from 1601 cm³ to 2000cm³ constitute every fourth car registered in Poznań. The smallest group are cars of the engine capacity above 2501 cm³ (total 4%).

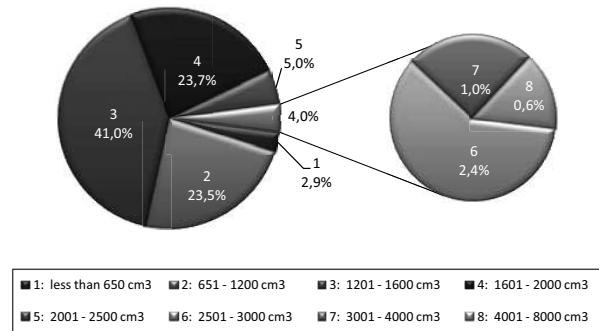


Fig. 10. Passenger cars registered in Poznań as divided into engine capacity [cm³]

The drivers' preferences in terms of fuel and engine type in vehicles registered in Poznań have been shown in figure 11. From the data it results that the preferences of the drivers in Poznań in the above categories are spark ignition engines.

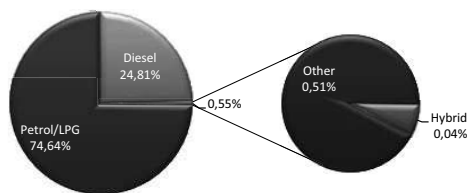


Fig. 11. Passenger cars registered in Poznań as divided into type of fuel

As a complement to the already presented analyses figure 12 presents a percentage structure of vehicle makes owned by the citizens of Poznań. For the sake of the analysis the vehicles of the makes that were registered in number not exceeding 10 000 units have been classified as 'other'.

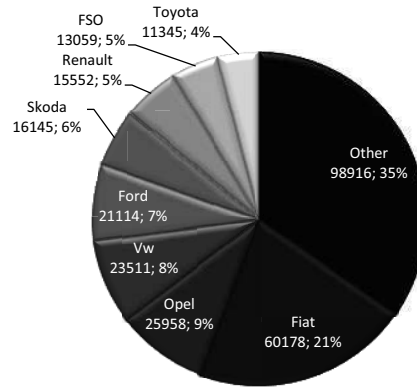


Fig. 12. The number of individual passenger car makes registered in Poznań

It is noteworthy that the most popular in the city of Poznań are the cars manufactured by Fiat that constitute over 21% of all registered vehicles. Further, the most popular makes in Poznań registered in the number of over 10.000 units are: Opel (9%), Volkswagen (8%), Ford (7%), Skoda (6%), Renault (5%), FSO (5%) and Toyota (4%). A large collective group is cars classified as 'other' (35%). In this group belong various makes whose individual share is miniscule as compared to the total number of registered vehicles. We should also remember that the database contains vehicles that probably do not exist anymore. For legal reasons it is impossible for these vehicles to be deleted from the database. In this context we need to indicate the vehicles manufactured by FSO – 5% of all passenger cars. A similar group are vehicles that are a rare sight in the streets of Poznań. These are: Trabant (1484 units), Wartburg (1329 units), Lada (1295 units), Zastava (956 units), Moskwicz AZLK (328 units). Beside the above indicated makes classified as 'other' there is another group that belongs to this classification due to its little number – luxury, niche vehicles: Lexus (374 units), Jaguar (359 units), Porsche (310 units), Pontiac (107 units), Cadillac (46 units), Lincoln (34 units), Bentley (13 units), Ferrari (9 units), Rolls Royce (5 units), Aston Martin (4 units) and Lamborghini (3 units).

CONCLUSIONS

The analysis of the here presented data allows a statement that the automotive structure in Poznań in most cases is positively far from the average values for Poland. In the case of the motorization index we obtain values that are higher than the average and the age of the registered vehicles is lower than the average values for the whole country. We should observe that the motorization

index for Poznań is comparable to values characteristic of better-developed EU member states. Such a situation in combination with a constantly growing trend and shortcomings in the infrastructure (e.g. park and ride lots or incomplete system of bypass roads) results in that the traffic conditions gradually deteriorate (higher congestion, costs of transport etc.). This unfortunately results in higher exhaust and noise emissions at the same time influencing the life of the citizens. A positive phenomenon that to some extent could compensate the growing traffic congestion and thus the growing pollution could be the higher (as compared to national average) number of vehicles in the age group of up to 5 years meeting at least the EURO-4 standard.

A constantly growing motorization index is a result of many factors. The most important seem to be: a relatively good (as compared to other cities) economic situation of the citizens of Poznań, advancement of the automotive industry and easy access to passenger vehicles as a means of transport, comfort and a common cult of a vehicle as a transport means, acceptable costs of traveling and suburbanization being a natural stage of the city development. The above-mentioned phenomena, with Poznań still remaining as the center for work, education and recreation leads to a realization of new traveling objectives.

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OBRZĄD MOTORYZACYJNY POZNAŃ NA TLE INNYCH MIAST ORAZ WSKAŹNIKÓW OGÓLNOKRAJOWYCH

Streszczenie. W ślad za dynamicznym rozwojem motoryzacji oraz zmianami gospodarczymi zachodzącymi na przestrzeni ostatnich 20 lat w Polsce znaczącym zmianom uległy również potrzeby transportowe oraz mobilności mieszkańców. Zwiększony popyt na realizację podróży oraz łatwy dostęp do indywidualnego środka transportu, jakim jest samochód osobowy stawia Poznań w czołówce pod względem wartości wskaźnika motoryzacji wśród największych miast w Polsce. W artykule dokonano analizy stanu motoryzacyjnego Poznania na podstawie danych statystycznych z Centralnej Ewidencji Pojazdów i Kierowców, Wydziału Komunikacji Urzędu Miasta Poznania oraz publikowanych przez Główny Urząd Statystycznych. Zaprezentowano syntetyczną analizę sytuacji panującej w Poznaniu na tle największych miast w Polsce oraz średniej sytuacji w kraju. Przedstawiono także analizę preferencji mieszkańców Poznania w zakresie pojemności silnika, rodzaju stosowanego paliwa i napędu oraz najczęściej wybieranych marek samochodów osobowych.

Słowa kluczowe: miasto Poznań, motoryzacja, statystyka, społeczeństwo mobilne.