



Prediction and analysis of motorization rate development in chosen districts of Slovak Republic

J. ONDRUŠ^a, J. DICOVÁ^b

^a UNIVERSITY OF ZILINA, Faculty of Operation and Economics of Transport and Communications, Department of Road and Urban Transport, Univerzitná 1, 010 26 Žilina, Slovakia

^b UNIVERSITY OF ZILINA, Faculty of Management Science and Informatics, Department of Management Theories, Univerzitná 1, 010 26 Žilina, Slovakia

EMAIL: jan.ondrus@fpedas.uniza.sk

ABSTRACT

Currently in many countries come to the high increase of number of passenger cars. Such increase brings also many problems which arise in particular in residential areas and on roads out of residential areas since they are not able to ensure reliable and continuous traffic on these roads. The paper presents the analysis, the prediction and issue of motorization rate comparison in particular districts of the Slovak Republic.

KEYWORDS: district, passenger car, motorization rate, transport, prediction

1. Introduction

Transport is one of the factors that influences in an extremely relevant way the life of whole society so in rural zone as in town residential area and influences their future development. Spurt growth of motorization has not been proportional to communications development, parking spaces and equipment needed for car service. That is why the parking spaces problems appear more and more often with cities development. This problem is connected with the ability of cities to provide their transport servicing and availability, as well as the environmental quality on the other side [4].

Dealing with the motorization development problem in our country is a necessary need nowadays from various points of view. Actual growth of the number of passenger cars and performances of individual motorization brings negatives in the form of congestions and negative influence to the environment. On the other hand it is a source of state budget income from driving fuel sales, car sales, felleable taxes and other services connected with motorization [1].

Questions of development and reaching the suitable saturation of individual transport needs of citizens belong to very actual questions, especially concerning the living standards, way of life and

the environment. An important factor in this area is the relationship to cars and motorization development globally. Opinions concerning passenger car are various and reflect political and economical situation in society. Considering the orientation of the Slovak economy towards free market, the question of differences in social structure becomes negligible and the questions concerning way of life as well as the economical ones become more important [1].

Continually there is a need to state the basic fact, e.g. that the Slovak Republic belongs to countries with the highest share of passenger cars produced per person in a year [4].

2. Motorization rate in the Slovak Republic

Introduction of this chapter focuses on the degree of motorization, its development and prediction from the regional towns point of view, which are districts towns as well (Bratislava, Trnava, Trenčín, Nitra, Žilina, Banská Bystrica, Prešov a Košice), and from the point of view of districts towns with over 50 000 inhabitants (Prievidza, Martin, Poprad) and the Slovak Republic itself. And it also concerns the

number of inhabitants in various regions and districts of the whole Slovak Republic.

As we can see from table 1, in most regions there is an annual growth of inhabitants number until 2010. It is interesting that in 2011 there was the first drop of Slovak inhabitants number since 2001 compared with 2010, exactly 30 951 inhabitants. This tendency naturally influenced most regions except for Košice, Prešov and Banská Bystrica region. The largest growth of inhabitants number since 2001 initiated in Košice region by 3.44 %, exactly from 766 650 people in 2001 to 792 991 people in 2011. On the contrary, the most important drop of inhabitants number since 2001 initiated in Nitra region by 3.19 %, exactly from 712 312 people in 2001 to 689 564 people in 2011. The whole inhabitants number in Slovak Republic grew until 2011 about 25 371 people, e.g. 0.47 % compared with 2001 [4].

Table 1. Development of the number of inhabitants in various regions in the Slovak Republic [7]

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	* Increase, decrease [%]
The number of inhabitants												
<i>Bratislava region</i>	599 042	599 736	599 787	601 132	603 699	606 753	610 850	616 578	622 706	628 686	606 537	+ 1,25
<i>Trnava region</i>	550 918	550 911	552 014	553 198	554 172	555 075	557 151	559 934	561 525	563 081	555 509	+ 0,83
<i>Trenčín region</i>	604 917	603 494	602 166	601 392	600 386	599 847	599 831	599 859	599 214	598 819	594 186	- 1,77
<i>Nitra region</i>	712 312	711 002	709 752	709 350	708 498	707 305	706 758	706 375	705 661	704 752	689 564	- 3,19
<i>Žilina region</i>	692 434	693 041	693 499	694 129	694 763	695 326	695 698	696 347	697 502	698 274	689 601	- 0,41
<i>Banská Bystrica region</i>	661 343	660 110	658 953	658 368	657 119	655 762	654 668	653 697	653 186	652 218	660 128	- 0,18
<i>Prešov region</i>	791 335	793 182	794 814	796 745	798 596	800 483	801 939	803 955	807 011	809 443	815 806	+ 3,09
<i>Košice region</i>	766 650	767 685	769 068	770 508	771 947	773 086	774 103	775 509	778 120	780 000	792 991	+ 3,44
Slovak Republic	5 378 951	5 379 161	5 380 053	5 384 822	5 389 180	5 393 637	5 400 998	5 412 254	5 424 925	5 435 273	5 404 322	+ 0,47

* There is an overall increase (decrease) in 2011 comparing with 2001

There is also an interesting view within various districts, where we can see similar development as in different regions. As we mentioned in the introduction, 11 districts towns were chosen. In all the solved regions there was a minimum growth until 2011, let us say drop of inhabitants number except for Bratislava, Nitra, Prešov and Košice district. In 2011 there was the largest annual drop of inhabitants number in Bratislava district (annual drop of 19 609 inhabitants), on the contrary the largest growth initiated in Košice district (annual growth of 6 802 inhabitants). The largest growth of inhabitants number since 2001 initiated in Prešov district, about 4.72 %, exactly from 162 173 people in 2001 to 169 828 people in 2011. On the contrary, the largest drop of inhabitants number since 2001 initiated in Bratislava district, about 3.48 %, exactly from 428 094 people in 2001 to 413 192 people in 2011.

Table 2. Development of the number of inhabitants in several districts in the Slovak Republic [7]

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	* Increase, decrease [%]
The number of inhabitants												
<i>Bratislava district</i>	428 094	427 049	425 533	425 155	425 459	426 091	426 927	428 791	431 061	432 801	413 192	- 3,48
<i>Trnava district</i>	127 039	126 864	126 804	126 822	126 986	127 292	127 756	128 171	128 647	129 212	128 817	+ 1,40
<i>Trenčín district</i>	112 785	112 592	112 505	112 515	112 761	113 051	113 341	113 741	113 753	113 994	113 261	+ 0,42
<i>Nitra district</i>	163 565	163 548	163 599	163 764	163 768	163 802	164 091	164 365	164 597	165 011	159 422	- 2,53
<i>Žilina district</i>	156 405	156 539	156 670	156 869	157 407	157 679	157 787	158 029	158 433	158 771	154 596	- 1,16
<i>Banská Bystrica district</i>	111 946	111 747	111 504	111 419	111 186	110 983	110 982	110 908	110 979	111 029	111 180	- 0,68
<i>Prešov district</i>	162 173	162 658	163 102	163 743	164 331	165 059	165 613	166 223	166 905	167 616	169 828	+ 4,72
<i>Košice district</i>	236 036	235 509	235 281	235 006	234 871	234 596	234 237	233 659	233 880	233 886	240 688	+ 1,97
<i>Prevúca district</i>	140 285	139 950	139 616	139 502	139 238	139 127	139 442	139 639	139 627	139 535	137 819	- 1,76
<i>Martin district</i>	97 852	97 912	97 808	97 671	97 608	97 485	97 544	97 515	97 498	97 640	97 214	- 0,65
<i>Poprad district</i>	104 554	104 526	104 356	104 320	104 326	104 333	104 481	104 508	104 827	105 068	104 220	- 0,32
Slovak Republic	5 378 951	5 379 161	5 380 053	5 384 822	5 389 180	5 393 637	5 400 998	5 412 254	5 424 925	5 435 273	5 404 322	+ 0,47

* There is an overall increase (decrease) in 2011 comparing with 2001

An important background and indication that is connected with development of inhabitants number and characterizes the motorization rate is number of passenger cars in mentioned period.

It is well known that numbers of motor vehicles and passenger cars grow annually in every European country. This trend did not elude the Slovak Republic. Development of number of passenger cars in the Slovak Republic was a bit less striking than in case of motor vehicles, but important enough anyway. Actual motoring development in the Slovak Republic can be characterized as developing in a dynamic way, where in last eleven years the number of passenger cars growth in the Slovak Republic initiated by 35.3 % on the average. The largest growth of the number of passenger cars since 2001 initiated in Prievidza district, about 46.04 % (e.g. 1.46 times), exactly from 29 845 passenger cars in 2001 to 43 585 in 2011. A very similar growth also initiated in Žilina district (growth by 45.99 %). The lowest growth of the number of passenger cars by 12.37 % appeared in Košice district, exactly from 68 083 passenger cars in 2001 to 76 506 in 2011. Development of the number of passenger cars in other districts is well arranged in table 3.

Even if the comparison of actual development of individual motoring shows that in the Slovak Republic the trade boom of certain level has been in progress already, there is a need to expect that in future the cyclic development will go on, even if the growths will be different, but softer.

Table 3. Development of the number of passenger cars in several districts in the Slovak Republic [5,6]

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	* Increase, decrease [%]
<i>Number of the passenger cars</i>												
<i>Braňovská district</i>	182 002	186 795	189 419	169 514	180 231	181 852	190 696	201 177	203 831	214 029	225 092	+ 23,68
<i>Trnava district</i>	35 501	36 436	37 240	33 841	35 799	37 028	39 952	42 646	44 066	46 252	48 533	+ 36,71
<i>Trenčín district</i>	28 666	29 421	30 070	26 542	28 907	29 068	31 097	33 418	34 310	35 812	37 577	+ 31,09
<i>Nitra district</i>	42 729	43 854	44 822	39 562	43 088	44 947	48 061	51 824	53 480	56 172	58 676	+ 37,32
<i>Žilina district</i>	35 502	36 437	37 241	32 871	35 800	38 433	41 702	45 026	46 778	49 322	51 829	+ 45,99
<i>Banská Bystrica district</i>	32 677	33 538	34 278	30 255	32 952	30 574	32 422	34 552	35 371	36 949	38 481	+ 17,76
<i>Prešov district</i>	35 173	36 099	36 896	32 566	33 968	34 780	37 380	40 489	41 659	43 631	45 812	+ 30,25
<i>Košice district</i>	68 083	69 876	71 419	63 037	66 455	62 478	65 751	69 883	71 157	74 004	76 506	+ 12,37
<i>Prievidza district</i>	29 845	30 631	31 307	27 633	30 096	32 750	35 758	38 724	39 888	41 883	43 585	+ 46,04
<i>Marina district</i>	20 008	20 535	20 988	18 525	20 176	21 663	23 508	25 179	26 052	27 429	28 783	+ 43,86
<i>Poprad district</i>	22 109	22 691	23 192	20 470	21 869	22 063	23 553	25 202	25 973	27 049	28 354	+ 28,25
Slovak Republic	1 292 843	1 326 891	1 356 185	1 197 030	1 303 704	1 333 749	1 433 948	1 544 888	1 589 044	1 669 065	1 749 271	+ 35,30

* There is an overall increase (decrease) in 2011 comparing with 2001

Table 4 issues from table 3, where the numbers of passenger cars are included, as well as companies passenger cars. These are passenger cars that are structurally built – because of the VAT costs sheet - with „separation skeleton” and with categorization of „N” group vehicle in technical licence. Statistically these vehicles are registered as cargo freight vehicles and not as passenger cars. And nevertheless most of them are used for private purposes and common private services. That is why these vehicles are counted to the whole number of passenger cars, where from the motorization rate has been counted later; let us say the equipment rate of passenger cars. After discussions with licencing authorities, these vehicles make 6 to 10 %-part, let us say the average 8 per cent for other calculations. Values in the table are mathematically approximated.

Table 4. Development of the general number of passenger and companies passenger cars in several districts in the Slovak Republic [5,6]

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	* Increase, decrease [%]
<i>Number of the passenger cars</i>												
<i>Braňovská district</i>	196 562	201 739	204 573	183 075	194 649	196 400	205 952	217 271	220 137	231 151	243 099	+ 23,68
<i>Trnava district</i>	38 341	39 351	40 219	36 548	38 663	39 990	43 148	46 058	47 591	49 952	52 416	+ 36,71
<i>Trenčín district</i>	30 959	31 775	32 476	28 665	31 220	31 393	33 585	36 091	37 055	38 677	40 583	+ 31,09
<i>Nitra district</i>	46 147	47 362	48 408	42 727	46 535	48 543	51 906	55 970	57 758	60 666	63 370	+ 37,32
<i>Žilina district</i>	38 342	39 352	40 220	35 501	38 664	41 508	45 038	48 628	50 520	53 268	55 975	+ 45,99
<i>Banská Bystrica district</i>	35 291	36 221	37 020	32 675	35 588	33 020	35 016	37 316	38 201	39 905	41 559	+ 17,76
<i>Prešov district</i>	37 987	38 987	39 848	35 171	36 685	37 562	40 370	43 728	44 992	47 121	49 477	+ 30,25
<i>Košice district</i>	73 530	75 466	77 133	68 080	71 771	67 476	71 011	75 474	76 850	79 924	82 626	+ 12,37
<i>Prievidza district</i>	32 233	33 081	33 812	29 844	32 504	35 370	38 619	41 822	43 079	45 234	47 072	+ 46,04
<i>Marina district</i>	21 609	22 178	22 667	20 007	21 790	23 396	25 389	27 193	28 136	29 623	31 086	+ 43,86
<i>Poprad district</i>	22 878	24 506	25 047	22 108	23 619	23 763	25 437	27 218	28 051	29 213	30 622	+ 28,25
Slovak Republic	1 292 843	1 326 891	1 356 185	1 197 030	1 303 704	1 333 749	1 433 948	1 544 888	1 589 044	1 669 065	1 749 271	+ 35,30

* There is an overall increase (decrease) in 2011 comparing with 2001

Motorization rate is a parameter which tells us about the number of inhabitants of certain regional unit that strikes on 1 passenger car [2].

In following table 5 the motorization rate development in the Slovak Republic is registered, which dropped in last 11 years almost by 26 %, e.g. in 2001 there was 4,16 inhabitants per 1 passenger car, in 2011 already 3.09 inhabitants. The most remarkable percentual change in the motorization rate initiated in Prievidza district, which is naturally related to the largest development of the number of passenger cars in Prievidza district (table 3). It is the value of rate 4.35 to 2.93 inhabitant on 1 passenger car (drop by 33 %). A very similar drop of this indicator appeared also in Žilina district (drop by 32.3 %). On the contrary, the lowest percentual change in the motorization rate initiated in Košice district, by 9.26 %, which is connected with the lowest growth of the number of passenger cars in Košice district (table 3). The exactly value degree is 3.21 to 2.91 inhabitant on 1 passenger car. The lowest value of the motorization rate in 2011 was in Bratislava district (exactly 1.70), e.g. as if almost 3 inhabitants of Bratislava district owned 2 passenger cars. A lower value of the motorization rate than the Slovak Republic average value is in almost all districts except for Prešov, Poprad and Martin district. The highest value of the motorization rate in 2011 was in Prešov district (exactly 3.43).

Table 5. Development of the motorization rate in several districts in the Slovak Republic [own study]

Motorization rate	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	* Increase, decrease [%]
Bratislava district	2.18	2.12	2.08	2.32	2.19	2.17	2.07	1.97	1.96	1.87	1.70	-21.96
Trnava district	3.31	3.22	3.15	3.47	3.28	3.18	2.96	2.78	2.70	2.59	2.46	-25.83
Trenčín district	3.64	3.54	3.46	3.93	3.61	3.60	3.37	3.15	3.07	2.95	2.79	-23.39
Nitra district	3.54	3.45	3.38	3.83	3.52	3.37	3.16	2.94	2.85	2.72	2.52	-29.02
Žilina district	4.08	3.98	3.90	4.42	4.07	3.80	3.50	3.25	3.14	2.98	2.76	-32.29
Banská Bystrica district	3.17	3.09	3.01	3.41	3.12	3.36	3.17	2.97	2.91	2.78	2.68	-15.66
Prešov district	4.27	4.17	4.09	4.66	4.48	4.39	4.10	3.80	3.71	3.56	3.43	-19.60
Košice district	3.21	3.12	3.05	3.45	3.27	3.48	3.30	3.10	3.04	2.93	2.91	-9.26
Prievidza district	4.35	4.23	4.13	4.67	4.28	3.93	3.61	3.34	3.24	3.08	2.93	-32.73
Martin district	4.53	4.41	4.31	4.88	4.48	4.17	3.84	3.59	3.47	3.30	3.13	-30.94
Poprad district	4.38	4.27	4.17	4.72	4.42	4.39	4.11	3.84	3.74	3.60	3.40	-22.27
Slovak Republic	4.16	4.05	3.97	4.50	4.13	4.04	3.77	3.50	3.41	3.26	3.09	-25.72

* There is an overall increase (decrease) in 2011 comparing with 2001

The figure 1 diagrammatizes the motorization rate development in the Slovak Republic for separate years, where we can clearly see the dropping tendency (e.g. per 1 passenger car there is every year less and less inhabitants).

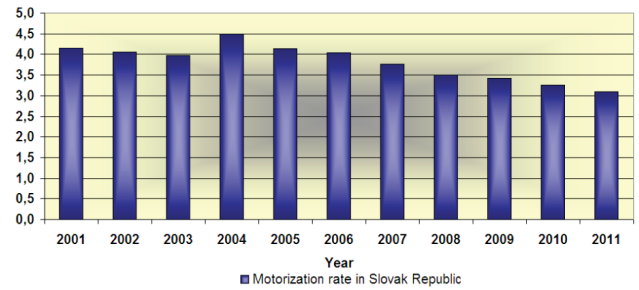


Fig. 1. Development of the motorization rate in several districts in the Slovak Republic

The experience says that the motorization rate, approximately 5.0 inhabitants per 1 passenger car starts to cause the first problems in society, as the transport safety, problems with parking and so on. Very serious problems appear already by the motorization rate of 2.5 inhabitant per 1 passenger car in urban transport. In peak hours congestions of vehicles are created at the entrances to larger towns and in the evening there are problems with parking places in residential areas with a constant lack of parking places and there is a real problem to park a passenger car [3]. If you see table 5 you will find out that there are districts in the Slovak Republic already with motorization rate lower than 2.5 in 2011 (Bratislava and Trnava district); let us say are close to that rate (Nitra, Banská Bystrica, Žilina and Trenčín district). It is necessary to state – and this is also alarming – the motorization rate from the Slovak Republic which gains value almost 3.0.

By actual development of passenger cars, actual living trends of inhabitants and their needs, when many families own more than 1 passenger car and with actual globalization, it is just a question of a short time when most of the districts, let us say larger towns in the Slovak Republic will gain this critical value of the motorization rate. Almost in every larger town, in central communal zones, let us say at neighbourhoods with parking places missing, and practically all the autonomies fight with the same difficulties. The problem becomes “chronical” already, which is not any more only the case of the capital city, Bratislava.

The causes of appearance of this state initiated in the 70s and 80s of the last century, when by a wide construction of blocks of flats did not count on such a huge growth of the motorization rate as it is happening in recent years (table 5 and 6). Another reason is the actual inconvenient and undersized technical norm STN 73 6110/Z1, which requires the construction of approximately 1.1 parking place per one flat.

Going on with construction of parking places on terrains with less and less green areas is also critical. Considering that nowadays already in most critical towns the green area per one inhabitant is from 11.5 to 13.5 m², where the limit is 11.0 m² per 1 inhabitant of town and by following construction of parking places the green areas would fall into level under the specific limits. Such a decline of green areas in neighbourhoods concerning the regional territorial system

of ecological stability and constantly maintainable development can not become the aim of regional autonomy [9]. And that is why there is a need to deal with this question properly and look for actual and possible solutions

A more precise expression of motorization the rate is by so called **the equipment rate of passenger cars**, which is much better corresponding to constant growth of this phenomenon. This indicator is defined as the number of passenger cars per 1 000 inhabitants [2].

Table 6. Development of the equipment rate of passenger cars in several districts in the Slovak Republic [own study]

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	% Increase, decrease [%]
Equipment rate of passenger cars	240,35	246,67	252,08	222,30	241,91	247,28	265,50	285,44	292,92	307,08	323,68	+ 28,66
Bratislava district	459,16	472,40	480,74	430,61	457,50	460,93	482,40	506,71	510,69	534,08	588,34	+ 28,14
Trnava district	301,81	310,18	317,18	288,19	304,47	314,16	337,74	359,35	369,94	386,59	406,90	+ 34,82
Trenčín district	274,50	282,21	288,66	254,77	276,86	277,69	296,32	317,31	325,75	339,29	358,32	+ 30,53
Nitra district	282,13	289,59	295,89	260,91	284,15	296,35	316,32	340,52	350,91	367,65	397,50	+ 40,89
Žilina district	245,15	251,39	256,72	226,31	245,63	263,24	285,44	307,72	318,87	335,50	362,07	+ 47,70
Banská Bystrica district	315,25	324,13	332,01	293,27	320,08	297,52	315,51	336,46	344,22	344,22	373,80	+ 18,57
Prešov district	234,24	239,69	244,31	214,80	223,24	227,57	243,76	263,07	269,56	281,13	291,34	+ 24,38
Košice district	311,52	320,44	327,83	289,69	305,58	287,63	303,16	323,01	328,59	341,72	343,29	+ 10,20
Prievidza district	229,77	236,38	242,18	213,93	233,44	254,23	276,95	299,50	308,53	324,17	341,55	+ 48,65
Martin district	220,83	226,51	231,75	204,84	223,24	240,00	260,28	278,86	288,58	303,39	319,77	+ 44,80
Poprad district	228,38	234,45	240,02	211,92	226,39	227,76	243,46	260,44	267,59	278,04	293,82	+ 28,66
Slovak Republic	240,35	246,67	252,08	222,30	241,91	247,28	265,50	285,44	292,92	307,08	323,68	+ 34,67

* There is an overall increase (decrease) in 2011 comparing with 2001

In following table 6 the development of the equipment rate of passenger cars in the Slovak Republic is noticed. As we can see, the value of the equipment rate of passenger cars for the Slovak Republic grew in last 11 years by almost 35 %, e.g. in 2001 it was 240.35 passenger cars per 1 000 inhabitants, in 2011 it was already 323.68 passenger cars. The largest percentual change in the equipment rate of passenger cars initiated in Prievidza district, which is naturally connected with the hugest development of the number of passenger

cars in Prievidza district (table 3). Exactly the change of values rate from 229.77 to 341.55 of passenger cars per 1 000 inhabitants (growth by almost 48.7 %). Also a very similar growth initiated in Žilina district (growth by 47.70 %). On the contrary, the lowest percentual change in the equipment rate of passenger cars initiated in Košice district and it was by about 10.20 %. The highest value of the equipment rate of passenger cars among all the districts in 2011 was in Bratislava district. The value was 588.34, which is higher by 81.76 % than the value for the Slovak Republic. The higher value of equipment rate of passenger cars than the value for the Slovak Republic is in almost all districts except for Prešov, Poprad and Martin district. The lowest value of the equipment rate of passenger cars in 2011 was in Prešov district (exactly 291.34).

The figure 2 graphically shows the development of the equipment rate of passenger cars in the Slovak Republic in separate years, where we can clearly see the tendency is growing (e.g. for 1 000 inhabitants there are more and more passenger cars every year).

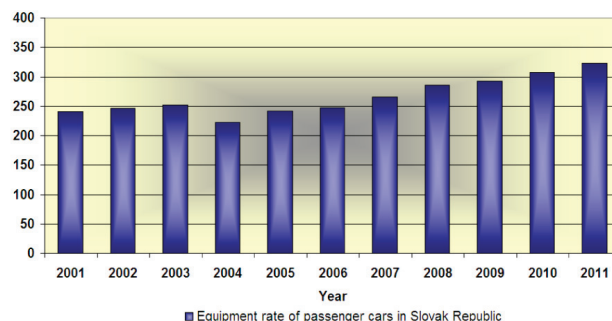


Fig. 2. Development of the equipment rate of passenger cars in several districts in the Slovak Republic

3. Development of the motorization rate in the Slovak Republic

If we consider the values of the motorization rate for separate years from table 5, the conclusion is that every year there is a drop in the motorization rate, which can be characterised by following graph at the figure 3. Here we can suppose that the tendency of values let us say the drop of the motorization rate responds to the tendency of exponential trend function. With the help of mentioned of regression equation the predicted motorization rates were calculated for the years 2015 and 2020 (values in yellow circles).

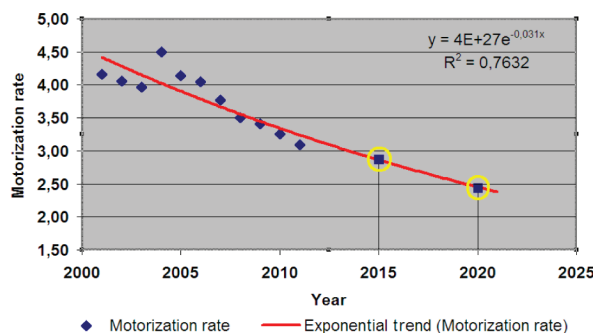


Fig. 3. Regression of the motorization rate development

Also the predicted future curve was calculated in the same way, value of indicator – the equipment rate of passenger cars. The calculated predicted values of the motorization rate and the equipment rate of passenger cars are transparently elaborated in table 7.

Table 7. Development of the motorization rate in the Slovak Republic [own study]

Year	Motorization rate	Equipment rate of passenger cars
2015	2,87	344,29
2020	2,46	389,34

In the whole world there are about 900 millions of passenger cars driving. 231 millions in 27 EU countries (EU-27), where approximately 1 750 000 of them are in the Slovak Republic. According to prognosis the number of passenger cars in the world until 2050 (in almost 40 years) will become more than a triple value – to 2.9 billion of passenger cars. According to some ratings, there should be more than a half million of new passenger cars on our roads until 2020 which would increase the indicator value to 400. We can all imagine what it would mean for the transport and parking places [3].

In all the countries that were accepted to EU recently it is evident that the level of transport development makes part of the economical growth of the country. It is hard to predict a strong economical growth that can create working places and welfare without powerful transport system making possible the realization of total and effective transport requests of inhabitants.

Transport requests are influenced by various factors. In personal transport the decisive factor is fast growth of the number of passenger cars and their using. The number of passenger cars in the Slovak Republic became a triple one in the last thirty years. Even if the level of passenger cars ownership in most EU countries is going to be constant soon, it is not the case of Eastern Europe where the ownership of personal vehicles is considered a certain „comfort and symbol of freedom“.

Mentioned comparison of actual development of individual motoring in the Slovak Republic shows that the conjuncture of certain level is being realized already. We can probably expect that the cyclic development will go on in the future, even if the growths will be different, more reasonable. This tendency of development can also be supposed in other states with lower level of passenger cars equipment.

Until 2015 the number of passenger cars will rapidly grow in EU and stabilization of equipment level for inhabitants by passenger cars in joined countries may be expected in several years, for sure after the year 2020.

In the period of autonomy of the Slovak Republic the motorization rate does not reach the level of most European countries and also stays backwards in comparison with the countries of the Vysegrad Four or some Balkan countries. The equipment rate of passenger cars in 2009 in the Slovak Republic was 293, that represents about 62 % of average value in that year for EU. States as Poland and Czech Republic approached

to this average value, Austria reached a much higher value than the EU average. In table 8 there is a well arranged schedule of the development of this indicator for the Slovak Republic in comparison with other states and the EU average.

Table 8. Development of the motorization rate in the Slovak Republic comparing with several EU states [8]

	2009	2008	2007	2006	2005	2004	2003	2002	2001
Equipment rate of passenger cars	293	285	266	247	242	222	252	247	240
<i>Slovak Republic</i>	433	422	383	351	323	314	294	288	275
<i>Poland</i>	522	515	513	509	507	505	500	494	521
<i>Austria</i>	424	426	416	401	387	374	363	357	344
<i>Czech Republic</i>	473	470	463	455	450	448	446	444	437
<i>EU</i>									

4. Conclusion

Motoring development influences the growth dynamics of inhabitants mobility. This fact brings solutions as maintaining actual level of public mass transport and how to influence the transport development in an effective way. There are various possibilities how to reach this ambitious aim, but not all the solutions are to be realized soon so that no traffic jams appear and overcharges of some road segments.

It is alarming that in spite of the motorization rate „lag“ comparing to average values of other states and the EU average, huge problems appear in all larger towns of the Slovak Republic with providing static transport (in towns, their centres or neighbourhoods) under the condition of keeping the best possible state of the environment.

As we mentioned before, even if in statistic comparison the Slovak Republic does not even reach the EU average, it is important to know how estimate the future motorization rate or the tendency of this development mainly because of motoring and transport development, providing the transport operation, maintenance of communications and mainly organization of static transport.

Acknowledgements

This contribution is the result of the project implementation: **Centre of excellence for systems and services of intelligent transport II**, ITMS 26220120050 supported by the Research & Development Operational Programme funded by the ERDF.

Bibliography

- [1] FAITH, P.: Automobilizmus ako faktor mobility = Motoring as a mobility factor. In: Perner's Contacts: elektronický odborný časopis o technológii, technice a logistice v doprave. - ISSN 1801-674X. - 2008. - Roč. 3, č. 5 mimoriad. číslo (2008), s. 90-97.
- [2] GOGOLA, M.: Porovnanie stupňa automobilizácie vo vybraných štátoch EÚ = The comparison of motorisation rate in choosed countries EU. In: Perner's Contacts: elektronický odborný časopis o technológii, technice a logistice v doprave. - ISSN 1801-674X - ISSN 1801-674X. - 2010. - Roč. 5, č. 3 (2010), s. 59-65.
- [3] KUTZBACH, M. J.: Motorization in developing countries: Causes, consequences, and effectiveness of policy options. Journal of Urban Economics, Volume 65, Issue 2, March 2009, Pages 154-166, ISSN: 0094-1190.
- [4] ONDRUŠ, J., PALO, J.: Analýza stupňa motorizácie v krajských mestách Slovenskej republiky. In: Doprava a spoje: ISSN 1336-7676. - 2012. - Č. 1 (2012), s. 283-288.
- [5] The total number of registered vehicles in Slovak Republic, in 31. 12. 2011, Ministry of Interior of the Slovak Republic –
- [6] <http://www.minv.sk/?celkovy-pocet-evidovanych-vozidiel-v-sr>
- [7] Ministry of Transport, Construction and Regional Development of the Slovak Republic, www.telecom.gov.sk/index/index.php
- [8] The Statistical Office of the Slovak Republic - www.statistics.sk
- [9] <http://epp.eurostat.ec.europa.eu/tgm/graph.do?tab=graph&plugin=1&pcode=tsdpc340&language=en&toolbox=data>
- [10] www.trnava-live.sk/2012/02/15/v-trnave-chyba-vyse-9-tisic-parkovacich-miest-ake-su-vyhliadky-do-buducnosti/ (accessed 18.08.2013)