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## Conference Paper

# The changing role of the road traffic in the course of time

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# **The Changing Role of the Road Traffic in the Course of Time<sup>1</sup>**

**by Gábor Szalkai**

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## **Traffic Censuses in Hungary**

Traffic counts have been conducted worldwide for over 160 years. In Hungary the first traffic survey on the national scale took place already 140 years ago. Technological and financial reasons made these necessary as the required amount of surface cover material for road maintenance depended on the volume of traffic, therefore the traffic load on roads had to be known to ensure the financial assets for maintenance.

In the course of the 19<sup>th</sup> century, traffic counts on national public roads were performed twice in Hungary. Their history, not to mention the sheer fact of the rare occurrence, has been hitherto virtually unknown in even professional circles. Research has revealed only partial results, the main reason for which was that after conducting the counts, the findings were just partially or not at all published. The investigation of the results was carried out by my research in the Hungarian National State Archives (abbreviation: MOL) and in the transylvanian branches of the National Archives of Romania (abbreviation: DJAN).

Following the geopolitical changes in the region, much of the territory of former Hungary was divided between Czechoslovakia, Poland, Romania, Yugoslavia, Italy and Austria in 1920. As a result of the ever since occurred alteration in the borders this publicized data provide facts for the History of transport in Slovakia, Poland, Ukraine, Romania, Serbia, Croatia, Slovenia and Austria.

The results of the counts in the 20<sup>th</sup> century are accessible without archive research. There had been two traffic counts between the world wars. After World War II cyclical counts were put in effect first every 7, later every 5 years.

The fall of Communism has brought that system to an end. The present “rolling” count system was installed in 1995, in which, apart from the continuously operating automatic stations, the traffic volume of the roads are measured every five years. In this sense each year one fifth of the national network is surveyed, while the traffic of the remaining roads is extrapolated according to the surveyed trends.

## **The relationship between the public road and railway networks in the 19th century**

In the late 19th century traffic conditions in the European continent were determined by the expansion of the railways. Alongside the gradually developing railway network the role of the road traffic was transformed in a way that on a Historical timescale for a short time it became of secondary importance in comparison with the rail mode of transport.

In Hungary these processes came in effect with a significant delay in relation to Western Europe as a result of the historical fact that until the Austro-Hungarian Compromise in 1867 the development of the railway network was carried out in a protracted way and was determined by the interest of the Habsburg Austrian state. Following the compromise and the restoration of the Hungarian self government the development of railway network accelerated and as a result of this acceleration the future of the public road network was put on the agenda.

The role of the technically inferior horse drawn traffic became doubted beside the rapidly expanding railway network. The question on numerous occasions was put on the agenda of the Houses of Parliament for several years. The main argument was the different views on maintaining and developing the feeder roads and the public roads that ran parallel to the new railway lines. According to some viewpoints the period of public roads had terminated and as a consequence their maintenance and development is not remunerative investment in comparison with the construction of railway lines and the parallel infrastructure required extreme regional concentration of the available sources. [1] Some other conceptions testified more rational and wider prospective in laying the emphasis on the complementary roles of the two modes of transport as a result of their different characteristics. Since the direct effect of the railways was noticed only in a narrow zone alongside the railway line, maintaining and developing the public road network on which the cargo and passengers hauled on the railway line were distributed and providing accessibility to the settlements without direct railway connection was of primary national interest. Also logistic and military arguments reinforced the importance of the parallel road network. The railway lines are more exposed to be rendered unserviceable than the roads and for short distance the road traffic was more advantageous even in that age due to the required time for wagon loading. [2]

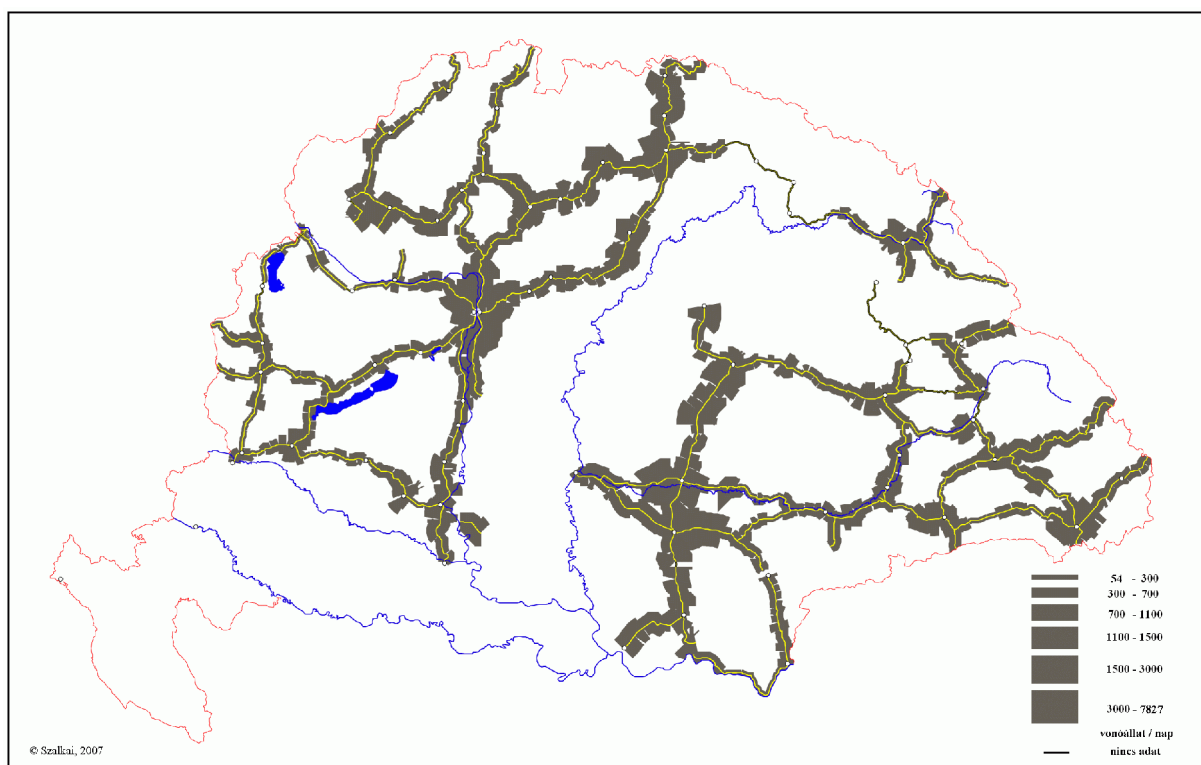
After the Austro-Hungarian Compromise, the two conceptions ruled alternately, however in long term the military notion gained power in favour of the development of the public road network. The development of the road network required the classification of the public roads on the basis of their traffic volume. Due to this necessity the first road traffic census was carried out in Hungary between 1869 and 1876, the second in 1894.

### The changing role of public road traffic in the 19th century

Within the first counting period the results of the 1870/71 and 1874 counts have been revealed by research carried out in the National Archives of Hungary. The number of state roads were 42 with the total length of 6030 km in 1874. In the course of the examination period the length of “validity sections” decreased from 12 km to 7,2 km, the countrywide general value of the daily traffic decreased from 684 hauling animals to 720 hauling animals. [3, 4] (Map No.1)

Map No.1

The traffic of state roads in the Kingdom of Hungary in 1874



Source of data: [4]

The results show minor traffic load in the western part of the country and heavier traffic load in the eastern part. It can be observed on the map that the peak traffic is closely related to the urban mesh, provided that the highest traffic was observed in the surrounding of the cities, which is a verification fact to the accuracy of the count. In 1874 the roads with the highest traffic were situated in the vicinity of Pest-Buda (now Budapest) and Brassó (*Braşov*, RO), however there was outstanding traffic in the environs of several cities in Eastern Hungary such as Arad (RO), Temesvár (Timișoara, RO) and Kassa (*Košice*, SK).

In comparison with the heavy traffic roads in Transylvania and Northeastern Hungary, the roads running in Transdanubia and Northwest Hungary had produced minor daily traffic. In the Transdanubia region, excluding the traffic focused to Buda, only significant traffic occurred only in the environs of Mohács and Pécs, while in the northwestern region only the roads leading to railway settlements showed traffic over the average.

On the contrary to the local factors the effect of the railway development to the road traffic has to be examined on national level. The role of the road network on several occasions became feeder traffic closely connected to the railway stations. The railway played primary role on the Hungarian great plain (Alföld), where there were no state roads at that time, the existing state road network only connected the major towns (Szeged, Debrecen) on its periphery to the inner regions of Transylvania. The northwestern counties were also connected to the national transport network only by railway lines. In that region the state roads terminated at the major railway stations or at major river ports providing similar connection to navigation.

In the examination period altogether 12 new railway lines were opened parallel to state roads. Among those roads 7 produced increasing carriage traffic in spite of the railway line, while on 5 roads the traffic started to decline. It revealed that the changes in road traffic were influenced by complex factors and there was no clear trend on a short timescale after opening a parallel railway line.

## *The traffic census in 1894*

The conception raised as early as in 1870's namely that the in order to classify the roads according to the traffic volume is not sufficient to count only on state roads, was only put to effect in the 1890 decade. According to the original plans the Ministry of Transport was to examine the state roads only, but finally revised their standpoint. Therefore in 1893 the first national traffic count was ordered in which the regional (county) roads were included the census. By the achieved result the classification of roads according the traffic volume became possible.

The so far known only source indicating the results of the 1894 traffic count, however only the state roads, is the map published by the Royal Hungarian Ministry of Commerce in 1895 under the title „Traffic Map of the State Roads in Hungary edited on the basis of the 1894 count”. (Map No. 2) The average daily traffic is shown by the number of hauling animals.

### Map No. 2

#### The traffic of state roads in Hungary in 1894

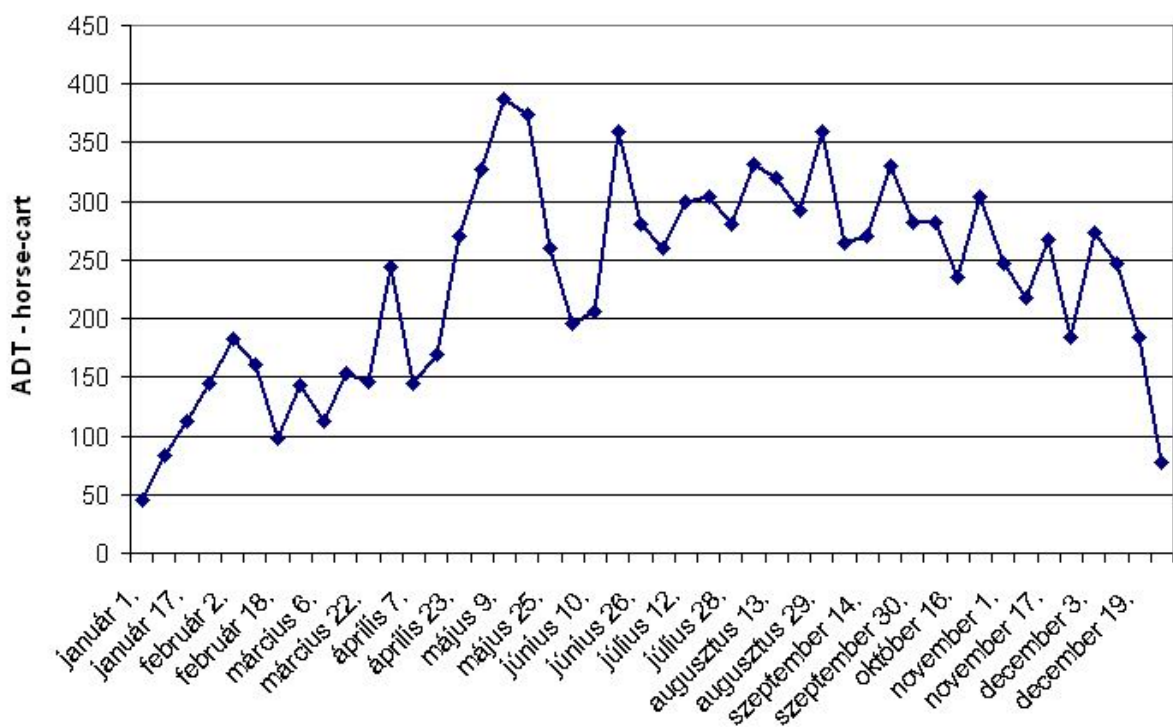


Source: [5]

The results of the traffic count on regional roads was unknown until now, but result of some regions have been found owing to the researches in the appropriate archives. As an example I show below the weekly traffic surveyed in the 39-40. km segment of the Aldoboly-Bükszád (Dobolii de Jos – Bixad, RO) county (regional) road (today National Road No. 12) in Háromszék county (today Covasna county, RO). (Figure 1)

Figure 1

The weekly traffic of the Alsódoboly-Bükszádi road (39-40. km segment) in 1894



Source of data: [6]

The average daily traffic was 481 hauling animal per day in the whole country, including the state roads with somewhat heavier traffic (on average 498 hauling animal per day) and the regional county roads with less traffic (on average 430 hauling animal per day).

The road sections with the most traffic in 1894 such as at the time of previous counts were near crossroads and in the vicinity of major cities. Outstanding traffic volume (2000 - 4000 hauling animal per day) was found in the suburbs of Budapest as in the 1870's, but in 1894 followed by some of the roads in the vicinity of Munkács (*Мукачеве*, UA), Pécs and Eperjes (*Prešov*, SK).



Examining the weekly traffic volume revealed that the road traffic had a seasonal nature. The volume of the traffic in the winter and Spring months was multiplied in the summer and autumn.

Major difference to the results of the 1870/71 census is the significant decline in the traffic volume in general by 1894. Comparing the road sections with appropriate data from 1874 and 1894 a decline of 27 per cent is noticed, meanwhile however the regional traffic differentiation smoothened.

The largest decline (approx. 30%) was observed in Eastern and Northeastern Hungary where the roads with the most traffic laid, whilst on the roads of Transdanubia and North-western Hungary, where the roads had less traffic, the decline remained under 20 per cent.

The new traffic condition is a result of numerous possible causes. Apart from the expansion of industrial production and the effect of railway traffic the regional characteristics (though hardly measurable) are to be taken account of. Though the quality of roads also affected the horse-cart traffic, the traffic of state roads has no correlation with the development of regional (county) road network.

A possible and numerically expressible explanation for the new road traffic condition is the development of railway network both in length and regional distribution. However this argument also requires further verification. From 1874 to 1894 the length of railway lines was doubled, and main lines reached the eastern borders of the country. The stagecoache services were terminated, the role of long distance traffic declined and by the end of the 19<sup>th</sup> century the main role of the road network became to connect the railway stations to the settlements without railway. Although the process caused by the railway development could not be seen in the 1870 decade within a few years period, on a longer timescale, within 20 years, significant changes occurred in the road traffic due to the railway development.

By the end of the 19<sup>th</sup> century the role of the road traffic was diminished to being a supplier and complements to the railway traffic. The high traffic volume in this period was partly a positive sign of development in the supplier function, however in regions lacking appropriate railway connection, high road traffic was the sign of under development.

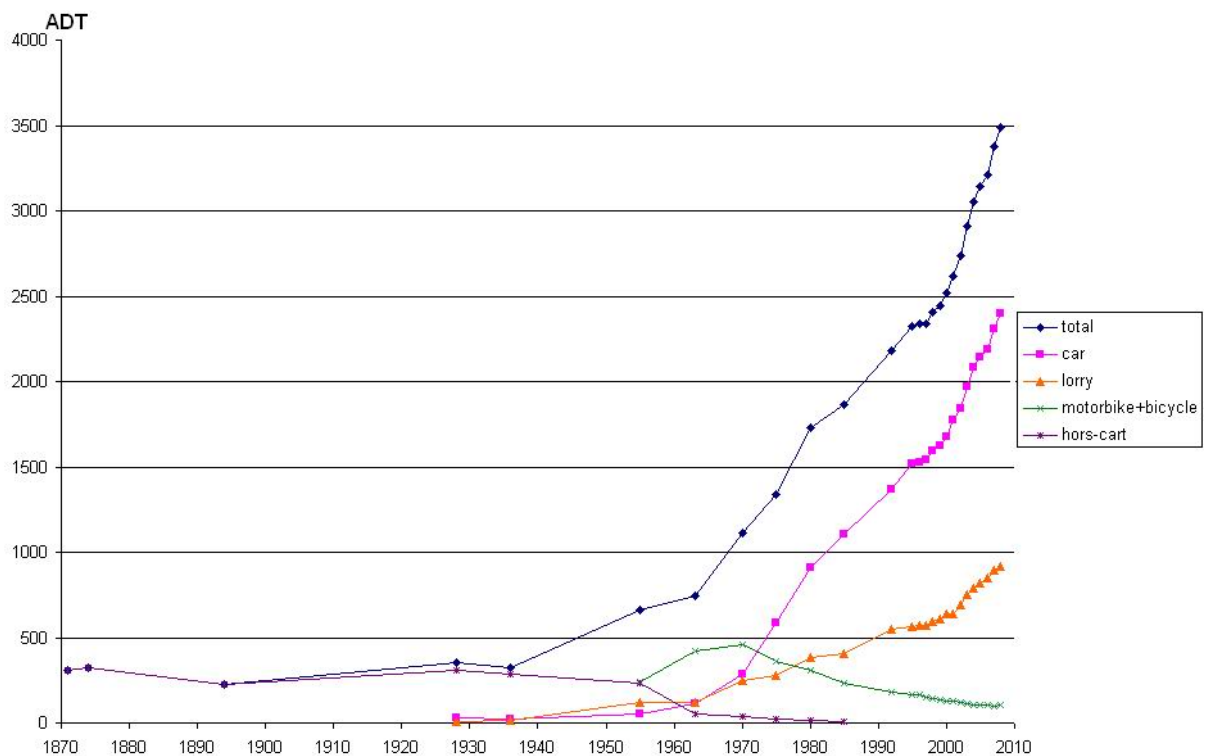
## The significance of road traffic on the modern world

The expansion of the motorized road traffic was hindered by several factors in the 20<sup>th</sup> century. First the great economic crisis in 1929-1933, later the 2<sup>nd</sup> world war and finally the state policy of the 1950's and 1960's which placed obstacles to the individual mobility.

On the national level the rate of motor vehicles was only 12% even in the mid 1930's. Only by 1960 Hungary succeeded to recover the number of personal cars that was before the great economical crisis. Horse-cart traffic remained the principal mean of road transport until 1950's. In relation to the total traffic volume of the transport networks, the road traffic became dominant by the end of 1960's in the passenger traffic and only in the 1990's in the freight transport. Figure 2 shows the role of the different means within the road transport.

Figure 2

Changes in the road traffic in Hungary between 1871-2008



Source of data: Transport Statistical Yearbooks

The meaning of high traffic volume had changed by the first half of the 20<sup>th</sup> century. The previously homogenous horse cart traffic became more complex as passenger motorcars appeared. Though the horse cart traffic of that time revealed the handicap in regional

economic development and the vagueness in the railway network, the growing passenger motorcar traffic had a different meaning. While in the Eastern part of the country hardly any motorcars were counted, their use became more general in the Budapest region, in the direction to Vienna and primarily around the Lake Balaton, which was discovered for tourism at that time. Around Lake Balaton the rate of motorcars on some roads exceeded 40-50 per cent, therefore their presence became an indicator for tourism and economic prosperity.

The 1950-s and sixties brought a new era in the motorized traffic of Hungary. As a political decision private motorcars were forbidden in the 1950's, the individual mobility was considered to be dangerous which remained a ruling ideology until the 1968 National Traffic Policy. As a result an interesting interim period came in the History of the Hungarian transport, as bicycles and motorcycles became the most numerous means of road transport for about two decades.

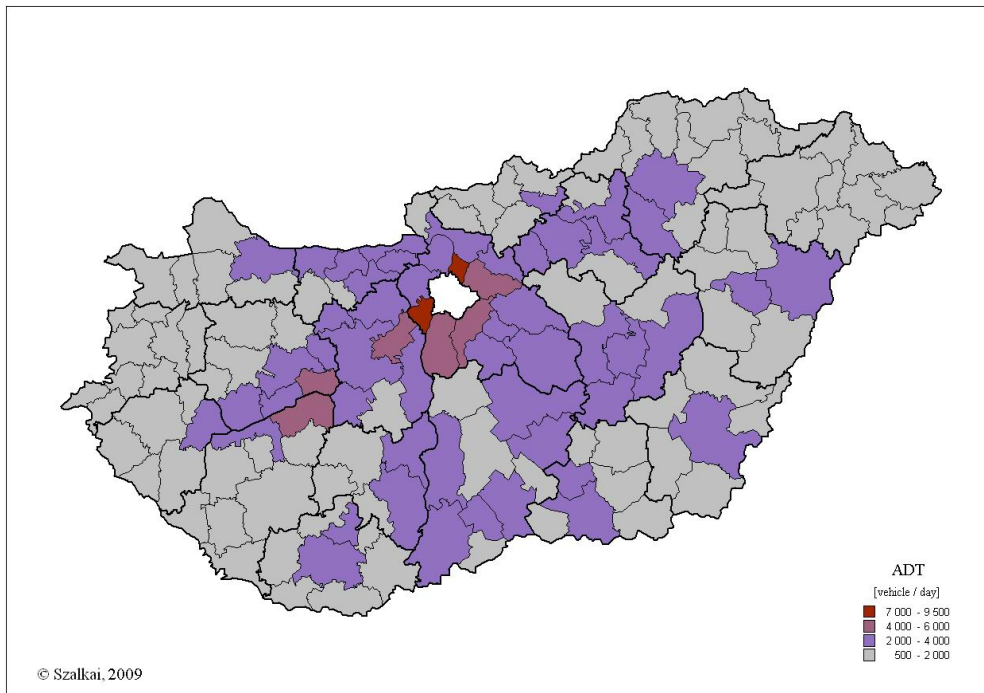
This was followed by the latest era, up to today's times, which started with the 1968 measures, aiming for political stability. In the passenger traffic the individual mobility was recognized as a personal basic right. Together with the drastic closure of railway lines these induced large increase in the road traffic.

The traffic volume have started increasing in a way that was never seen before, and apart from two small declines in the fall of communism and the mid 1990's economic crisis, it has been growing up to present. The location of the heaviest traffic in the national road network was displaced from the main urban roads to the highways, indicating a new social-economical order based on a wider regional division of labour.

On a micro-region level the analysed trends can be traced back until 1985. On these maps indicating the average traffic volumes using corresponding categories, it is clearly visible how traffic increased in size and spatial expansion. (Map No. 3, Map No. 4)

### Map No. 3

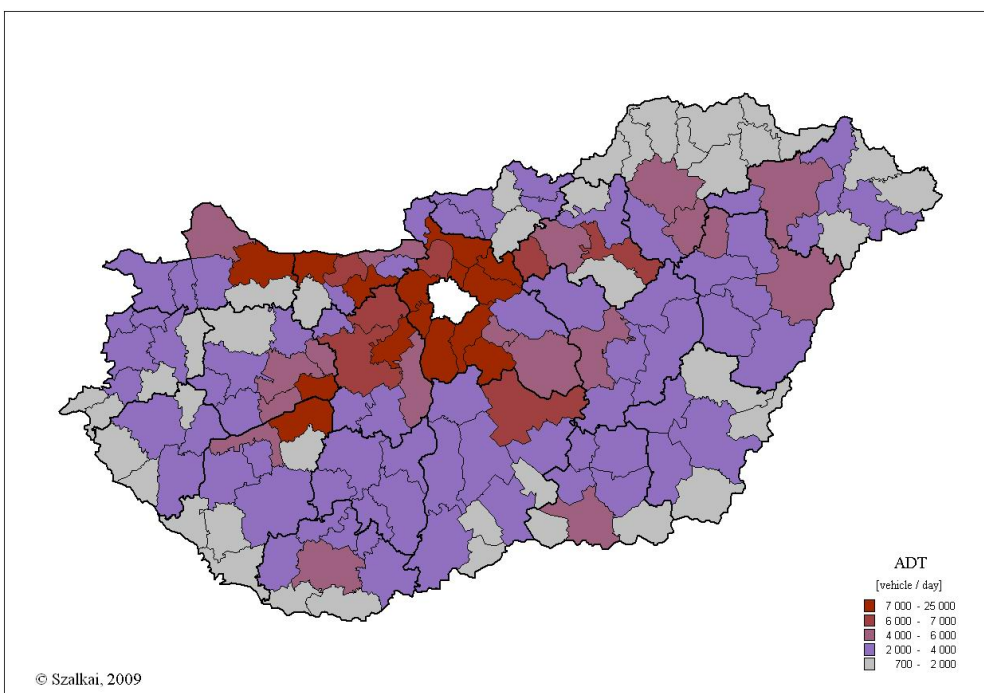
#### The size of traffic in microregions, 1985



Source of data: Department of Road Transport, Ministry of Transport

### Map No. 4

#### The size of traffic in microregions, 2006



Source of data: Hungarian Road Corp.

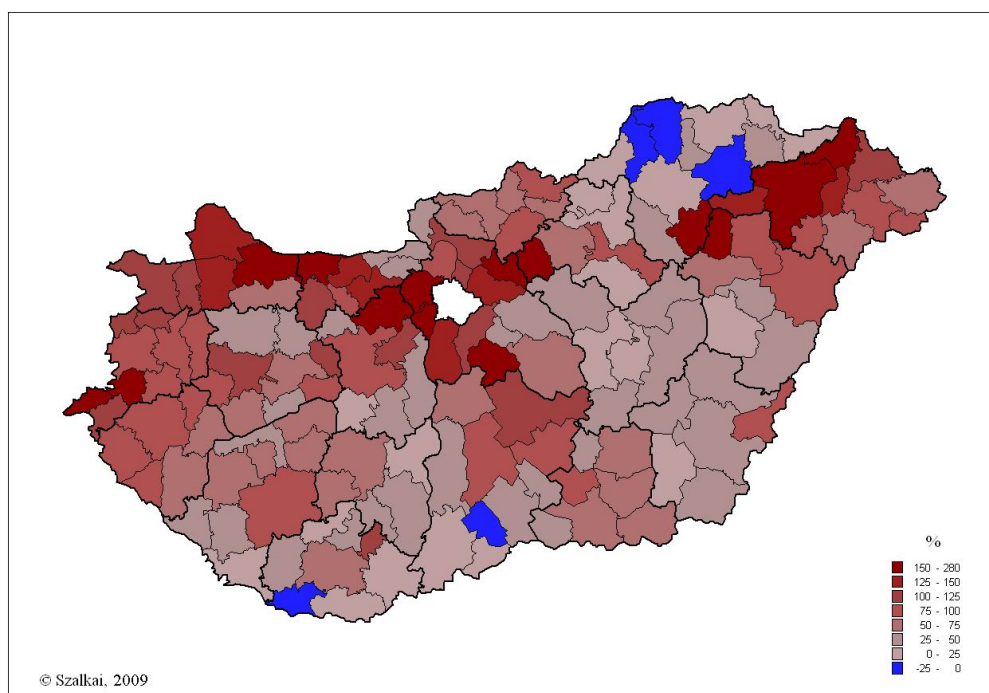
In 1985, beside the roads found in a few regions within the Budapest agglomeration, the roads in the regions of main tourism destinations (the regions of Lake Balaton and Lake Velencei) were the most loaded with traffic. These were followed by areas along highways, in the catchment areas of major cities, and some special microregions.

By 2006, the increase and decrease in the extremes as a consequence of spatial-economic processes alone indicated a growing polarisation, which was further amplified by the size of transit traffic along the main axes. The traffic along these axes plus the catchment traffic of the capital city denote the regions with the highest traffic, still complemented by the traffic in the surrounding area of Lake Balaton and the regions of several major cities. Nevertheless, this is not what is new compared to the conditions 20 years ago, but the fact that the size of the traffic in several, especially border microregions have become conspicuously lagging behind the national average. The situation is particularly “serious” along the Croatian, Slovenian, Ukrainian borders and the north-eastern section of the border with Slovakia, but traffic has stayed very low also in the central areas of North-western Transdanubia located in “traffic shade”. In the case of most of these areas, the “lack” of traffic is also an indicator of structural crisis.

Similar conclusions are only partially justified when examining the microregional trends in traffic volume in the last 20 years. (Map No. 5)

Map No. 5

The change in traffic in microregions, 1985-2006



Similarly to the regions of outstandingly high traffic, considering the increase in traffic, those microregions around the capital are the leaders (with a more than threefold growth in traffic) where the effects of suburbanisation and transit are combined.

A little behind follow the areas of corridors (the total lengths of the M1 and M5 axes) which are “only” affected by transit, while in the case of M3, only the regions along its section near Budapest have experienced a growth in traffic, and the otherwise increased traffic along the M3-3 axes does not seem to have been able to compensate for the structural crisis in the Borsod region (North-eastern Hungary).

Assumedly, the dynamic traffic growth in Western Transdanubia can be attributed to the positive structural transformations and the changed geopolitical conditions, which former shows the prosperity of this part of Transdanubia. At the same time, the also rather outstanding and special traffic dynamics in the Ukrainian border areas can be explained by the change in the geopolitical situation. For many people in this otherwise low-traffic and disadvantaged region, the only chance for survival is to engage in the cross-border black and grey economies, which together with the trade directed to Ukraine and Russia, which had shifted from railway to public roads, has caused a substantial growth in traffic.

In several other regions of the country, nevertheless, traffic growth has not occurred or has been only marginal. In five microregions, from which three are situated in North-eastern Hungary, traffic has not only stagnated but declined in the last 20 years. The most significant, an almost 25% decrease has affected the microregion of Sellye along the Croatian border. An assessment by motor vehicle types pointed out also that this is the only microregion where the traffic of passenger cars has also dropped, while in North-eastern Hungary the decrease of overall traffic could be attributed to the decline in freight traffic

The compilation of the microregional data series was a prerequisite for further investigations: the analyses of relationships between traffic and other, social-economic indicators.

### **The size of traffic in the view of different social-economic indicators**

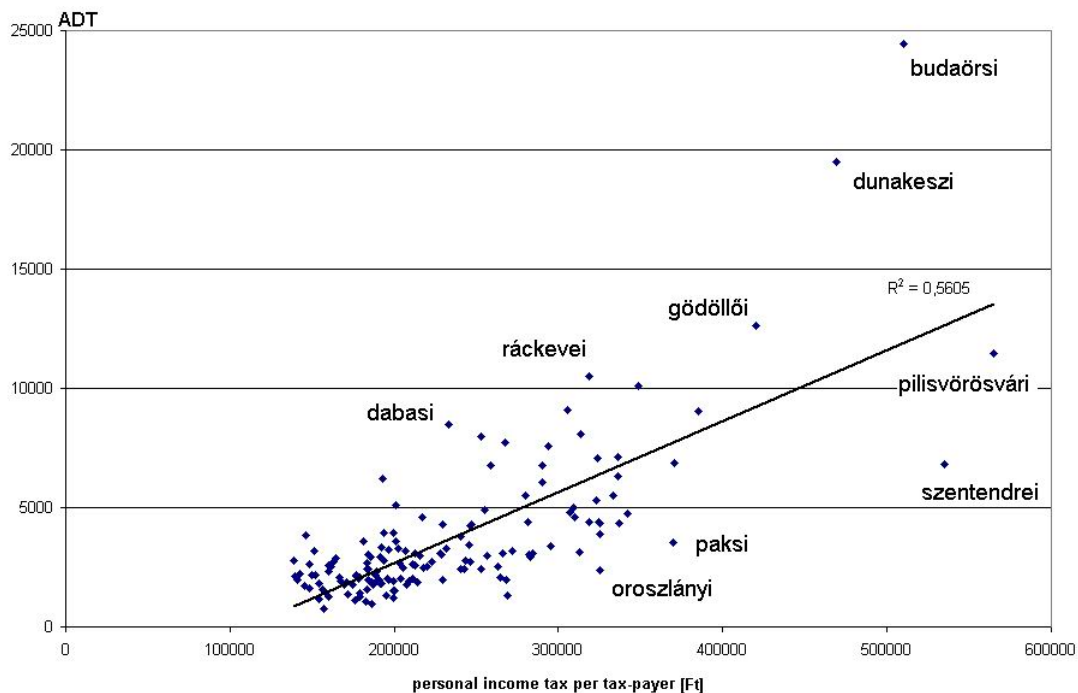
In my analyses, I assessed traffic data in the view of social, economic and environmental indicators; the assessment of the – otherwise obviously existing – relationship with health related indicators was hindered by the multifactor nature of pulmonary diseases.

### *Relationship between traffic and personal income tax*

From among the indicators studied, the correspondence between the inhabitants' income level and the size of traffic offered the possibility for the most detailed analysis. Based on the traffic data generated on the microregional level and the personal income tax data from the database of APEH SZTADI (the Hungarian Tax Authority), aggregated also on the KSH150 scale (i.e. statistical division of Hungary into 150 microregions), it was possible to review the processes from the last approximately 20 years. Nevertheless, first I examined the relationships between the microregional data series from 2006. (Figure 3)

Figure 3

The relationship between personal income tax and public road traffic on the level of microregions, 2006



Source of data: KSH T-STAR (Central Statistical Office), APEH-SZTADI (Hungarian Tax Authority)

Personal income tax per tax-payer is in a rather tight correlation ( $R^2=0.56$ ) with the size of public road traffic, which can be attributed to motor vehicle ownership and regular car usage, both depending on the income level of the inhabitants. Consequently, personal income tax – together with motor vehicle ownership – is in the closest relationship with the size of passenger car traffic from among the traffic volumes of different major vehicle-categories.

The majority of the microregions which deviate most from the trend marked by the regression line are located in the vicinity of the capital; however, they can be divided into many groups according to their geographical proximity. This grouping is based on the locations in both the income space and the network space, since the traffic size predicted from the income is fundamentally modified by the agglomeration traffic of Budapest as well as the transit location. The five microregions near the capital, with the highest specific income levels are especially interesting in this regard. In the case of three of them, i.e. the microregions of Budaörs, Dunakeszi and Gödöllő, the (otherwise outstanding) income levels are not sufficient alone to explain the high levels of traffic: it is due to the huge agglomeration and transit traffic. In contrast, the microregion of Szentendre, which is nationally the second “richest”, is in a distinct position: as a result of the Danube and the surrounding topography it was (before the opening of the northern section of the M0 ring) so much in a “traffic shade” that there was only a single secondary road reaching to it from the network of main roads. Meanwhile, it is difficult to find the explanation for the relatively “low” (although nationally, the fourth highest) traffic in the microregion of Pilisvörösvár, which is crossed by three high-traffic roads. Its position below the regression line can be attributed most probably to the relatively extensive area of this microregion and its richness in by-pass roads.

Microregions south of the capital city, with somewhat lower status, lower income levels and further location constitute a separate group featured by relatively high traffic volumes due to transit (the microregions of Dabas and Ráckeve).

From among the microregions significantly divergent from the trend, the last group is the only one that contains microregions that are not situated close to the capital. Next to the Paks microregion, which is well-known from spatial analyses for its outstanding position in the income space (the only nuclear power plant of Hungary is found here), we do not find this time the high-traffic Tiszaújváros (petrochemical industry), but another significant industrial-mining microregion, that of Oroszlány. This is for the reason that in these regions, the high income associated with energy producing industries is not coupled with greater traffic loads, even despite the fact that the microregion of Paks – unlike the microregion of Oroszlány – is not located in a “traffic shade.”

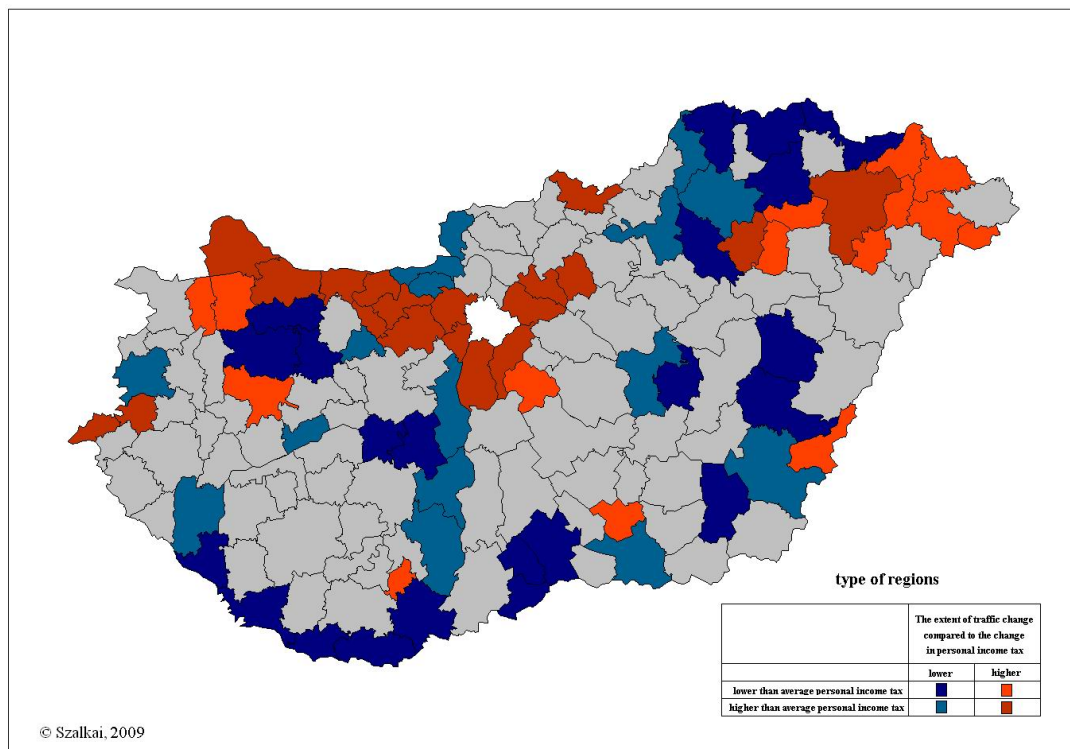
The strong correlation with personal income tax allowed for the assumption that the changes in income may be also in a long-term correspondence with traffic increase. To find evidence for this, I compared the change between the earliest income tax data from 1988 and that of 2006 with the change between the traffic data of 1985 and 2006 on the microregional level. The regression analysis however, did not confirm the assumed correlation for the 20



years long period ( $R^2=0.18$ ), which means that the change in traffic volumes over a longer period of time has more complex causes than the change in income levels. Nevertheless, the connection between traffic and personal income tax levels is observable currently and – as confirmed by calculations – existed also in the late 80s, which suggests that the trend must be valid nationally; this trend however, is significantly weakened by certain microregions that develop in particular, individual ways. This supposition is justified by the special spatial structure indicated by the sizes of residua. (Map No. 6)

### Map No. 6

Regional typology determined by the residua in view of the per capita personal income tax in 2006



Besides the microregions indicated in grey colour, which behave normally in terms of the income – traffic change relationship, I have distinguished four special groups. In microregions indicated with a red shade, the traffic change was greater than predictable based on the change in income, while in those indicated in blue, the traffic change was smaller than expected based on income change. These two groups were further divided according to whether the microregion had a higher or lower personal income tax per tax-payer than the national average in 2006.

The four categories thus formed provide a good overview of the microregions that are in some special situation as well as of the reasons for their speciality. The greater increase in traffic in the case of the areas marked with red can be explained by three, spatially distinct reasons. The expansion of traffic to the west (Austria) and to the east (Ukraine) signifies the return “to the trend” after the earlier administrative bans were uplifted, as well as the intensified economic (and to the west, tourism) relations. While – especially in the case of the former Soviet Union – the increase coming from legal economic relations and the shift of traffic to public roads plays a role in both directions, the growth in eastern local border traffic is the outcome of the compelled engagement in the informal (grey and black) economy. Besides these border regions, certain, economically dynamic microregions along highway axes (M1 and M3) also belong to this category, from which many are also part of the suburban zone of the capital, which has generated an excess of traffic around Budapest since the 80s.

Regions around the capital and along M1 with a significant increase of traffic also have higher-than-average income levels, while in the eastern part of the country, only the microregions of three major cities belong to this category. On the other hand, areas with lower-than-average income levels are located east of the Danube with only four exceptions, which implies, besides the unreported incomes, that external reasons play a dominant role in the increase of traffic in these regions.

Most of the regions with low traffic (or decreasing traffic) marked with blue are to be found in a spatially compact way; these are situated in known external and internal peripheries. Such (and according to the personal income tax data from 2006, poorer than average) microregions are situated along the Croatian border with a considerable Roma population, as well as in North-eastern Hungary, which reflects the peripheral situation in terms of traffic besides the economic difficulties. This group includes also the internal periphery south of Győr, known also from the spatial pattern of motor vehicle ownership and accessibility studies (Szalkai, 2006), as well as some microregions in the Great Plain.

Almost the whole length of the left bank of the Danube south of Budapest, the corner of Danube and Ipoly, as well as the microregions of several major cities east of the Danube (Szeged, Békéscsaba, Szolnok, Miskolc, Eger, Kazincbarcika) are “depressed” only in terms of traffic volumes, while their economies are dynamically developing. Considering the entirety of the economic-environmental system, these regions can be regarded as the winners in Hungary, since their higher-than-average economic levels go together with only a smaller increase in traffic volumes.

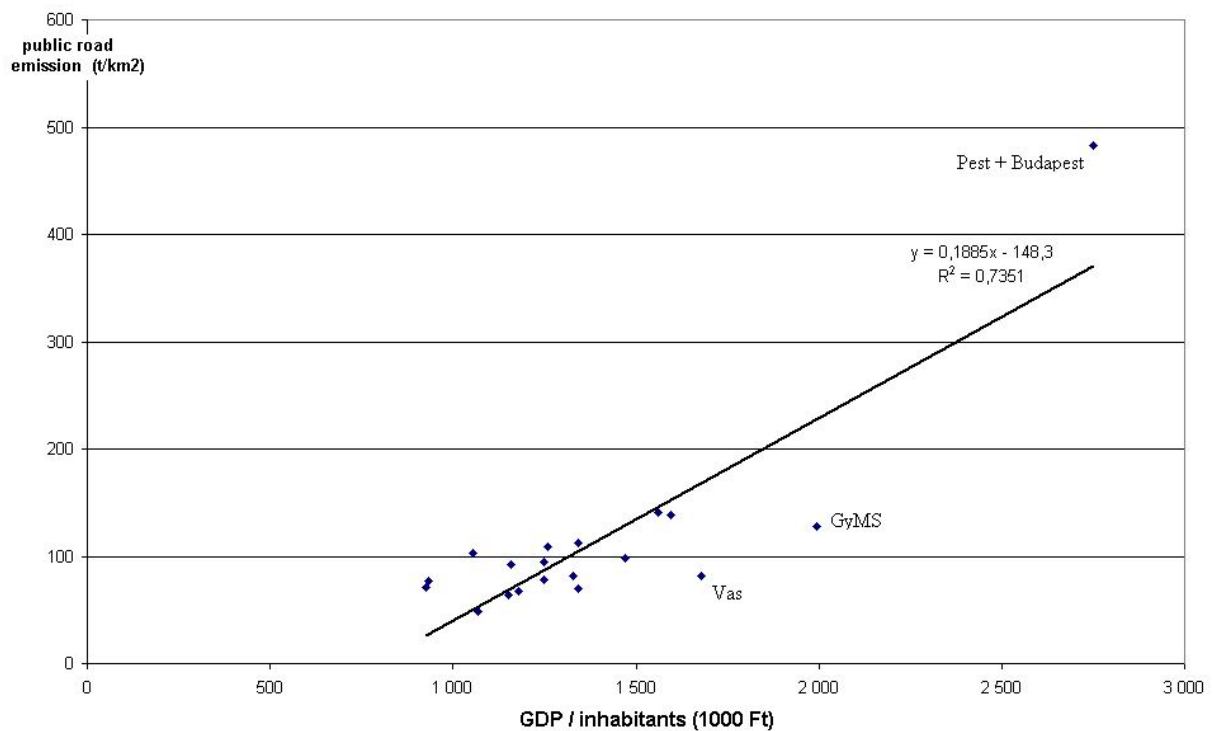
### *The relationship between economic development and air pollution on public roads*

With reference to transport, and especially public road transport, it is of utmost importance to understand the environmental impacts of the sub-sector. Transport is the sector contributing the most to NO<sub>x</sub> and CO emissions (62% and 73.5% respectively), but in Budapest, more than 90% of all CO emission comes from motor vehicles.

The assessment of the emission data becomes particularly interesting when compared to the level of economic development. The correlation coefficient of a medium strength that is calculated from the data of counties outside the capital ( $r = 0.49$ ) rises to 0.89 after including Budapest as well. (Figure 4)

Figure 4

The relationship between public road emission and GDP on the level of counties, 2002



Source of data: Merétei et al (2002)

The dispersion diagram shows a major divergence in the cases of three counties. While in the case of Pest County and Budapest, the difference is positive, i.e. the level of air pollution is higher than would be expected from their levels of economic development, in the two

westernmost counties emissions stay below the level that would be expected based on their economic position.

The diagram reveals the unfortunate trend that economic development is least possible without polluting the surrounding environment.

## **Summary**

After having tested it along a series of other variables besides the ones discussed above, it can be established that mostly, public road traffic is dependent on different factors by different vehicle categories. While the income tax and number of motor vehicles – indicating social welfare – are in a closer relationship with the number of passenger cars, the GDP per capita – indicating economic performance – “influences” more the traffic of freight vehicles. Within this category, the closeness of the connection improves further when excluding small trucks (those weighing less than 3.5 tons) from the calculations, which are the least relevant to industrial production. We see the same when we analyse traffic compared with the per capita value of industrial production, or when relating it to unemployment rate with a negative sign, to mention but a few options.

These results suggest that economic development is more suitably described by smaller scale freight vehicle traffic which follows the rational decisions of the economy better, than by total traffic or passenger car traffic, because the transport of persons depends on several social, meteorological, psychological factors, too, which cannot be easily analysed quantitatively.

From the perspective of the entire society, the final conclusion is that although, based on the above, the size of traffic, in contradiction to the 19<sup>th</sup> century, can be in itself regarded a “development indicator”, a more polluted environment caused by public road traffic is also a part of the assessment of prosperity, which on the long run will mean so big a contradiction that it may endanger the current social system.

## Bibliography

- [1] NAGY, Iván (ed.) (1872): *Report of the House of Commons called on 20th/04/1869 (Az 1869-ik évi április 20-dikán kihirdetett Országgyűlés Képviselőházának Naplója)*; Vol XIX.; 404th sitting on 14th/12/1871, Speech of Károly Antalfi, Published by Légrády testvérek, Pest, 194. p.
- [2] Bill of Roads No. 632. In: *Documents of the House of Commons called on 28th/08/1875* Vol.: XIX (Az 1875. évi augusztus hó 28-ra hirdetett Országgyűlés képviselőházi irományai), Schlesinger és Wohlauser, Budapest, 1877
- [3] MOL K173 1871–64–11–10242
- [4] MOL K173 1886–11–6935
- [5] *Traffic Map of State Roads in Hungary edited on the basis of the 1894 census (A magyar állam területén lévő állami közutak forgalmi térképe az 1894. évi forgalmi adatok alapján szerkesztve)*; Royal Hungarian Ministry of Commerce (Kereskedelemügyi Magyar Királyi Minisztérium), 1895
- [6] DJAN Covasna, Fond 9, Documents of Háromszék county, 12492/1893
- [7] Szalkai, Gábor (2006): Elérhetőségi és forgalmi változások az elmúlt évek gyorsforgalmi úthálózat fejlesztéseinek következtében, (*Changes in accessibility and traffic due to development in the motorway and expressway network in the recent years*), Közúti és Mélyépítési Szemle, 2006/11-12, pp. 18-24.
- [8] Merétei, Tamás – Antal, István – Antoni Zsolt (2002): A hazai közúti, vasúti, légi és vízi közlekedés országos, regionális és lokális emisszió-kataszterének meghatározása a 2000-es évre vonatkozóan (Translation: *The Definition of the National, Regional and Local Emission-Cadastre of the Hungarian Road, Railway, Air and River Transport.*)