

## **Influence of Transport on Urban and Rural Development in Bosnia and Herzegovina**

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### **1 ABSTRACT**

In this paper a possible influence of transport on urban and rural development in Bosnia and Herzegovina is being discussed. In Bosnia and Herzegovina, like in other former socialist countries of Europe, urban and rural development had a different importance in the past fifty years. Influence of transport on the future orientation of transport network and traffic courses in Bosnia and Herzegovina and on its geographic-traffic position is being evaluated. Overall economic development of Bosnia and Herzegovina in the past ten years has been marked by several important events, which reflected intensely in its transport as well as regional development. Inheritance that the country of Bosnia and Herzegovina bears from the former country will be a stumbling block for many years in its future rural and traffic development. This is the most evident in the area of orientation of transport network and business relations, as well as in instruments by which economic position of transport is regulated.

Construction of new and extension and reconstruction of the existing roads in Bosnia and Herzegovina is an assumption that rural development of economy and population will be strongly affected by transport. It is also important to emphasize that the future economic growth of industrial production and the population growth, as well as development of demand for transport services will have a permanent growth by means of the future more developed transport. A bigger use of Bosnian transit routes by other countries will also have an influence on rural development considering the fact that international transport has been growing more rapidly in the world than local transport in the past decade. Transport system has a big importance in economic and social development of Bosnia and Herzegovina. First of all, it enables availability of all areas thus affecting the rural development.

### **2 INTRODUCTION**

In this paper, a possible classification of roads and influence of transport on urban and rural development in Bosnia and Herzegovina is discussed. Influence of transport on the future orientation of road network and traffic flows in Bosnia and Herzegovina and on its geographic-traffic position is evaluated. Construction of new, expansion and reconstruction of existing roads in urban and rural settlements of Bosnia and Herzegovina are also discussed. Transport will contribute to a faster regional development of economic activities and population in rural settlements. It is also important to emphasize that the future economic growth of domestic industrial production and population growth, as well as development of demand for transport services, will have a permanent growth with the future development of road network. Influence on development of road network will have also an increased use of Bosnian major highways from other countries, considering the fact that international transport has been growing faster in the world in the past decade than domestic one. On such concept of transport network, a new economic development in urban and rural settlements of Bosnia and Herzegovina should be based (Malić, (1998: 89-96).

This is most evident in the field of directiveness of transport network and business relations, as well as in instruments by which the economic position of transport was regulated. Road transport has had an increasingly important role lately in the system of communications between urban and rural settlements in Bosnia and Herzegovina, which gives a new image of regional development in the space. With inclusion into development flows of the European Union, a possibility for a faster economic development is being opened, particularly through valorization of some comparative advantages of Bosnia and Herzegovina. For example, we are highlighting the possibilities of modern economic development in urban and rural settlements that are offered by traffic-geographic position of Bosnia and Herzegovina, (Nurković, R.2007: 7-19).

### **3 TRAFFIC NETWORK IN BOSNIA AND HERZEGOVINA**

Generally observed, and within the limits of the European Union, traffic network in Bosnia and Herzegovina is underdeveloped. In 2010, lines of communication constructed from 1945 to 1991 were mainly used.

Network of regional and local roads have been increasing from year to year, however, the quality of asphalt layer and the increased motorisation affected its fast ruination. Total length of traffic arteries was 21.846 km, of which 11.425 km were highways, and 10.421 km were the other roads (Fig. 1). Railway lines were insufficient as well. Total length of railways in Bosnia and Herzegovina at the end of 2010 was 1.000 km. (www.bosnaihercegovina.biz).

In the same period, construction of the A1 Motorway, which is part of the Pan-European Corridor Vc was planned. The motorway will be built by extending the M5 motorway, up to the M17 motorway, wherefrom the motorway will go in a different direction. The A1 Motorway will pass through the following settlements (north-south direction): border of Bosnia and Herzegovina with Republic of Croatia, Donji Svilaj-Modriča-Doboj-Zenica-Kakanj-Visoko-Jošanica-Sarajevo-Jablanica-Mostar-Border with Croatia, Gabela. The A2 motorway is also planned and is going to pass through the following places (southeast-nortwest direction): border with Serbia, Hum-Foča-Goražde-Sarajevo- Zenica-Travnik-Jajce-Ključ-Bosanski Petrovac-Bihać-Border of Bosnia and Herzegovina with Croatia, Izačić. Parralel to the mentioned corridor, construction of the Vc Railway corridor has also been planned, which will with a larger section follow the motorway direction on the corridor. It will be an important connection with Hungary (rest of Europe), Croatia and Bosnia and Herzegovina. It will connect Bosnia and Herzegovina with Croatia at port of Ploče, which is very important, not only for Bosnia and Herzegovina, but also for Croatia.



Fig. 1: Traffic network in Bosnia and Herzegovina. Autors: Drešković, N., Nurković, R. (2014.)

Road transportation of Bosnia and Herzegovina is differentiated as it is in other neighbouring countries. There are differences between the branches recovering faster from the war damages and those that still do not serve their purpose. Despite the difficulties and a poor, inherited structure, road transportation has largely started to expand, while the railway transport is still without the expansion and is carried out with a few capacities. In the period from 1992 to 1995, road and railway network were destroyed around 35%, and the bridges around 40%. By time, most of the road and railway transport on main lines has been renewed. According to 2003 data, there were about 22.400 km of roads of which 75 km were motorways. Main roads

are Bosanski Šamac-Doboj-Sarajevo–Mostar- Metković; Gradiška-Banja Luka–Jajce–Bugojno-Jablanica and Donji Vakuf-Jajce-Travnik-Sarajevo. Regarding the railway transport Bosnia and Herzegovina has 1.031 km of railway lines, of which 795 km are electrified. By mid 2003, Bosnia and Herzegovina was the only country of Southeast Europe that did not have a single kilometer of modern motorway, and by 2007, about 45 kilometers of motorway were built. Today, lines of communication in Bosnia and Herzegovina, including the capital Sarajevo, are among the worse roads in Europe. They are obsolete, poorly maintained and dilapidated, as the experts of the European Union, who thoroughly analysed them in 2005, claim. (Table 1 and Chart 1).

Category	L (km)	L( %)
Major asphalt	3149,88	25,87
Regional	820,65	6,74
Local asphalt	3676,94	30,20
Major macadam	237,30	1,95
Local macadam	4288,79	35,23
Total	12173,56	35,23

Table 1: Length of road communications in Bosnia and Herzegovina. Source: The Agency for Statistics of Bosnia and Herzegovina, 2014

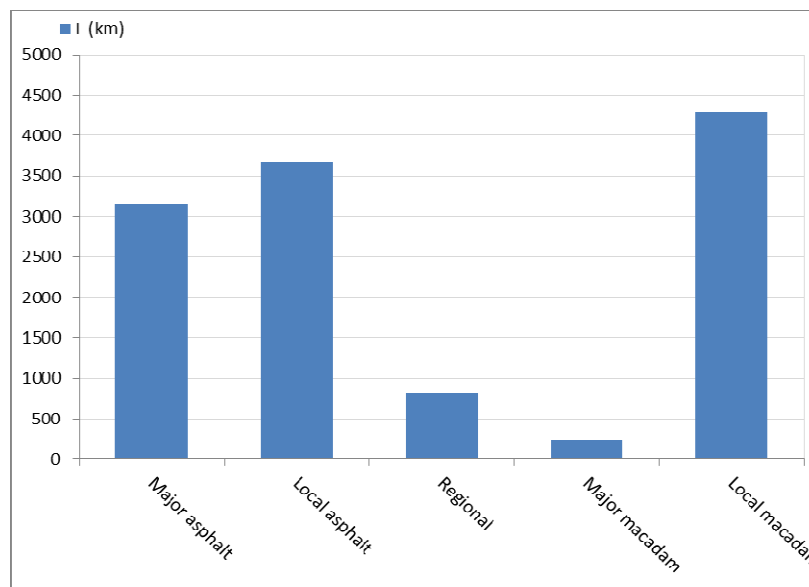


Chart 1: Length of road communications in Bosnia and Herzegovina.

While analyzing the length of road communications by regions in Bosnia and Herzegovina, a disproportion is noticeable, which additionally highlights the differences in economic development as well. The region of Tuzla has the densest road network (about 40 km/100 km<sup>2</sup>) while the poorest region regarding road communications is the region of Banja Luka with about 25 km/100 km<sup>2</sup>. Regarding the length of road communications the region of Sarajevo takes the first place and is followed by Mostar, Banja Luka, Tuzla, etc. Since 1992, economic structure has undergone significant changes in city of Sarajevo. The fundamental characteristic of these changes is a reduction in volume of production or a complete closing down the large economic systems. Industrial lines are mostly neglected and are insufficiently used. In addition, they still represent a strong traffic infrastructure that may be used for other purposes, as required by contemporary economic development, such as establishment and construction of industrial and duty-free zones, freight terminals and large shopping centres. In the following period, railway transport will have a big importance in development of intermodal intersection of Sarajevo, and also in development of traffic in the area of Canton of Sarajevo, respectively of metropolitan area of the city. In 2010, the highest speed of passenger trains in Bosnia and Herzegovina was 70 km/h, while for freight trains it was 60 km/h.

#### 4 TRAFFIC CONNECTIONS IN URBAN AND RURAL SETTLEMENTS OF BOSNIA AND HERZEGOVINA

Traffic connections caused a radial expansion of socio-economic transformation process of urban settlements affected by travelling possibilities (Šimunović, I. (2007: 112-126). Migrations to suburban settlements may go from rural settlements of the surroundings or other areas, but also from the home city. When urban population share is analysed in total number of population of Bosnia and Herzegovina, it is concluded that it is a poorly urbanised country. It belongs to a group of the European countries with the lowest share of urban population, which does not exceed 50% of total national population. At the end of the 20th century, Bosnia and Herzegovina was in industrial phase of development, at which active population share in secondary activities was dominant and still increasing, but the active population share in other activities was also high. So, the share of active population in primary activities, of more than 30%, is still high. In this direction, a dominance of the number and the share of rural population over the urban population should be observed. For rural development in Bosnia and Herzegovina, traffic has a big importance. Considering its poorer arrangement in rural areas, the transport of goods and services is carried out with difficulties in most of rural areas. The improved traffic network brings closer rural settlements to a main source of politics, economy and society in Bosnia and Herzegovina (Dammers, E. i Keiner, M. 2006:12-13).

One of the main factors that affect urban sprawl of urban settlements in Bosnia and Herzegovina is the traffic. Sarajevo is a centre of road traffic in Bosnia and Herzegovina. Seven main roads connect the city with other parts of the country: M-5 motorway in the north, in direction of Travnik, Banja Luka and Bihać, M-17 toward Zenica and Doboj and M-18 toward Tuzla, M-5 in the east toward Višegrad and Goražde, M-19 toward Zvornik. M-18 goes southward through Foča to Dubrovnik, and M-17 westward to Mostar. The planned European motorway, Corridor Vc, will pass near Sarajevo connecting it to Budapest in the north, and Ploče in the south. So, the model consists of the central place, regional gathering places, main lines of communication connecting the gathering places and the main centre, as well as the lines of communication connecting the places of living and gathering places. (Nurković, R. 2007: 24)

Thus, town municipalities with population density of over 90 km/100 km<sup>2</sup> distinguish themselves, unlike the peripheral municipalities. Density of categorised network of the Sarajevo Canton is 68.4 km/100 km<sup>2</sup> that is substantially higher compared to the average of Bosnia and Herzegovina, which is 40.8 km/100 km<sup>2</sup>. Density of road network of the Canton of Sarajevo is higher than the density in the Tuzla Canton, which is 52.7 km/km<sup>2</sup>, the Central Bosnia Canton with 42,3 km/km<sup>2</sup> and the Una-Sana Canton with 28.9 km/km<sup>2</sup>. Road network length in the Sarajevo Canton is also bigger than all road networks of other regions in Bosnia and Herzegovina. In 2005, total length of all roads was 2.941.77 km. The peripheral municipality of Ilijaš has the longest road network of 568.22 km inside the region, while the central municipalities of Stari Grad and Novo Sarajevo are left behind. (Nurković, R. 2007:24) (Table 2 and Fig. 2)

Community	Major asphalt	Regional	Local asphalt / Canton	Lokal community	Major asphalt	Total
Centar	7,34	0	44,71	26,7	88,7	167,45
Hadžići	25,99	18,68	33,64	58,44	388,94	525,69
Iliđža	14,59	15,62	43,59	62,45	297,01	433,26
Ilijaš	33,77	12,07	18,36	44,34	459,68	568,22
Novi Grad	12,26	0	54,88	26,03	200,75	293,92
Novo Sarajevo	8,73	0,64	29,71	13,48	54,5	107,06
Stari Grad	4,53	7,88	32,23	10,48	147,48	202,60
Trnovo	5,81	25,79	52,26	59,08	281,31	424,25
Vogošća	23,88	2,42	7,01	35,52	150,49	219,32
Total	136,9	83,10	316,39	336,52	2.068,86	2.941,77

Table 2: Length of road communications in Kanton Sarajevo in km, 2007. Source: Study of traffic Canton Sarajevo, Sarajevo, 2007.



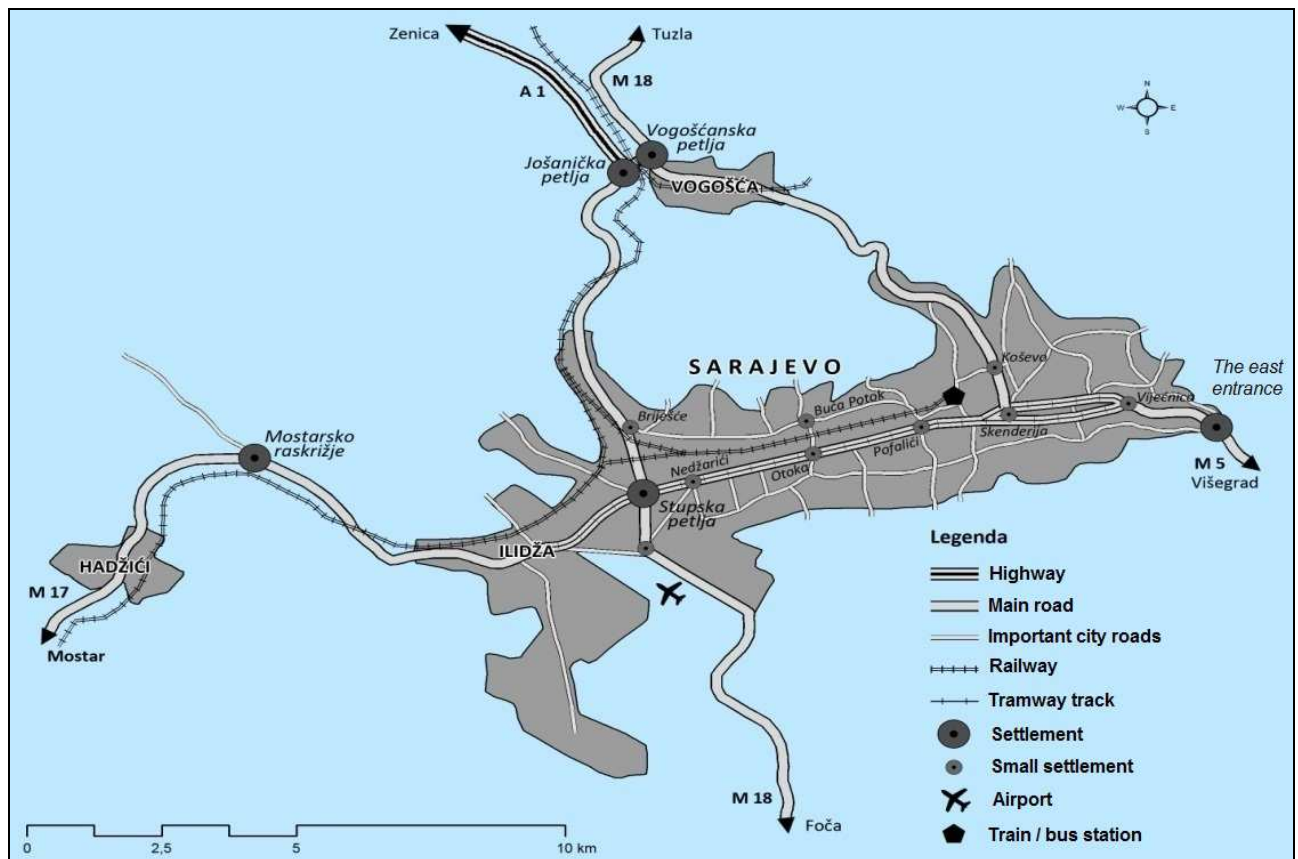


Fig 2: Traffic network in city Sarajeva, 2010. Source: Nurković, R. And Dešković, N. (2010). Study of traffic Canton Sarajevo, Sarajevo,2007.

Rural areas of Bosnia and Herzegovina, which are difficult to access, are facing serious problems in relation to a poor socio-economic sustainability and population density. With regard to several important trends in agriculture and rural areas in Europe, along with some relevant challenges and prospects for future, it is a common phenomenon that the role of agriculture in rural areas is drastically falling. Certain rural areas in Bosnia and Herzegovina have very bad traffic accessibility and are subject to decrease in numbers of the older population and rural population, in general ( Bryceson & Howe, 1992:14).

Development of traffic system enables an increased mobility of rural population, not only inside the rural area, but also in direction of urban area. Process of daily migrations in Bosnia and Herzegovina from rural areas toward work places in urban environments, requires good road connections and a developed network of bus lines of suburban transport. With analyzing the role of transport in rural development of Bosnia and Herzegovina, it is clear that except for the passenger traffic, with a permanent increase in physical volume of production, cargo traffic has also increased in Bosnia and Herzegovina. The intensive increase in number of jobs in industry affected the decrease in total number of rural population and the increase in number of employed people in traffic, thereby affecting the increase of share in total GDP of Bosnia and Herzegovina. (The Agency for Statistics of Bosnia and Herzegovina, 2013).

At the end of the 20th and at the beginning of the 21 century, traffic development in Bosnia and Herzegovina has increasingly enabled, not only functioning of basic activities, but also the development of rural tourism, respectively using free time of urban inhabitants. For planners, the urbanization result, i.e.the fact that the biggest growth had the settlements of size between 2.000 to 10.000 inhabitants, and that the biggest demographic growth realised the settlements in the group between 50.000 and 100.000 inhabitants, were particularly significant. On the Map 2, spatial arrangement of settlements having more than 2.000 inhabitants, respectively 10.000 inhabitants, with a new road infrastructure and directions of concentration of population and activities, are seen. A very rapid urbanisation development in Bosnia and Herzegovina in a relatively short period, in relation to the European standards, caused that urbanisation has demographic features, respectively quantitative characteristics, to a great extent. Certain sociological researches indicate that in such rapid quantitative changes of city sizes, one should seek also a considerable inflexibility of immigrated population to urban conditions, intolerance and aggressivity (Sabandar, 2007: 201-209).

If Bosnia and Herzegovina is observed as a whole, it can be noticed that a network of urban centers is made of, except Sarajevo as the state centre, regional centres among which according to development of functions of cities, tradition, urbanity and size of gravitation-functional area are distinguished: Mostar, Banja Luka, Tuzla, Zenica, Doboј and Bihać. In addition to these centres, there is around ten subregional centres, which are within the framework of functional-gravitation areas the bearers of development of single functions of higher rank. Urban areas of Bosnia and Herzegovina will be integrated into the urban network of Europe (Euro-regions) through regional cooperation, by forming the network of urban centres and with development of multimodal transport corridors (Nurković and Drešković, N., 2013).

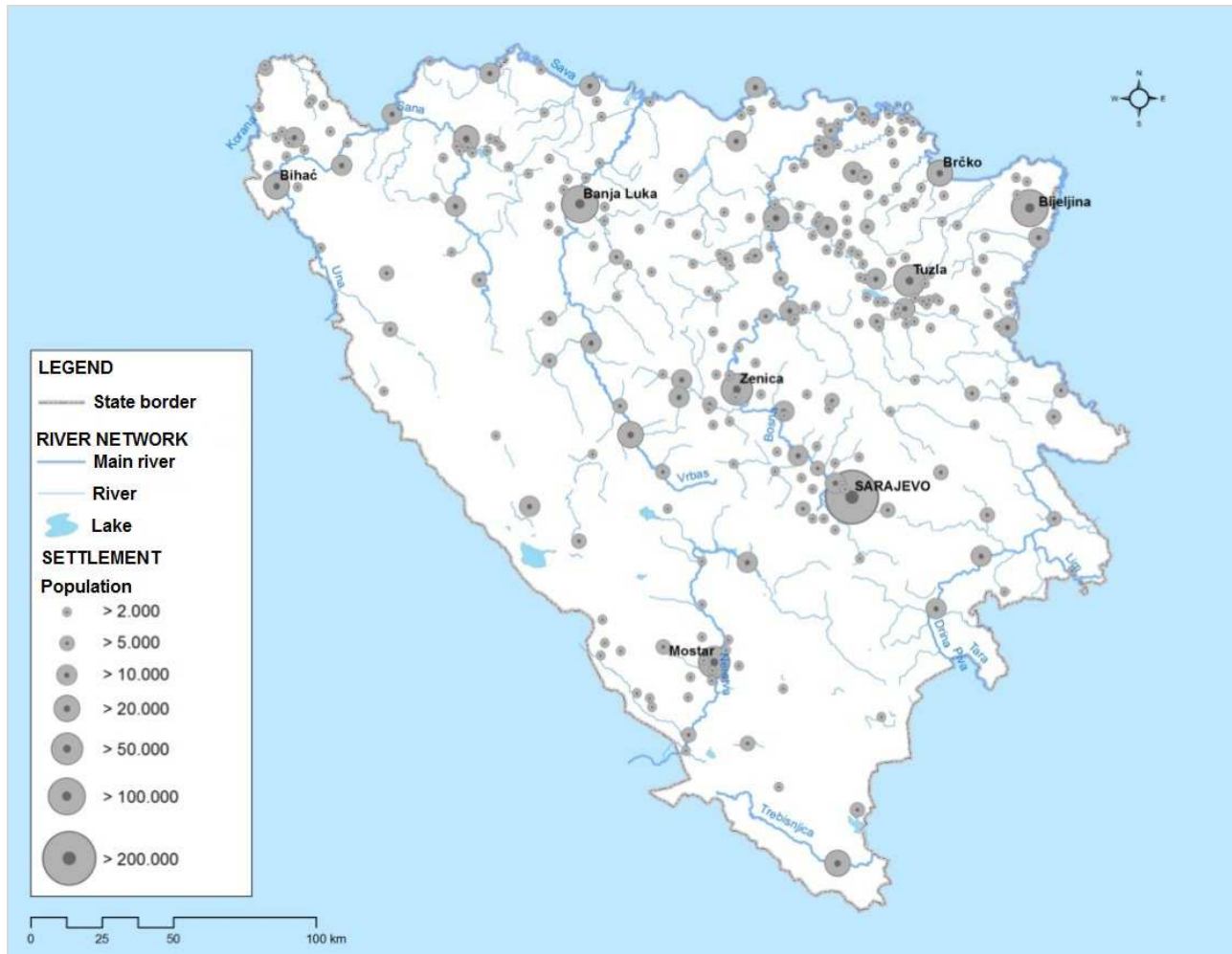


Fig. 3: Spatial arrangement of settlements in Bosnia and Herzegovina bigger than 2.000 inhabitants, 1991-2010. Authors: Drešković, N., Nurković, R. (2014.)

## 5 CONCLUSION

Bosnia and Herzegovina on its way of transition and inclusion into the European and world's integrations, among other must rehabilitate its road network as soon as possible, not only inside the larger urban settlements but also between the rural settlements and the neighbouring countries. Unfortunately, unfavourable political circumstances and a complete division of the area of Bosnia and Herzegovina considerably deteriorates the processes that are in progress, and by which the efforts are made toward a fast inclusion of the state into contemporary European and world's economic flows. The obsolete and war-damaged traffic network does not give enough hope that a new regional development of Bosnia and Herzegovina will soon get nearer, not only to surrounding countries, but also to member countries of the European Union. The huge domestic administrative apparatus and insufficient entry of foreign capital into Bosnia and Herzegovina is an additional problem that needs to be solved as soon as possible as the European Unions expands faster than expected. Old road and other communications leading through Bosnia and Herzegovina will be avoided by both those coming from the East and the West. Our neighbours will certainly know how to use it, and the European Union is going to be our first neighbour, but with the door

closed, until the state improves in accordance with the European principles, and economic and other standards.

Changes in transport are mainly imposed, so they are rather exogenous than endogenous, taking into consideration the role of two modern countries during their development. Regional transport system has been introduced without consideration of its potential synergy with local transport system. Rural population enjoys bigger economic possibilities, but the life gets more complex. There is no clear answer to a question 'to which level the improvements in transport contribute to rural economy'. The fact that the improvements in transport can even increase the differences in information, transaction costs and market imperfections due to dysfunctional institutions, leads to a conclusion that the improvements in transport, although being able of promoting economic growth, can also increase rural differences and conflicts.

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