

# Availability Ranking and Regional Disparities of the Transport Infrastructure in Northern Hungary

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## SUMMARY

*Studies that analyze the economic impacts of the transport system mostly deal with entire countries or larger territories. However, the effects of the transport system on regions or sub-regions have increasing importance. The inadequate quality and density of the minor, access and connecting roads as well as the low quality of the transport services might be one of the most important reasons for regional disparity. As a result, the quality and quantity of micro-relations should be included amongst the aims of road infrastructure developments.*

*In the study I have described the availability position of the 174 Hungarian sub-regions. To streamline and enlarge the regional road infrastructure would be necessary to improve our competitive potential and also to assist and increase the economic development processes. Their economic, social and institutional terms have to possess satisfactory internal and external connections.*

*Keywords: infrastructure, regional development, availability, road network, location theory*

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## INTRODUCTION

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It is well established – according to several pieces of literature and references on the topic of regional development – that the quality standards of the transport networks have a strong connection with the economic situation of an area. Increasing mobility is a precondition for increased productivity and growth, and improvements in transport may in themselves promote growth. The infrastructural position is able to affect internal and external capital flows, as economic growth can assist the expansion of the networks. The transport system can also have an effect on the intensification of regional connections. Therefore, its development is becoming an increasingly important objective.

In my research papers, I analyse availability in terms of competitiveness, internal and external connections, and of choice of location. The main problems of the Hungarian regions – in infrastructural aspects – arise from the inadequate road and rail networks. Due to their bad condition, poor quality and low weight-bearing capacity, they are able to delay economical and social development to a great extent. This is mostly felt in those settlements that are situated on the periphery of the regions, in relative isolation.

Taking the North-Hungarian region as an example, it is mostly the inadequate density of the minor, access and

connecting roads that causes disadvantages, and it is the low-quality transport services in the rural areas that restrict economic growth. This might be a reason for areal disparity. The streamlining and enlargement of the regional road infrastructure will have to be a high priority in the future in order to improve the quality of life in these regions and ensure connections with the global economy. (Baum, Korte, 2002).

## COHERENCE BETWEEN AVAILABILITY AND COMPETITIVENESS

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Availability and the adequate infrastructural conditions appear in many sources as an independent term of competitiveness. During the survey of the other terms we have to take into consideration that, in accordance with the economic situation and its main scope of activities and realizable aims, different elements and service claims become the key issue and propulsive power for economic development in different time periods (Fleischer, 2003.). For the word ‘competitiveness’ there is not any consistent definition in economic literature. An ‘official’ definition by the OECD of a nation's competitiveness is "the degree to which a country can, under free and fair market conditions, produce goods and services which meet the

test of international markets, while simultaneously maintaining and expanding the real incomes of its people over the long term" (Lengyel, Rechnitzer, 2002).

Competitiveness equally requires innovation potentials, achievement, successes in business, and cooperation processes inside and outside of agglomerations, regions and national borders. It also means that, in line with their purposes, a branch of industry, a product or a kind of economic strength is able to constitute propulsive power for the business actors or institutions of the region. Consequently, an essential point is how the big business sector, knowledge-based innovators, and small and medium-sized enterprises are able to cooperate effectively (Vickerman, 2002).

Although infrastructural extension is reasonable in many ways – good availability and well-expanded internal connections are necessary preconditions for almost all developments – it cannot be conclusively declared that the network development of any transport sector has a positive effect on competitiveness.

Through competitiveness the term of availability also plays an important role in the choice of location. In these times, the tertiary sector dominates, product differentiation has the utmost importance, and – due to globalization – the role of the agglomeration economy, clusters, supply chains and cargo networks is increasingly vital. As a result of this, transport and infrastructural preconditions have a significant function. Although the infrastructure does not have an independent attractive force, it is able to operate effectively through its integration into economic systems and to promote regional development processes (Jensen-Butler, Madsen, 2005).

The transport network can be regarded as an optimal term as long as it is able to provide a satisfactory accessibility to the region or territory from other areas, and can allow an economical availability of several markets that are important for certain regions. These conditions may be met if the transport network of the area is an integrated part of the European networks and the connections are optimal for the territory (Vickerman, 2002).

At the same time, the fact has to be taken into account that the improvement of the micro-connections also plays an important role in the competitiveness of an area. In this regard, the minor road infrastructure and the local network system might become more necessary for the region than, for example, one of the trans-European transport corridors (Fleischer, 2003).

The utility of the infrastructural investments from the point of view of local or regional development is not obligatory. The model of Banister and Berechman analyses the coherences between the economy and transport investments. They introduced the open and closed system into the analysis of transport investment surveys. The system is called open when political and economical factors are secured (Figure 1).

The other important viewpoint is that of accessibility. Availability is not able to signify economic development

automatically, just in the cases where an open and dynamic system exists. In the second case, a well-developed transport infrastructure is able to support the development processes, but it is not an inevitable term. In the dynamic system, a positive effect might be partly discovered where the infrastructure provides just low-level accessibility – as we can see, in the first case the infrastructural investments have also high encouraging effects. But in other cases, the infrastructural developments are not able to result in economic development, because some other economic terms are missing (Tóth, 2005).

Open and dynamic economical system of terms	
<p><b>1.</b> Strong economic self-sufficiency and environment protection.</p> <p><i>Infrastructural investments have encouraging effects.</i></p>	<p><b>2.</b> International and national markets with development potentials.</p> <p><i>The well-developed infrastructure supports the development processes, but not as an inevitable term.</i></p>
<b>AVAILABILITY with low quality level</b>	<b>AVAILABILITY with high quality level</b>
<p><b>3.</b> The inadequate infrastructural terms conducive to the lagging behind, but only the infrastructural developments are not able to result economic boom.</p> <p><i>Lagged behind, isolated, static territories.</i></p>	<p><b>4.</b> In spite of the favourable conditions the further investments have low effects because of the lack of adequate economic terms.</p> <p><i>Lagged behind territories, exceptional zones near the junctions.</i></p>
Closed and static economical system of terms	

Reference: Jensen-Butler, Madsen, 2005.

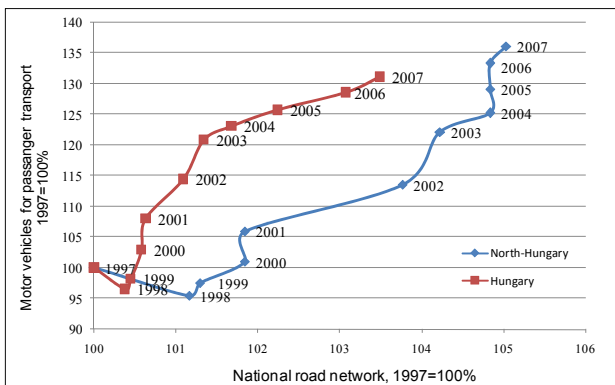
Figure 1. Coherence between the economy and transport investments

The infrastructural terms have important effects on the economic conditions of an area as discussed above. The different impacts mainly arise from the changes or developments of the transport infrastructure. When the transport conditions improve along with the availability and attractiveness of locations, prospective firms and consumers react positively. Changes in transport costs are able to have an effect on freight and passenger movements as well as on market size. Transport system improvements are able to increase the labour market and can have an influence on migration processes and also have an effect on the property and housing markets (Tóth, 2005).

These positive impacts – mainly the increased transport claims and mobility – also require the further development of the availability conditions. From the introduction of the availability terms, the spatial, temporal and qualitative terms are well separated. An improvement in all of these factors would be necessary to improve the competitive potential of a territory and also to assist and increase the economic development processes.

## INFRASTRUCTURAL TERMS IN THE NORTH-HUNGARIAN REGION

Accordingly, the adequate infrastructural terms are important indirect preconditions to improve the competitiveness of an area. The availability problems and the weak cohesion among certain areas are able to cause regional disparity inside a region. This problem can delay economic and social development to a great extent. But in every case we have to take into consideration that in addition to the infrastructural terms, other economic conditions have to exist to ensure the economic development of a region. In the case of some Hungarian regions, we can say that the availability through the road infrastructure is satisfactory – the extension of the regional network has been much faster in recent years than the national average, but inside the region many accessibility deficiencies exist (Figure 2). There is weak cohesion among certain areas that has a negative effect on capital expenditure and market relations, as well as on the quality of life.

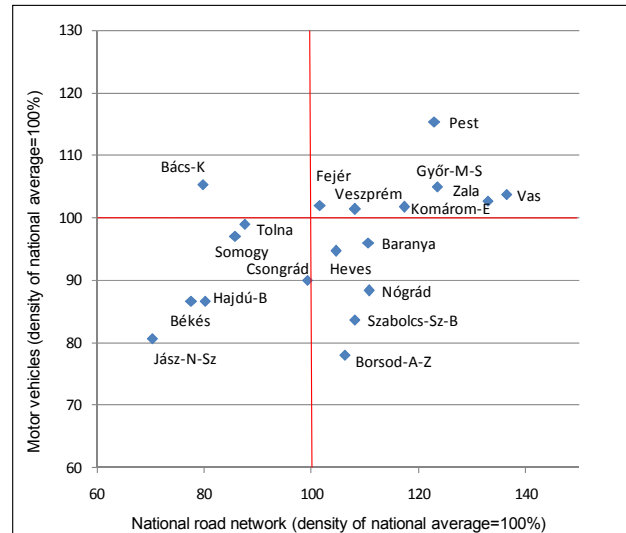


Reference: Hungarian Central Statistical Office – own calculation

Figure 2. Motorization and transport infrastructure tendencies

Taking the North-Hungarian region into consideration we can say that the highway that reaches the southern part of the region is not able to connect easily the micro areas of the central and northern territories with national economic activities. One of the main problems is that an adequate system of minor roads and other possible connections does not yet exist. As a result, foreign investors, who prefer good availability, might invest in other territories (Erdősi, 2005).

The availability of a huge number of towns in the region – mainly in the sub-region of Ózd, Bodrogköz and Edelény – is possible from only one direction. Several settlements of Nógrád County have the most disadvantageous position with extremely long accessibility times. Because of these, the western territories of the county build contacts with central Hungary instead of the North-Hungarian region – weakening further the internal connections inside the territory.



Reference: Hungarian Central Statistical Office – own calculation

Figure 3. Rate of road density and number of passenger cars in 2007 (national value=100%)

In my earlier research papers, I compared the regional and national conditions by using ten indicators of the road, and subsidiary, road infrastructure according to Bennett's method. I also mentioned some facts about the availability possibilities of rural areas through public transport services.

Taking the national value as a base, the road density and the stock of passenger cars have the following values in the case of the seven NUTS-II regions. Figure 3 shows how the number of passenger cars and road density values are related to each other. Central Hungary, and central and western Transdanubia are above the national average in both terms. The eastern part of the country is lagging behind the others. Here both the number of passenger cars and road density are under the average. This is also the case in Northern Hungary. As discussed above, all these factors might be linked to income conditions.

## AVAILABILITY RANKING WITH CENTRALITY INDEX

The Territorial Potential Model contains elements of mass (absolute volume of GDP or population) and distance. According to this model, territories that have the biggest potential are those that either have the greatest economic power or are near the centre, or both (Dusek, 2004; Nemes Nagy, 2005; Nagy, 2007).

This methodology - that could be used for defining centre and peripheries and is derived from Newton's law of gravity- states that any two bodies attract one another with a force that is proportional to the product of their population and inversely proportional to the square of the distance between them (Tóth, 2006).

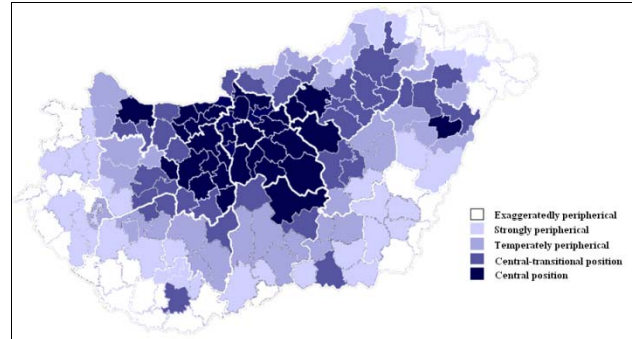
The Centrality Index contains own and inner potential values. The own potential shows the own availability terms (available population in space and time) inside the sub-region, the inner potential is given by the 174\*173 availability matrix (available population in space and time from the sub-region inside the country). In this way, we draw a distinction between the internal and external destinations.

The basic theoretical model takes the form of:

$$A_{i1} = \frac{W_i}{c_{ii}} + \sum_j \frac{W_j}{c_{ij}}$$

where  $A_{i1}$  is the availability index of i locality,  
 $W$  is the mass (population),  
 $c_{ii}$  is the travel time inside the given sub-region,  
 $c_{ij}$  is the travel time between i and j destination.

According to the population potential – which divides the scatter range of the Centrality Index into five classes – most of the sub-regions that are in exaggeratedly and strongly peripheral positions are located in Szabolcs-Szatmár-Bereg, Vas, and Somogy counties (Figure 4).



Reference: own calculation

Figure 4. Centres and peripheries (2007)

Table 1. Data by availability categories

Subregions (total)	Availability category					Summa/ Average
	1	2	3	4	5	
Distribution of unemployed persons (%)	18,9	21,0	18,5	21,4	20,2	100,0
Enterprises per 1000 inhabitants (pcs)	77	93	94	98	111	101
Income per capita (before tax) by availability categories (HUF)	1366072	1395031	1379380	1550994	1819759	1536123

Reference: own calculation

Notation:

1=Exaggeratedly peripheral    2=Strongly peripheral    3=Temperately peripheral    4=Transitional position    5=Central position

Regarding the Centrality Indices, the role of the capital city and its agglomeration is significant as well as that of certain county capitals. Since the point of the model is that those sub-regions which get in better clusters are able to reach greater mass in a given time-period, we can draw inferences about the connections between a local center and the neighbouring settlements. 60% of the Hungarian population lives in peripheries that are in a worse position according to certain indicators (Table 1).

It is also noticeable that the central and peripheral positions are always relative. In connection with the development of other territories, notions of what is an adequate or inadequate situation are always changing. In my further research work, I am going to analyze what the connection is between the centre and peripheries in geographical and economical mean.

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