Role of transport networks in supporting the spatial dimension of sustainability

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ROLE OF TRANSPORT NETWORKS IN SUPPORTING THE SPATIAL DIMENSION OF SUSTAINABILITY

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ABSTRACT

The main messages of the contribution in five points are the following:
(1) Besides temporal relations of sustainability, we also have to underline the importance of the spatial context of it.
(2) It is the internal network of a region that helps to preserve the structure and the existing connections within the region.
(3) The proper external connections of the region are also very important, but their positive effects can reach the given region only if the internal transmitter elements are existing and the region is able to adapt these effects.
(4) There is no such rule that the more transit (through traffic) would be better. The transport that exceeds the region's adaptive capacity is harmful for the local economy, society and environment alike.
(5) A newer and also important function of the transport management is to bypass those areas where the extensive traffic would be harmful.

1 INTRODUCTION

The necessity and importance of the transport corridors within the European Union was introduced from the point of view of the prosperity of a single unified European area, considering these corridors as effective internal links that makes the union more competitive relative to other poles of the world. Less effort was made to analyse the role of these corridors within the sustainable operation of the single member-states or regions. This paper deals with the spatial role of transport functions offered by different levels of transport networks in a region.

The frame of the description in the paper is the spatial sustainability, underlying the role of spatial links in two important activities, namely in spatial solidarity and in spatial self-defence. Distinguishing four possible statuses of the links relative to a region, the paper introduces in successive blocks the spatial sustainability expectations towards relations as the internal provision of a region, the external accessibility of a region, the crossing of a region and the bypassing of a region. Besides that theoretic approach practical cases are used as explanatory illustrations in 'boxes'.

The paper ends with a concluding block.

2 BESIDES TEMPORAL RELATIONS OF SUSTAINABILITY IT ALSO HAVE TO UNDERLINE THE IMPORTANCE OF THE SPATIAL DIMENSION

As a definition of sustainable development, it is customary to cite the Brundtland report to the UN (Our Common Future 1987 [1]): "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to

meet their own needs." This Brundtland definition actually underlines the *time* dimension of sustainability, taking care on the environmental conditions of the future generations as the requirement of the *intergenerational solidarity*.

What is discussed far less often from the aspect of sustainability is the similarly important role of *intra-generational relations* that is those evolving between people living at the same time. Sustainability also demands that the needs of those *living here* be met without compromising the ability of those *living elsewhere* to meet their own needs. 'Elsewhere' may be a wide range of distances away: from faraway islands in Oceania (if climate change is at stake, for example) to neighbouring districts, or to an adjacent street, to which traffic flows is diverted, or even a roadside stall or store where passing traffic makes conditions impossible.

While at first this spatial requirement looks very similar to those quoted from the Brundtland report, it is worth emphasising that while the intergenerational connection is a one-way relation (our responsibility for future generations, who can't do anything for us – as same as we, of course, can't do anything for the generations which much preceded us); the intra-generational relation has two directions: the requirement of our solidarity is one of them (that is we should not exhaust resources, depriving others of them, and we should live so as it does not make the living conditions of others impossible). However, this is not all, as the reverse also can happen: the activity of others can also restrict our circumstances and opportunities. We may count on their solidarity, but this is not enough, we must also do something for defending our environment. Sustaining our activity in a changing environment besides the solidarity we need also a kind of intra-generational *self-protection* or spatial self-protection.

Manuel Castells [2] introduced a pair of concepts of undoubtedly fundamental importance which helps a great deal in understanding this domain of spatial sustainability. "*Space of places* must retain its autonomy and its meaning independently from the evolution and dynamics of the *space of flows*" By the 'space of places' we understand the physical space around us, our everyday environment, which has meaning and significance for us. The 'space of flows' is the field bearing the external impacts exercised on this environment. To avoid misunderstandings, it should be pointed out that Castells does not suggest exclusion on the grounds of defence, does not want to exclude external impacts and does not deny the possibility of internal changes, but warns of the need for harmony and scale. External impacts can only be absorbed to the extent that internal structures allow; or vice versa, the internal structures need to be prepared to absorb a specific external impact. *Too strong or too sudden external impacts do not serve but rather disintegrate internal relations and structures* – defence is needed against.

This apparently totally theoretical approach alerts us to extremely important practical actions that need to be taken in terms of transport networks. The space of places and the space of flows can both be translated to the transport and economic relations of a region. In other words, the system of connections *within a region* is able to explore, supply and strengthen the space of places, while for the space of flows roads *approaching, crossing and bypassing* the region provide physical opportunities to develop. Categorising both the 'spaces' and the 'roads', however, is relative: what may be an internal connection for the whole region is an external approach or even through traffic from the standpoint of a town. Accordingly, neither the 'space of places' nor 'the space of flows' are absolute categories, and for this reason it is not possible even in principle to express a complete and unilateral priority in favour of one of them.

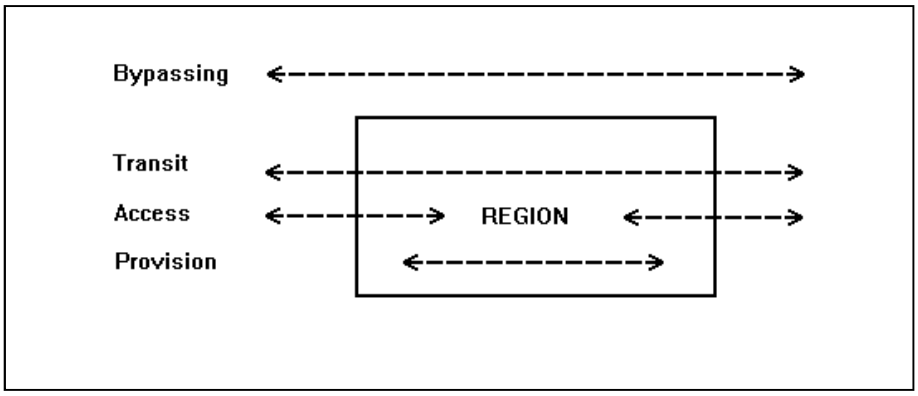

Fig. 1: Different network relations, relative to a region [3, with own additions].

In the further blocks we describe more detailed the role of the different above distinguished transport relations: – internal provision, accessing, crossing and bypassing – in the sustainable operation of the region.

3 IT IS THE INTERNAL NETWORK OF A REGION THAT HELPS TO PRESERVE THE STRUCTURE AND THE EXISTING CONNECTIONS WITHIN THE REGION

Two theses are underlined in connection with the internal provision of the region:

-The existence of a proper internal network is a precondition of the harmonised operation of a region.

-It is the pattern of the internal structure that is determining whether the given region becomes operable.

3.1 The existence of a proper internal network is a precondition of the harmonised operation of a region

Ultimately, in the internal life, in the good operation of an area, it is not the good operation of the transport networks that is important, but that (expressing from the transport's point of view) the world of *the starting points and the destination points* of the transport should be living in prosperity. Still our statement is that the existence of the proper physical networks is a fundamental condition of that kind of operation. Naturally this does not mean that it is the construction of the physical networks that *creates* the internal activity, the connections, but it means that the luck of the networks can hinder the development of the internal relations; what is more a missing physical connection, which is able to display even existing relations unreasonable. Here there is a kind of mutuality: namely the formulation of small-distance neighbourhood (economic, cultural etc.) connections and the construction of the similar level physical connections are able to amplify the started processes if there is a harmony between these activities (positive feedback). If, in turn, this harmony is slacken, if the organic construction of the local structures ends, even the existing connections develop back, affecting also the structure this latter becomes inorganic, collapses, doesn't protect any more the internal values of the area (this is also a positive feedback, but this time leading towards collapsing).

The physical networks of a region preserve the paths of earlier connections as a *memory*, and make it easier to sustain or create again similar relations. Just because of their such features, the networks are able to function as the *structural elements* of the culture of

connections promoting the cohesion, the co-operation of the given area, the creation of characteristic activity profiles, the accumulation of events following each other. In case of all networks it is the "world of destinations" (that is the services to be achieved) offering the real sense of the transport. It is the fine capillaries of the network that are serving these destination points; it's the *internal provision networks* of an area that is able to get into local interactions.

Box 1: A provision case: the Polish rail network and territorial development

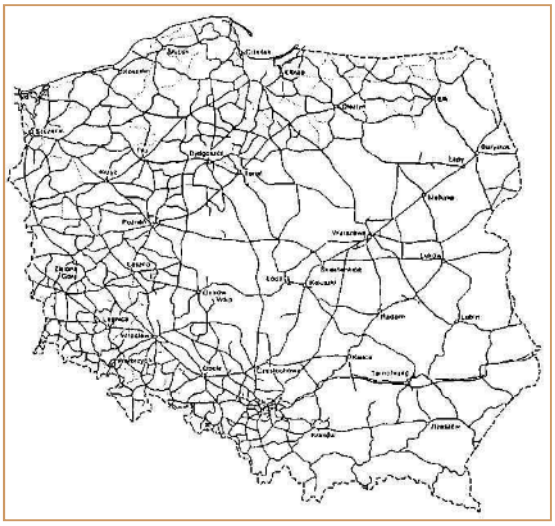

Fig. 2/a: The different network patterns of the western and the eastern side of the Polish railway network [4]

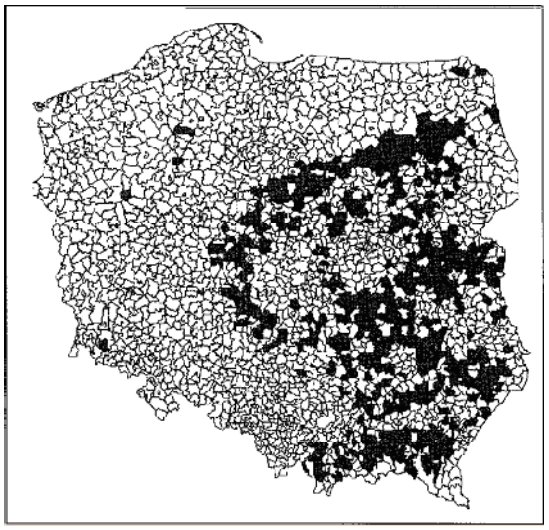

Fig. 2/b: The 20% of the Polish gminas with lowest own income per capita, 1998 in black [5]

Figure 2 presents the Polish rail network that was constructed in a period when Poland as such didn't exist, but was shared between neighbouring empires. The rail network mirrors the connection structure and development pattern of the given region of those times and preserved this structure for more than a century. As *Fig 2/b* presents, the development of the settlements still follows the same borderlines after a century. Just to make it clear, we do not want to say that it is the rail network that made the western part richer, or that construction of dense rail network would help developing the eastern side of the country now. The statement or hypothesis is still, that if the transport structure wouldn't have served the more developed economy in its due time, the region couldn't reserve its more developed status for so many decades.

It is only regions disposing with an internal structure that has the chance, that in a coherent way could select the inflows arriving from the outer world, and by that at least to a certain extent could influence the events, consequences that effect the region.

3.2 It is the pattern of the internal structure that is determining whether the given region becomes operable

The pattern of the internal physical structure within a region shows a kind of similarity with and reflects the patterns of the activities. If the activity- and relation network is single-centred and hierarchical, the constructed physical structures will also be single-centred and hierarchical; what is more, they will promote the further springing of similarly structured activities.

A characteristic feature of the strictly hierarchical structures is that their nodes are not substitutable, they are unavoidable. Consequently these nodes are getting into key position**:** all other nodes at a lower level get to a defenceless position relative to them. This same feature that is the low degree of freedom makes on the other hand the operation of the hierarchical structures rigid, clumsy and resistant to any change, and also vulnerable and inflexible from the point of view of survival.

The literature dealing with networks supports the multi-path networks instead of the single-way forced connections between the elementary nodes. Still, there are obstacles to implement simple changes, as the existing network structure offers *key-positions* for the higher level nodes and those enjoying that positions tend to manifest resistance against any change.

The classical contrast of the hierarchical network is the grid structure. It is the substance of the grid structure that the various points of the region are approaching similar provision situation at least as far as it is possible, that is the structure decreases (and not increases) the differences between nods that were determined by their position/local arrangement.

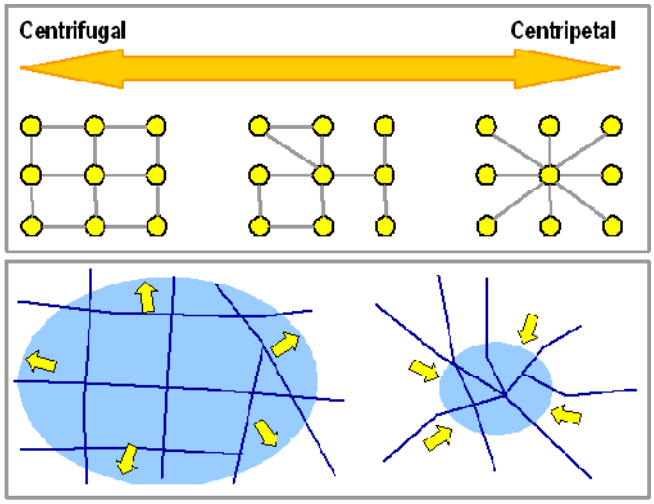

Fig. 3: The distinction between centripetal and centrifugal networks [6]

Using Rodrigue's handbook [6], *Figure 3* interprets the distinction between the effects of the hierarchical and the grid structure, the different spatial consequences here named as *centripetal* and *centrifugal*.

Box 2. The internal pattern case: the development of the Hungarian road network

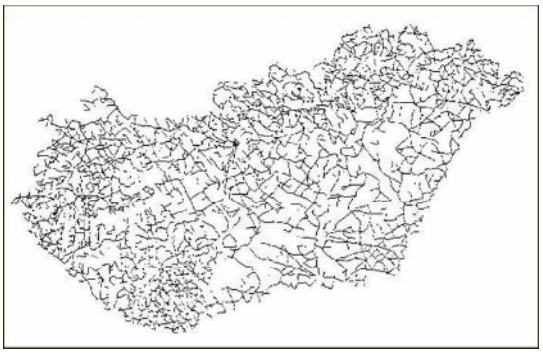

Fig. 4/a: The secondary road network of Hungary preserved the imprint of the cart tracks connecting villages [7]

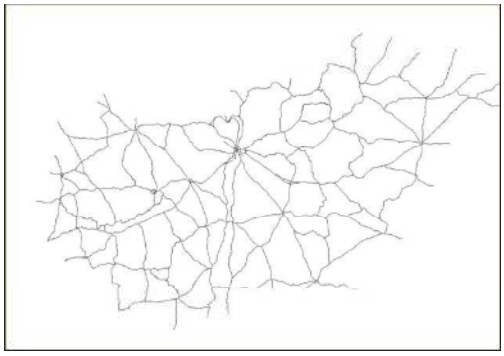

Fig. 4/b: The main road network created a new structure while interconnected towns to towns [7]

The history of the Hungarian transport network offers a good possibility to present the evolution, the consequences and the path-dependency of a hierarchical structure. The secondary road network of Hungary preserved the imprint of the once cart tracks connecting villages to each other. These tracks followed the topographical and soil endowments, and were also determined by the frontiers of the landowners' estates (*Figure 4/a*). As a contrast, the main roads constructed from the mid-19th century could create a totally new network structure when interconnected urban centres to each other rather than villages to villages. This structure formed a hub-and-spoke system as the links could be straightened, diverging from strict topography by cuts and fills, changing the soil too or expropriating lands if it was necessary (*Figure 4/b*). This structure (together with the similar rail network) successfully advanced Budapest to become a regional urban centre, but after a while it was also clear that the country become over-centralised.

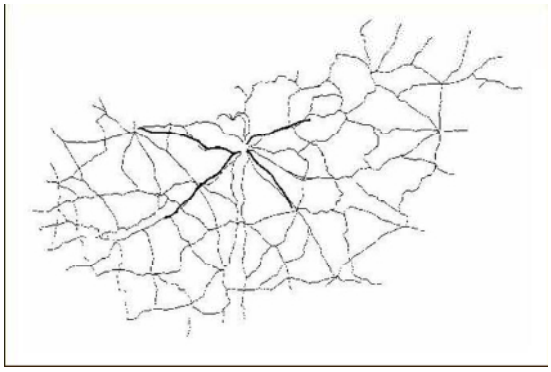

Fig. 5/a: The Hungarian express- and motorways by 1990 [7] and **5/b:** by 2010 [8]

The third transport level, the inter-regional road system (motorways connecting regions to regions) didn't create a new structure in the country, but it has been built along the most important main roads (*Figure 5/a and 5/b*). The reference was that the main traffic flow uses this main road network and the task of the motorways was to ease the main roads from the traffic overload. After almost half a century of development the Hungarian motorway system reinforced the hub-and-spoke character of the road network and established a more centralised system than ever existed.

The network constructed in the recent decades served much more the access of the country and its regions than the provision of the local life.

4 THE PROPER EXTERNAL CONNECTIONS OF THE REGION ARE ALSO VERY IMPORTANT, BUT THEIR POSITIVE EFFECTS CAN REACH THE GIVEN REGION ONLY IF THE INTERNAL TRANSMITTER ELEMENTS ARE EXISTING AND THE REGION IS ABLE TO ADAPT THESE EFFECTS

As for the accessibility of a region three theses were established to explain.

-The multi-directionality of the accessibility is of basic importance for the development of a region

-Among the external relations a difference has to be taken between large scale backbone relations (linking regions by corridors) and neighbour relations (an extension of the internal provision links)

.The symmetry or the asymmetry of the impacts depends on the difference in the development level of the interconnected regions.

4.1 The multi-directionality of the accessibility is of basic importance for the development of a region

We stressed above the importance of the internal relations, but *not against* the external accessibility of the area. On the contrary, for the development of a region it is essential that the external relations could offer a good service. Just in order to utilise it, it is necessary that the internal structure is able to absorb the arriving goods and effects, and that there is a structure in the region, where the new results can be built in.

Based on all these above, it is clear that the regions are also interested in the fact that they dispose with a good accessibility. As a measure of the good accessibility, for the whole of the region we underline the same point, the *importance of the grid structure* that was also a measure of the good provision within the region. Namely here we underline the importance of the multi-directionality and the multi-laterality of the external relations. A region is able to combine well its positive endowments with the external inflows, if the connections are not forced ones that is the region itself disposes with a possibility of choices and considerations between types and directions of relations. It is evident, that the multi-directionality of the relations also brings physical security advantages (the blockage of a single route can't isolate the whole region) but in the practice an even more important danger is the economic, social and psychical dependence that follows from the forced connections.

4.2 Among the external relation a difference has to be taken between large scale backbone relations and neighbour (co-operation) relations

Above we spoke generally about the external relations of an area. It is still useful to distinguish two levels of these relations.

One level is represented by the relations offering the main flows between regions, generally by *higher level backbone connections* on the main networks. This level both in its system and in its physical characteristics diverge from the internal provision networks that serve the local connections.

The other level is represented by the extension of the internal provision networks that is by the interconnection of the internal networks through the frontiers of the regions. Such kind of interconnections make it possible for unites (e.g. for villages) at the border area of regions to dispose with the possibility of the multilateral connections, also ensuring that this

neighbouring co-operative traffic shouldn't be forced to take roundabout ways and shouldn't load the routes constructed for long-distance traffic. On the other hand the continuous character of the secondary network makes this level capable to serve as an extended and interdependent puffer system (e.g. for using by cyclists).

4.3 The symmetry or the asymmetry of the impacts depends on the difference in the development level of the interconnected regions

After underlying the importance of the connections of accessibility, we also have to draw the attention to a danger. During the whole history, the construction of the main roads of interconnecting regions represented a kind of *imperial domination* factor too. For Rome it was the amalgamation of the empire that needed the construction of the roads where the legions could quickly advance. During the flourishing period of Rome these roads served the conquest and the maintenance of the dominance, – but these same roads were also used by those barbers invading the empire in the period of the collapse. That is, *the road always strengthened the position of those more powerful*.

In the case of roads connecting regions of similar development it is expectable that the advantages that follow from the improvement of the connections will also be divided symmetrically between the regions affected. This situation characterised the earliest phase of the trans-European network interconnecting the most developed countries of the European Communities.

The situation is not so clear-cut when we look at the routes *interconnecting developed and less developed regions to each other*, or improving the accessibility in such situation. In such cases – now already in economic terms – it can happen that the distribution of the advantages is not just asymmetric, but it can prove to be definitely disadvantageous for the less developed region, as the course of the development can become deformed there, by creating an enclave area separated from the rest of the local economy and by not decreasing but increasing the external dependence and defencelessness of the region.

Above we have already dealt with a significant element of the self-defence of an area, the importance of the internal structure. Here we can add that the existence and operation of an internal structure can also be considered as an indicator of the level of development of the given area. In the period of sudden changes of the external structure, it is the obligation of those living in the region to estimate which measure and pace from these changes are tolerable for the internal structure; and also to decide the developments and restrictions that are able to promote that the internal structure is able to keep abreast of the demands of external changes.

Box 3: The evolution of the European corridors

The guiding principle at the development of the railway networks from the 19th century onwards as well as of the main highway networks was the creation of the internal connecting system within each country as well as access to the sea ports ensuring exports and imports. Other forms of the international connections were but accidental and emerged much later. Even in the western part of Europe the creation of a uniform system of transnational corridors was the task of the late 1980s ("Single network for the single market").

Perhaps the 1975 renumbering of the European road system, replacing the London-centred radial system and indicating the east-west directions with numbers ending in '0', and the north-south directions with two-digit numbers ending in '5' can be considered as the starting point of the decade later corridors thinking. (*Figure 6*.)

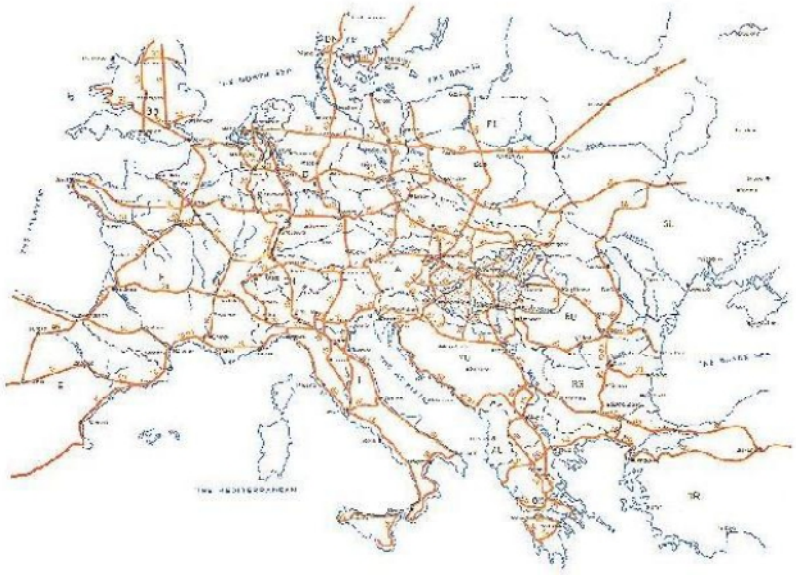

Fig. 6: The main international roads of Europe as renumbered in 1975 [9]

The process crystallised into the overlapping infrastructural corridors of the Trans-European networks (TEN) by the time of the Maastricht Treaty of 1992. At that time the Union meant 12 countries, already thinking in terms of an expected enlargement in 1995. As for the transport network (TEN-T) there has been gradually less talk about the networks itself, but 14 selected projects came into the foreground of attention from 1996 onward (the number of selected projects was increased to thirty on 29 April 2004).

By the time the ideas of the TEN corridors became Union documents in the 1990s, the map of Europe has been changed and following the political changes it became obvious that one should think in terms of a larger Europe than ever before. While the approval of the TEN concepts forwarded on its Union track, a process of negotiations called Pan-European transport conference was launched in 1991, during the course of which (1991: Prague, 1994: Crete, 1997: Helsinki) delegates of the respective specialists of ministries accepted the plans of the so-called "Helsinki corridors", or "Pan-European corridors" in three steps, – in other words, the eastern extension of the TEN-T has been born.

What does that eastern extension of the TEN-T mean? The eastern extension of the TEN-T would have been a kind of network presented on *Figure 7* that is an adoption of the principles that were used to create a common network for 15 countries, but now in a larger space.

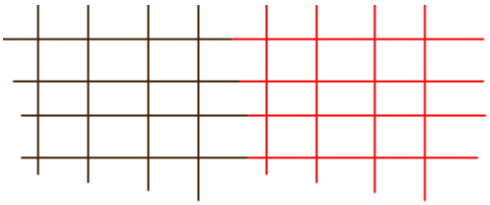

Fig. 7: The correct extension of the TEN-T network for a larger European Union

Instead of the eastern expansion of the TEN-network, priority was taken rather to the extension of the east-west corridors of the TEN-T, urged both in the eastern and western side. More exactly the extension of the east-west corridors did not restrict to just the planning of east-west parallel lines, but as investors from Italy wanted to go also to north-east and from Germany to the south-east, *Figure 8*, interprets better what really happened.

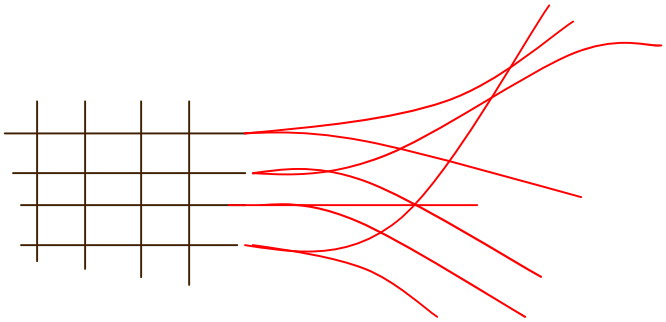

Fig. 8: Extension of the East-West corridors of the TEN-T'92.

In the actual Pan-European network there are no north-south corridors with the exception of corridor 9 (linking Finland and Greece), there are only ones going east from the Union, then turning to the north or to the south (*Figure 9*). Though from the pieces of the latter ones a north-south connection can be established, visibly it is more accidental than planned. At any rate, whatever has emerged is far away from a grid network that could also have served well the internal connections between the eastern member states of the union. The effect of that kind of extension process can be summarised as the dominance of the "space of flows" over the newly joined eastern regions of the union.

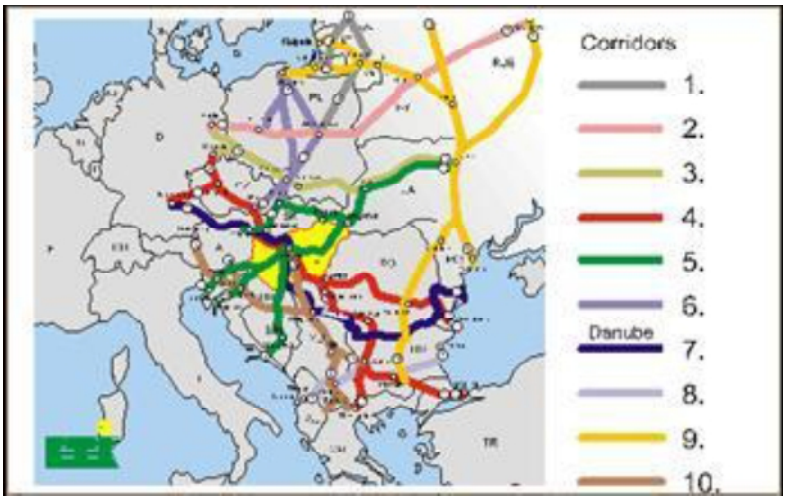

Fig. 9: The Pan-European (PEC; or Helsinki) Corridors [10]

5 THERE IS NO SUCH RULE THAT THE MORE TRANSIT (THROUGH TRAFFIC) WOULD BE BETTER. THE TRANSPORT THAT EXCEEDS THE REGION'S ADAPTIVE CAPACITY IS HARMFUL FOR THE LOCAL ECONOMY, THE SOCIETY AND THE ENVIRONMENT ALIKE

In this block one single thesis summarises the main statement.

5.1 The through traffic has to cross a region with the minimal possible disturbance of the internal circumstances

The stressed mentioning of the role of the internal structure does not mean that the through traffic or transit traffic across a region could be excluded or disregarded, or shouldn't have to deal with that. It has to be even underlined, that the central position of a country is a positive endowment; similar to those kind of advantages as for example *the richness of a region in raw materials*. But this analogy must be continued: it is a general experience that in the long run all those countries that tried to base their future exclusively on the direct sale of their raw materials were lagged behind. The advantages due to the use of the raw materials are realised in those areas, where the materials are processed into end products in the frame of a widespread activity field. Quite similarly, the advantages of the transit role cannot be realised by the direct sale of the "raw material" – of the transit corridor – but it is necessary that the very *region is able to catch the possibilities that the transit corridor means*: developing a local economy that is able to build in, absorb the advantages arriving there. For all this it is a supporting background, if the region disposes with a proper internal structure, a local system of connections.

The defence, maintenance and development of the internal structure requires that the real through traffic flow don't get into contact with this structure, but cross rather the region *with the possible minimal harm*, with a minimal disturbance of the internal circumstances. Three considerations follow from this principle relating the transit traffic: namely a quantity, a modal split and a network forming one.

To make an end of the myth of the quantity ('more crossing traffic brings more benefit'). Above all, we must avoid the vulgar error that it would be the interest of a region, to attract the biggest possible flow of the through traffic crossing the area. As an example we can refer here to the situation of the Hungarian tourism sector. By the statistics of the 90s, it was 2-3 per cent of the international tourism of the world that crossed Hungary (in number of tourists); while from the total world income of the international tourism an order of magnitude less share, a few per mille [%o] has got to the country. The income can not be increased by trying to further growing the *number* of those arriving into the country, as it wasn't the quantity of the through-put but rather *the absorbing capacity* of the tourism sector that limited the development. This later should be upgraded approaching by that a better balance between the internal structures and the external demands. Similar diagnose could be given more generally about the relation of the traffic and the local economy: there are no real country interests in serving a flow of goods that exceed the internal absorbing capacity of the region or country. *The through traffic can't be eliminated, but no effort should be taken to attract as much of them as only possible*.

Better modal split considerations are necessary in serving the through traffic. In order to decrease the troubling effects of the through traffic, it is desirable to assure that the

biggest possible share of the trunk and through transport *slip to more environment friendly modes* (the reconstruction of the poorly maintained main railway axes should have a priority over the construction of parallel motorway corridors in Hungary: just inversely as it is happening).

The through and the local interest traffic should be separated in its system. The defence of local structures against the impacts of the through transport is served by a network formulating consideration, namely by the *systemic separation of the through and the local interest traffic*. In the case of roads that means the distinction by function within the road infrastructures. At a first sight this seems to be a wasteful solution, but in the reality it is not just useful, but also fits to historical practice. Above *Box 2* presented how the local (secondary road) and countrywide (main road) system was separated not just in its function but also in its structure. A similar process would have been expected when a new network level, the system of motorways was created, aiming to connect regions to regions in a supranational field.

Box 4: European corridors cross Hungary through its most heavily loaded areas

The motorways that were constructed in Hungary followed quite a different logic from the separation of functions. They were built parallel to the most loaded suburban main road sections leading to Budapest, where the capacity of the main roads was exhausted. These corridors didn't form a new structure at all, just the contrary they maintained and intensified the Budapest-centred structure of the road network. Besides other problems this construction blended the functions of the main roads and the motorways and by that also blended the local destination and the through traffic.

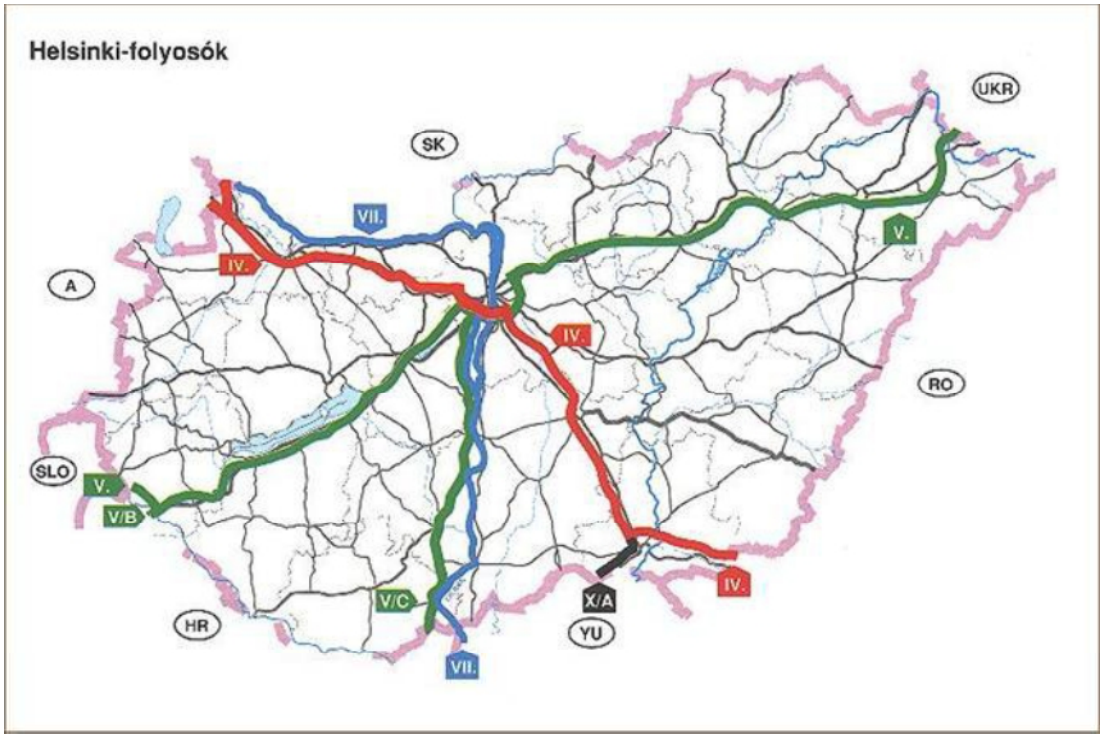

Fig. 10: Helsinki corridors on the Hungarian road network, (corridors IV, V, VII, and X/A) Hungary planned and by now leads the transit traffic through its most heavily loaded areas that would have needed protection rather than further traffic [11]

6 A NEWER AND ALSO IMPORTANT FUNCTION OF THE TRANSPORT MANAGEMENT IS TO BYPASS THOSE AREAS WHERE THE EXTENSIVE TRAFFIC WOULD BE HARMFUL

As for the bypass of a region two theses have been established.

-The defence from the harmful effects of the transport sometimes demands that corridors bypass rather a region than cross it.

-A corridor is able to serve a wider zone with its specific function on its both sides. It is positively wasteful to settle the corridor narrowly along a barrier that hampers the corridor to serve one side.

6.1 The defence from the harmful effects of the transport sometimes demands that corridors bypass rather a region than cross it

It was important to understand that a corridor needs good contact to lower level transport elements that transmit the effects between the corridor and the final destinations, and that it is not the task of a corridor to deserve directly those final destinations. Looking from the other side, the world of the served final destinations needs but that portion of traffic that gets into contact with, while all other flows are troubling factor in its environment.

The enclosure is harmful for a region, the possibility of the external access is of great importance, even the multi-directionality of that access is important. There is still a limit of the advantages of the openness: the too much crossing traffic is also harmful in the life of a region. The corridors behave as the large industrial factories: they are necessary but otherwise it is better to live at a distance from them.

The defence of a region's life and prosperity needs a slight over-capacity to build up: good access for all those who has to reach the different zones within the region, and also a possibility to bypass the region for all those not need to get in. Such kind of defended zones were first established in cities: traffic free downtown zones, calmed traffic residential areas, then bypass roads around whole settlements in the main road network.

A relatively newer turn is that whole busy regions can be bypassed in order to defend them from the overflow of traffic.

6.2 A corridor is able to serve a wide zone with its specific function on its both sides. It is positively wasteful to settle the corridor narrowly along a barrier that hampers the corridor to serve one side

The inter-regional/international corridor is an indirect, higher-level connection; its task is not directly serving the destinations, rather supplying a wider area in improving the external connections of the local networks (by relatively few corridors). Gutiérrez and Urbano [12] estimated this area 40-40 km on both side of the corridor. One useful outcome is to control on a map, which part of a region or country is already covered and where are the poorly served zones [12]. Another feedback possibility in planning is that if an area is well covered by different direction corridors, it is not worthy to build a newer one in the same area.

Box 5: Austrian example at the Neusiedler/Fertő lake and Hungarian corridor along the Lake Balaton

The Neusiedler/Fertő lake is located at the Austrian–Hungarian border, the bigger part of the lake is in Austria. By now here the close coastal roads along the lake are closed from the motorised transport, the traffic has to use those roads few miles away from the coast (*Figure 11/a*). The earlier history of the lake (higher water level, the settlements are at a distance from the coast), eased to establish such an order on the Austrian side.

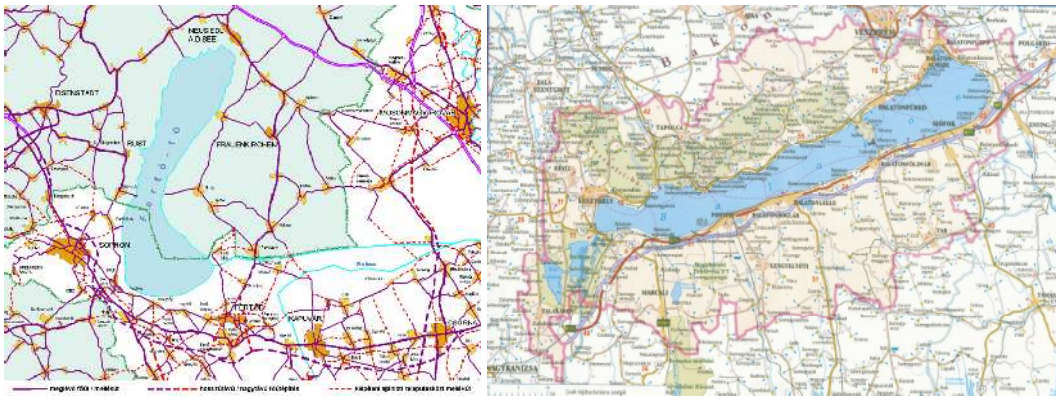

Fig. 11/a: In the case of the Neusiedler/Fertő lake on the Austrian side the motorised transport has to use the routes at a distance from the coast [13]. **Fig. 11/b:** At Lake Balaton the motorway was built directly besides the coastal settlements [14]

As a counter example at the southern side of the Lake Balaton even the motorway was built directly along the coastal settlements in the last decade (*Figure 11/b*), while the Lake Balaton Resort Area itself has a fifteen miles width and a more balanced settling of the road could better serve the whole area. *Figure 12* presents the "accessibility of motorways" showing those area that can be reached from the corridor in 15 and 30 minutes. It can be well seen, that along the lake the motorway works but for one side: the same amount of constructed road could have cover a twice bigger area if the road had bypassed the coastal area at distance.

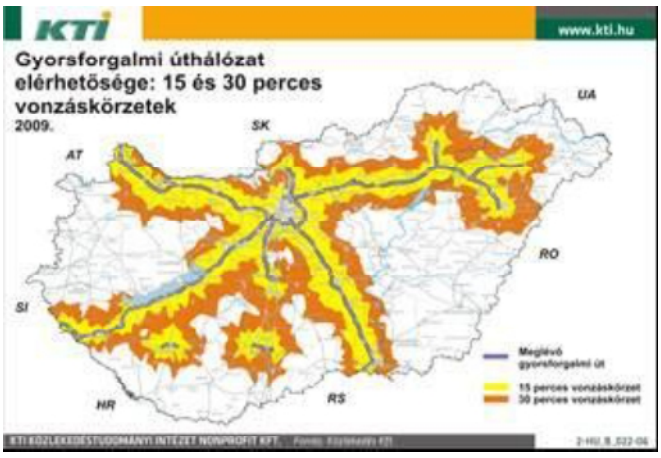

Fig. 12: "Accessibility of the express road network" 15 and 30 minutes accessibility areas. [15]

7 CONCLUSIONS

Good cooperation and widespread common production within a region is promoting the region's prosperity and the better use of the local resources. The European Union needed effective internal links to become more competitive relative to the other economic poles of the world. This was the basic idea behind the establishment of the trans-European networks of the 12 EU member countries in the early 90s. With the spatial extension of the union the same principles should have been adopted both to the increased whole EU area and also to its regions. Instead the extended corridor plans switched rather the new territories to the core-area of the union, while didn't really provide for the sustainable operation of the whole area or of its single regions.

This paper underlines the importance of the *spatial context of the sustainability* and begins with a general description about how the transport infrastructure is able to serve the spatially sustainable development of an area. The frame of the description is the four possible relation between the linear infrastructures and the region's area namely the internal provision of a region, the external accessibility of a region, the crossing of a region and the bypassing of a region.

The *internal network of a region* has a key role in strengthening a structure for the region and in keeping up the existing connections within it. Beside the existence of the internal network the hierarchical or grid- pattern of its structure is also a determining factor in its spatial effects.

For the *external accessibility of a region* the starting requirements are the same as for the internal one: the existence of several accessing links and an external grid structure around the region. It is important to underline again that the expected advantages can't influence the region's life if there are no internal transmitter networks to pass it to local destinations. Another important lesson is that the improved link between a developed and a less developed region brings asymmetric impacts for the two ends of the connection.

The possibility of *crossing a region* is required, but there is no sense to fight for the bigger volume of the through traffic. Both in its mode and its placement it is desired to lead the through traffic with minimal connection to localities to be defended. The traffic that has no local destination is harmful for the local life of the region.

The harmful effects of the transport to certain areas may need that *corridors bypass rather the region* than cross it. It is also useful to distinguish two types of zones along the corridors: a wider zone that is served by the corridors function and a narrower zone that is directly touched by the harmful effects of the heavy traffic flow.

The SoNorA process supports the construction of an important missing north-south corridor at the eastern edge of the EU-15 area. By that activity this process provides contribution to make the TEN-T network more grid-like. In the same time the corridor wasn't deduced from a comprehensive EU-wide grid structure. As such the action wasn't able to contribute to a development of the European or Central-European thinking on the corridor's role in the regional development. The corridor remained a little bit mysterious 'good' – something to be fight for – and the whole issue remained also separated from the other levels of the transport networks as if the state of the joining transport element and the adaptive capacity of the crossed regions (and by that the real advantages that the corridor can mean for a region) weren't really be common or *European* issues.

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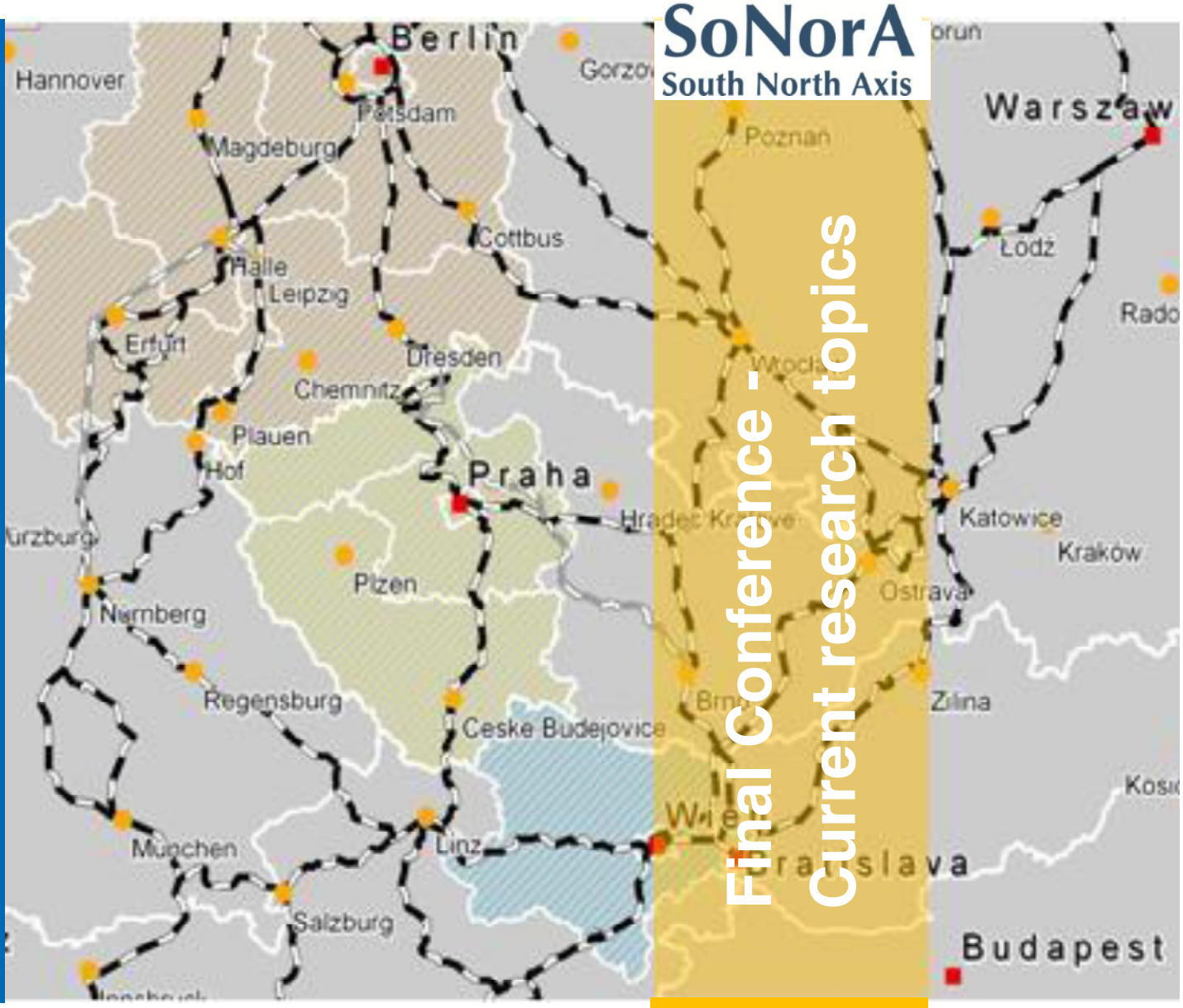

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