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ID 1397 | INTEGRATED SPATIAL AND TRANSPORT DEVELOPMENT IN EUROPE: THE EXAMPLES OF TWO EUROPEAN CORRIDORS

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1 INTRODUCTION

In order to better understand the impact of infrastructural improvements on spatial development, we can make the illustration of our planet as our own body: the skeleton is made of roads, railways, air and sea ports; the vascular network consists of gas and oil pipelines and electric grids, while the nervous system is based on internet cables, satellites, data scanners, etc. In sum, infrastructure, being it an instrument of physical connection, energy supply or information share, is an underlying factor generating the connectivity – the key asset class of the 21st century. Thus, the infrastructural upgrading, as it enables all other sectors to function properly, is recognised as one of the 19 UN Sustainable Development Goals.

Looking back through the history of European 'rise and fall', after each critical period Europe started to renew itself by improving the transport corridors. In other words, Europe has a long tradition in understanding the infrastructure, in particular the railway transport infrastructure, as a tool for achieving prosperity and stability – first transnational initiatives date back to the end of the 19th century. However, the coordinated action regarding the development of transport infrastructure in Europe started in the 1980s with the European Union (EU) TEN-T (Trans-European Transport Network) policy clearly addressing the main objectives of European development – economic, social, and territorial cohesion. The first initiative was the PEC (Pan-European Corridors and Areas), developed during two Ministerial Conferences – in Crete (1994) and in Helsinki (1997), with the aim of connecting the EU-15 with the then neighbouring countries. At the same time, the TINA (Transport Infrastructure Needs Assessment) process started in 1995 focused on strengthening the linkages within the eastern part of Europe (EC, 2011a; Commission of the European 1 INTRODUCTION

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2 THE COOPERATIVE APPROACH FOR INTEGRATED SPATIAL AND TRANSPORT DEVELOPMENT

Integrated spatial and transport development is considered a challenging task. This is particularly true if we take into account the territorial scope associated with such a development, different contexts (political, social, economic), and finally different ways of 'how thing are done' (Faludi, 2005), i.e. the planning cultures. Therefore, one of the most demanding issues, besides the compliance of infrastructural equipment and technical specificities, is the question of the governance of such a development (Peric, 2016b). How to achieve effective cooperation among a number of nation states? How to integrate the visions of various sectorial departments at the state level? And, how to make the consensus-based decisions among the various parties involved in certain urban development? The following lines describes the most important levels and types of cooperation needed to be taken in due account when in comes to the integrated spatial and transport development, as provided in Figure 1.

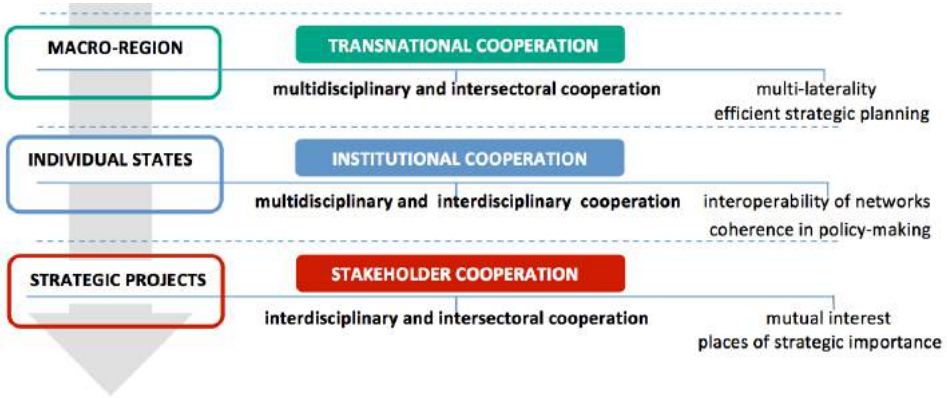

Figure 1 – A cooperative approach to integrated spatial and transport development
(Source: Peric, 2016b)

2.1 TRANSNATIONAL SCALE: MACRO-REGION

According to the research in the field of transnational (macro-regional) projects, the main problem is that there is no sufficient cooperation among numerous countries, which participate in these (Colomb 2007; Perkmann, 2003; Scholl, 2012). In a narrow sense, all the achievements and project results usually stay within one country, without their effective dissemination among other project participants. Briefly put: transnational projects are not truly transnational, since they usually remain at the level of 'exchange of experiences' on domestic issues (beginning phase) and seldom reach the final phase of the process − making a transnational strategy (Colomb, 2007). Therefore, it is necessary to implement multi-lateral and strategic approach, which, on the one hand, includes relevant representatives stemming from various expertise domains (transport, spatial planning, economy, sociology), and various sectors (public, private,

and civil). Usually, at the transnational scale, only the voice of official government representatives and public enterprises are heard, neglecting the fact that large-scale development usually depends not only on public money, but more likely on private funding.

2.2 NATIONAL SCALE: INDIVIDUAL STATES

Transnational cooperation and its outcomes affect the institutional and policy change, observed at the national level and lower levels of governance (regional, local). Actually, transnational cooperation has an impact on the extent of synergy between different governance levels within the nation states. The changes can be seen in formulating the new integrated policies (e.g. integrated spatial and transport policies) or stronger cooperation among existing institutions (e.g. spatial and transport agencies). Nevertheless, the implementation of decisions made at the transnational level often depends on the planning culture − the way of understanding the problem and the usage of specific planning methods and instruments of the individual state (Scholl, 2012; Getimis, 2012; Friedmann, 2005). The compatibility of national policies with the transnational strategic planning goals is very 'state-sensitive' and demands knowing the broader context of socio-political circumstances in which spatial planning policies are made (Savini and Ovink, 2012). Therefore, in order to achieve the coherence in policy-making, a multi- and interdisciplinary cooperation (at the entire national scale, or among the regions within the state) is a must.

2.3 LOCAL SCALE: STRATEGIC PROJECTS

The easiest way to understand the close relationship between the improvements in transport infrastructure and its effect on spatial development is to observe their interconnection at the level of strategic nodes, i.e. specific, flagship projects in particular places (Scholl, 2012). An example of such a project can be the redevelopment of the railway station and, consequently, urban growth of its catchment area. More precisely, such infrastructural developments contribute not only to creating the transportation hubs, but also to generating the new city landscape. The synergy between the mentioned two fields usually transcends local, often national, and, in some cases, integrated project can be of international concern. One of the criteria for identifying such projects is certainly the firm commitment by the country concerned to implement the project (EC, 2005). Nevertheless, it is not only about the readiness of the authorities to tackle such issue – the identification of strategic projects depends on the extent of stakeholders' involvement and their cooperation. This is particularly relevant for the states without the tradition of cooperation among relevant stakeholders and with the non-transparent decision-making procedures (Peric, 2016a).

3 INTEGRATED SPATIAL AND TRANSPORT DEVELOPMENT ALONG EUROPEAN CORRIDORS

Before we proceed with an analysis of integrated spatial and transport development on the cased of two European corridors, it is important to clarify what is actually understood as a corridor. A corridor is a bundle of infrastructure and adjacent settlements and landscapes linking regions spread over a certain physical space (cf. Witte, 2014). From such a definition, it is clear that infrastructure development cannot be considered without taking into account the spatial dimension. Moreover, due to its axial nature, the issue of corridor development usually goes beyond the national borders (Scholl, 2016a). The main indicators assigned to the topic of corridor development are: 1) mode (road, rail and inland waterway), and 2) scope (freight and passenger) (Priemus and Zonnenveld, 2003).

Two main factors that determine the approach to be used when dealing with corridor development are its multidimensional and multi-scalar nature (Chapman et al., 2003). Multidimensional nature refers to various dimensions appropriate for further analysis, such as: 1) infrastructure (physical and organisational infrastructure), 2) space (functions and morphology), 3) governance (politics and institutions), and 4) economy (finance and market conditions). Although there can be difficulties in combining various aspects to gain the synergetic developmental effects, the improvement of its spatial and infrastructural dimension certainly have no negative impact on other two factors. When it comes to the multi-scalar nature of

corridors, it is logical to mention three main levels of observation: 1) transnational, 2) national/regional, and 3) local.

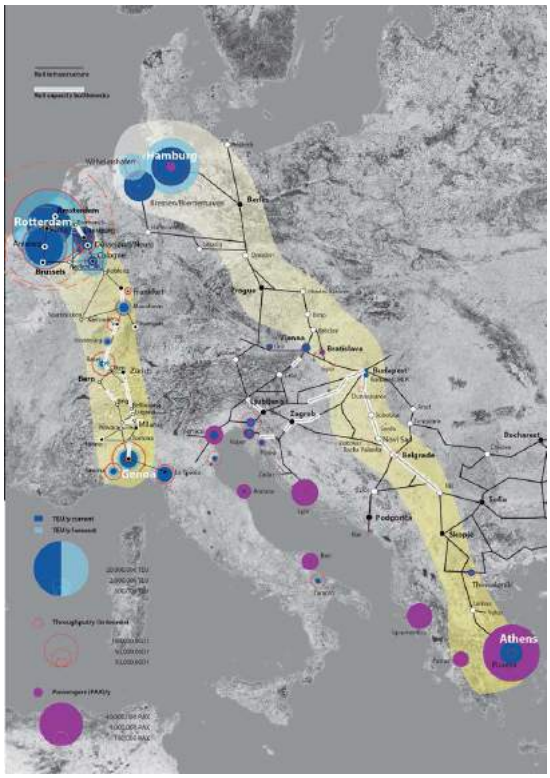

Figure 2 – Rail and port infrastructure along two European corridors (Source: Scholl, 2016b)

In the following lines, the main features of the Rhine-Alpine (Rotterdam-Genoa) and the Orient/east-Med (Hamburg-Athens) corridors (Figure 2) are to be elucidated, being observed from various levels according to the cooperative approach described in the previous section.

3.1 THE RHINE-ALPINE CORRIDOR

The corridor from Rotterdam/Antwerp to Genoa, which was designated as Corridor 24 by the EU TEN-T policy, now operates under the name Rhine-Alpine corridor as one of nine core European corridors. In its length of more than 1200 km, it travels through European regions that have the highest economic value – from the large North Sea harbours in Belgium and the Netherlands, across Germany and Switzerland, to the prospering economic centres of northern Italy, as well as the Italian Mediterranean area. In terms of transport, 700 million tonnes of freight are transported along this north-south link, while 70 million people, roughly nearly a fifth of the entire population of the EU, live in the catchment area of this important European north-south connection (Drewello and Scholl, 2016).

The corridor demonstrates which connections and conflicts between spatial and transport development at the macro-regional scale are to be observed and how the tasks to be solved can be identified and solved in steps. More precisely, the analysis provided below stems from the project entitled CODE 24, conducted in the period 2010-2013 within the framework of the European Commission supported INTERREG programme. Results and interim project results are reported in detail in other publications (see Scholl, 2011, 2012, 2014).

3.1.1 GLOBAL TRENDS

A strong increase in transport in the north-south direction of Europe can be expected for 2030 as globalisation continues to grow. The world is changing slowly but steadily into one single large market. In particular, the economic growth in Asia and the increase of goods exchange within the EU plays a vital

role. The Mediterranean Sea has taken over from the Atlantic as the main shipping route for maritime exchange. In the long term, it will be important to take the opportunity to use the port potential situated on the Mediterranean and the Adriatic coasts in order to achieve a balanced European goods exchange. Highly productive hinterland connections, in particular, those on railway systems, as are the northwest European ports, will as before play a decisive role (Scholl, 2016a). At present, the main parties dealing with sea transport in Europe are the ZARA ports (Zeebrugge, Antwerp, Rotterdam, Amsterdam) and the German harbours of Willemshafen, Hamburg, and Bremen/Bremerhaven.

3.1.2 TRANSNATIONAL OVERVIEW

Antwerp and Rotterdam alone had a turnover in 2010 of over 16 million TEU (Twenty-foot Equivalent Unit). By 2020, a redoubling of capacities to over 36 million TEU is expected. Such a preference for northern harbours over the Mediterranean ports is indicated by the financial capacities of these regions and the much larger and more effective cargo handling facilities as well as better hinterland connections, e.g. waterways, railways, and high capacity roads. The container capacities of Rotterdam are five times larger than those of the Ligurian harbours (Savona, Genoa, and La Spezia) together. The harbours in Northern Europe, particularly in Rotterdam, have invested massively in the extension of their harbour infrastructures. Rotterdam will increase its cargo handling capacity with a harbour extension 'Maasvlakte' from about 450 million tonnes at present to about 700 million tonnes in 2035. However, the harbour extension will make it increasingly difficult to guarantee a smooth hinterland transport (Günther, 2015). In the Netherlands, the launch of the Betuwe line was achieved in 2007 under considerable pressure. Starting in 2015, a full use of this line between Oberhausen and Emmerich will mean the need for a third track and block concentration which will not be available because the German railway network has other priorities. From now on, commissioning and costs of around 2 billion euro will be expected for the year 2023 (Scholl, 2016a).

3.1.3 NATIONAL CHALLENGES

With such a foreseen port development and their extra capacity, more bottlenecks are to be expected. Today, there is a great request from the Rotterdam port to transfer the share of the container hinterland traffic (4 million TEU in 2009, and 18 million TEU expected in 2035) to the waterways and railways.

Another bottleneck is the strategic railway section Frankfurt-Mannheim in Germany. It is highly significant for the approach to the Brenner Tunnel and the Main East-West Railway, as well as the missing continuation of the four-track extension of the Rhine line from Offenburg to the area south of Freiburg. It should be mentioned that despite all financial difficulties, the 17.6 km long Katzenberg Tunnel was launched in time for the time table change in December 2012. The building work for the Raststatter Tunnel could also begin in 2013 after a nearly ten-year postponement due to missing financial support. The launch is now expected to be in 2022, with construction costs of around 700 million euro. According to prognoses, the finalisation of the extension of the Rhine Valley route will not take place until after 2030, although according to the contract, a timely launch with the Gotthard Base Tunnel had been secured (Scholl, 2016b).

In addition, the opportunity arises, supported by new planning approaches, to achieve the separation between goods transport and passenger transport in some densely populated areas, for instance, by using goods transport bypasses. Route sections where this should definitely be tested are: Germany – the section between Frankfurt and Mannheim, from Offenburg to just south of Freiburg, and Switerland – Basel to Central Switzerland, a bypass for Bellinzona, and south of Ceneri to the Italian border. Transferring dangerous goods transport not only decreases railway noise and eliminates unsatisfactory noise reduction installations, it also plays a significant role in creating relevant planning considerations (Tosoni, 2015). This transfer would also create additional experimentation space for local and regional development where smaller distances to the railways are possible (Scholl, 2016a). It will be necessary therefore to create sensible priorities, together with the national and regional authorities, and find integrated solutions through innovative forms of cooperation. This can only happen on the basis of an assessment of the entire situation. CODE 24 has created an important foundation for these (Scholl, 2012, 2014, 2016a).

3.1.4 LOCAL ISSUES

Eliminating bottlenecks is of major significance for the redevelopment of cities and regions, whereas the catchment areas of the railway stations are considered the crucial redevelopment nodes (Peric, 2016b; Scholl, 2016a). This encourages the need to keep, or actually improve the availability of public transport. With redevelopment, the share of public transport's part of overall traffic can be increased when relevant attractive offers for public transport are available. Its decrease or reduction through increasing goods traffic, which would compete with the passenger transport on rails, is counterproductive. Of all these reasons, the integrated development in the triangle of passenger transport, goods transport and redevelopment is of central importance (Scholl, 2014).

The catchment areas of nearly all mayor railway stations offer special opportunities for redevelopment. The city of Frankfurt is a good example: near the central railway station and several metro stations, a new city area, the Europaviertel, is being created on a 100 ha-site where about thirty thousands of people will have the unique opportunity to modernise and expand the Messe Frankfurt in its inner city location.

Estimates of the available settlement potential along the north-south axis show a grand total of around 150,ooo ha. Some of these potential areas, e.g. in the German state of Rheinlandpfalz, in the regions of Rhein-Neckar and Upper Rhine-Bodensee, and in the Swiss cantons of Basel-Landschaft, Schwyz, Uri and Tessin. A conservative estimate would mean that around 50% of the sites would be available immediately. Applying an average gross floor ratio of about 0.5 would, and filling the area with apartments at a rate of 50 m2 of floor space/inhabitant, around 7 million additional inhabitants could be housed along the corridor (Scholl, 2016a,b). These are significant figures for a potential settlement area, which can be actively implemented in the coming decades.

3.2 THE ORIENT/EAST-MED CORRIDOR

The Hamburg-Athens corridor, defined as the Corridor 22 in the TEN-T policy and as the Orient/east-Med(iterranean) corridor within the more recent EU Core Network programme is one of the key north-south transport corridors in Europe. In its length of more than 2,500 km, it connects the ports of northern Germany with the Adriatic and the Danube ports, as well as the seaports in Thessaloniki and Athens. Hence, by strengthening its transportation features, the Hamburg-Athens corridor is considered an axis with a huge potential for triggering off spatial development, which would finally lead to territorial cohesion in Europe (Scholl et al., 2016).

However, the Hamburg-Athens corridor is currently an example of genuine shortcomings in various domains: it runs through the states with traditionally low economic performances in comparison with the developed Western European countries; there is also a significant lack of efficient infrastructural network – seen in numerous missing links and bottlenecks; the corridor nowadays coincides with the so-called migrants' route; finally, administrative obstacles caused by mistrust among stakeholders are common practice in cross-border issues, as well as among various authorities of the nation states (Peric and Scholl, 2017).

The findings presented below stem from the ongoing three-year project titled "Spatial and Transport Development in European Corridors: Example Corridor 22, Hamburg-Athens", being conducted currently by the German Academy for Spatial Research and Planning (ARL). Since the ARL members recognised the necessity to take also the needs and challenges of the non-EU states affected by the official corridor into consideration, and since the route from Budapest to Thessaloniki via Belgrade is the shortest (400 km) and the most logical way of connecting the north and south of Europe, the axis covered by the ARL project slightly differ from the official EU route – it runs through Serbia as a primary line, while the way through Romania and Bulgaria is of secondary importance.

3.2.1 GLOBAL TRENDS

Since the development of the large-scale projects is affected by global factors (trade, economy, demography), it is important to stress the relevance of the Hamburg-Athens corridor in trans-continental circumstances. Firstly, 80% of global TEU traffic appears between Europe and Asia, reaching the most important European ports of Rotterdam, in the north, and Piraeus, in the south. Secondly, the New Silk

Route is constantly upgrading through the Chinese investments, mainly through constructing the new high-speed railway network not only in Asia, but also in Europe. Its most important section in Europe is a route from Athens to Budapest via Belgrade. Finally, until 2050, the population rate in Europe will shrink to only 5.7% of global population (in comparison to 10.1% today), with a constant loss of people in Eastern Europe, mainly due to socio-economic reasons and, hence, the huge brain drain (Scholl et al., 2016). Hence, demographic decline in Europe together with boosting factors in terms of trade and economy actually trigger us to think about sustainable ways of overcoming such challenges.

3.2.2 TRANSNATIONAL OVERVIEW

Improving the conditions along the Hamburg-Athens corridor can be seen as contributing to a better territorial cohesion along this axis and reducing the gaps between Western and Eastern Europe. Nevertheless, the challenges are numerous. In terms of economy, the countries along the corridor have 21% lower performance comparing to Western Europe. Although EU provided a great support (also in financial terms) to the less developed European regions, the problems and limitations that the socialist countries had to face during the period of the Cold War are still felt nowadays. Through the lens of the traffic analysis (goods export/import, passengers/goods on rail/road, network density), the performance is even 50% lower looking at the section from Vienna towards the south. This makes a great inconsistence in the railway schedules, thus practically disabling any efficient passenger and/or freight transfer along the corridor; e.g. the passenger travel time from Hamburg to Athens is 52 hours (Scholl et al., 2016). Finally, in terms of population along the corridor, there is 128.4 million inhabitants counting only NUTS-1 regions along the corridor route and excluding these in Germany and Tirol in Austria (Scholl, 2016b). Such a limited population potential creates ond of the biggest challenges for the creation of an effective rail conncetion. However, recent incentives in various projects (transport infrastructure, pipelines, etc.) provide an important stimulus for the research on possibilities for raising the competitiveness level of the Hamburg-Athens corridor.

3.2.3 NATIONAL CHALLENGES

In addition to the historical differences between the countries on the corridor route (i.e. only Germany, Austria and Greece were not part of the Soviet bloc), there is also a high discrepancy between the corridor member states today. Except Germany, which is still one of the leading European countries in economical terms, Greece is faced with recent economic downturn, Romania and Bulgaria are dealing with numerous problems despite their joining to the EU, while Serbia still tries to fulfill all the necessary pre-accession conditions.

In terms of transportation quality indicators, the current assessment is as follows. There is an asymmetry in the freight distribution through the maritime transportation mode. Sea freight is mainly concentrated in the northern ports of Hamburg and Bremerhaven, while maritime passenger figures are low in Germany. In contrast to this, both in the Greek and the Adriatic ports, the main flows using ports are the passengers, denoting a much more tourist-oriented economy than in the north. Secondly, the rate of freight transport is the highest in Austria, while particularly low rate (in both freight and passenger transport) is observed in the case of Greece. Finally, the quality and density of the rail network is better in the regions northern from Vienna – escpecially in Germany. In contrast to this, there are no railway lines with a speed more than 160 km/h along the southern part of the corridor. In some of the regions (parts of Serbia and Bulgaria), the train speed is only 40 km/h (Scholl et al., 2016).

3.2.4 LOCAL ISSUES

The local scale of the Hamburg-Athens corridor project relates to identifying the hot spots – places with major spatial implications of transport infrastructure development. Moreover, it is interesting to observe some ‘good-practice’ examples of integrated spatial and infrastructure development as well as more challenging case studies. The result is directed towards mutual learning finally aimed at improving the collaboration among various stakeholders with different interests.

The main differences are again observed between the cities along the northern part of the corridor and the hot spots in the south. The 'best practice' examples of integrated spatial and transport development are found in the cities of Hamburg, Berlin and Vienna. Each city succeeded to make certain transportation Mutual engagement of all interested parties in the problem screening and identifying the complex points for future actions.

- Preparation of regional conferences and the annual project conferences, whereby the results and findings are introduced to the public, representatives of all governmental levels and political committees, as well.
- The findings, together with the outcome from the debates with the public and political representatives, should consolidate a common strategy for the corridor development.
- The European Grouping for Territorial Cooperation (EGTC) is considered one of the follow-up aims, as it will continue to be the organisational body for future project related activities.

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ID 1467 | MOBICAMPUS-UDL: COMBING WEB-BASED TRAVEL SURVEY AND SMARTPHONE APP DATA COLLECTION TO UNDERSTAND AND MANAGE URBAN MOBILITY BEHAVIOUR

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ABSTRACT: Reducing car dependence in general and driving alone in particular has become an important public policy issue. Universities are recognised as special generators in transportation planning processes. Large university campuses contribute in a variety of ways to the travel demand. However, university populations are underrepresented in travel behaviour studies in particular regular household travel surveys. The aim of MobiCampus-UdL research is to understand Lyon's university communities daily travel behaviour characteristics not just from a travel demand modelling perspective but as well to help campuses managers in planning coherent measures prioritising various range of mobility management strategies/urban design solutions appropriate to the diverse mobility needs and fulfil sustainability goals. The data used specifically was generated by an online travel survey conducted among several higher-