DOES INTEGRATION WORK FOR CORRIDOR DEVELOPMENT?

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This paper[i] aims to clarify the added value of an integrated perspective on corridor development in Europe. For many years, knowledge on corridors has been developed in a sectoral, technocratic manner, despite a growing call for an integrated analysis of corridor issues. The integration argument is however lacking specific knowledge on different problem areas. The question therefore remains to what extent an integrated analysis would be beneficial to resolve persistent corridor issues such as the existence of bottlenecks. This paper is sensitive to the multi-dimensional nature of corridors and explores the extent to which certain problem areas of corridors (in particular the economic and transport dimension) contribute to an integrated analysis of corridor issues at different spatial scales. It will be examined whether the added value of the integration argument is provable and whether this leads to a restating of the importance of corridors for present-day European policy objectives.

1. Introduction

The recent inception of the *Connecting Europe Facility* by the European Commission (2011) has triggered the evolution of yet another definition of corridor routes and programmes. This time, nine transnational corridors have been defined, which are together called Europe's Core Network Corridors (European Commission, 2013). Such corridor programmes have for years been driven to a large extent by ambitions regarding the integration of different scales and dimensions involved in corridor development. The topic of interest in this paper therefore is the question of to what extent an integrated perspective on corridor development can be proven to be of added value for European policy makers in their current and future governance strategies regarding European corridor development.

For over a decade now, European corridors are receiving ongoing attention from policy-makers and academics alike. First, this can be observed from the considerable number of European policy programmes with regard to corridor routes, programmes and definitions (European Commission, 1999; 2008). Second, the attention to European corridors can be observed from the academic literature. The attempts at introducing corridor development into the academic debate as a promising spatial concept to integrate different kinds of objectives resulting from different sectors and scales of policy-making is of relevance in this respect. This is reflected, among others, in the work of Priemus and Zonneveld (2003), Albrechts and Coppens (2003), Chapman *et al.* (2003), Romein *et al.* (2003), Schönharting *et al.* (2003) and De Vries and Priemus (2003) on the governance of corridors. Corridors and corridor development thus can be regarded as potentially important concepts for spatial policy-making on different levels of scale, able to deal with the challenging and complex spatial reality presented to Europe's urban regions nowadays.

However, despite this abundant attention, the corridor concept thus far seems not to have been sufficiently or rightly addressed in policy, practice and academia (Witte, 2014). First, many policy programmes still have a limited scope in the sense that they merely take into account one-dimensional, transport-oriented issues related to logistics and transport operations. Second, many of the issues in the practice of corridor development have not been solved yet and remain relevant (especially the persistence of bottlenecks along corridors), regardless of the fact that most of these issues and

bottlenecks have already been known for over a decade since their initial introduction. Finally, a fragmentation in the academic debate is observed regarding the availability of knowledge, institutions and governance structures fit to efficiently address present-day issues in European corridors.

As a result, knowledge on corridors has been developed in a sectoral manner for many years, despite a growing call for an integrated analysis of corridor issues. In other words, a discrepancy is observed between the call in policy-making as well as in the academic debate for an integrated approach towards the development of European transport corridors, and the often isolated, local and sectoral-based practices of corridor development. This disparity raises the question of to what extent striving for an integrated approach to corridor development is the right way forward, both in policy and in the academic debate on European transport corridors. This paper will address this question.

The paper will be organised as follows. Section 2 elaborates on the definition and issues of corridors and corridor development in Europe. Also, the integration debate is put to the fore. Section 3 provides arguments refuting the benefits of integration for corridor development, whereas Section 4 does the exact opposite, thus highlighting the added value of an integrated perspective on European transport corridor development. Section 5 balances the pro's and contra's regarding the integration argument in corridor development. Section 6 discusses the potential of corridors as a useful concept in spatial planning and sketches some prospects for future corridor studies on the European transport network.

2. Corridors and corridor development in Europe

In 2013, it was ten years since the *Journal of Transport Geography* published a Special Issue on the governance of corridors (which was edited by Priemus & Zonneveld, 2003). This section will take the findings from this Special Issue as a starting point to outline the definition and issues of corridors and corridor development in Europe. By doing so, the integration debate which was mentioned before will also be introduced in greater detail. This sets the scene for discussing the pro's and contra's of the integration argument in corridor development in the remainder of this paper.

2.1 What are corridors?

Essentially, corridors can be viewed as narrow bundles of infrastructure which are connecting two or more urban regions dispersed over a certain physical space (Figure 1). These bundles usually exist in three modes: motorways, railway links and inland navigation or short sea connections. One can also include ICT infrastructure such as power lines, cables and oil pipes to arrive at a broader definition of a corridor. In general, however, corridors concern connections that use one or more of the three previously mentioned modes (road, rail and inland waterway) and include both passenger and freight transport (Priemus & Zonneveld, 2003). For years, however, the corridor concept has been considered from a broader point of view, which is exemplified by greater attention to the various scales at which corridors operate, and the various (sectoral) dimensions which seem to be integrated in corridor development (Chapman *et al.*, 2003; Priemus & Zonneveld, 2003; Romein *et al.*, 2003; Schönharting *et al.*, 2003; De Vries & Priemus, 2003).

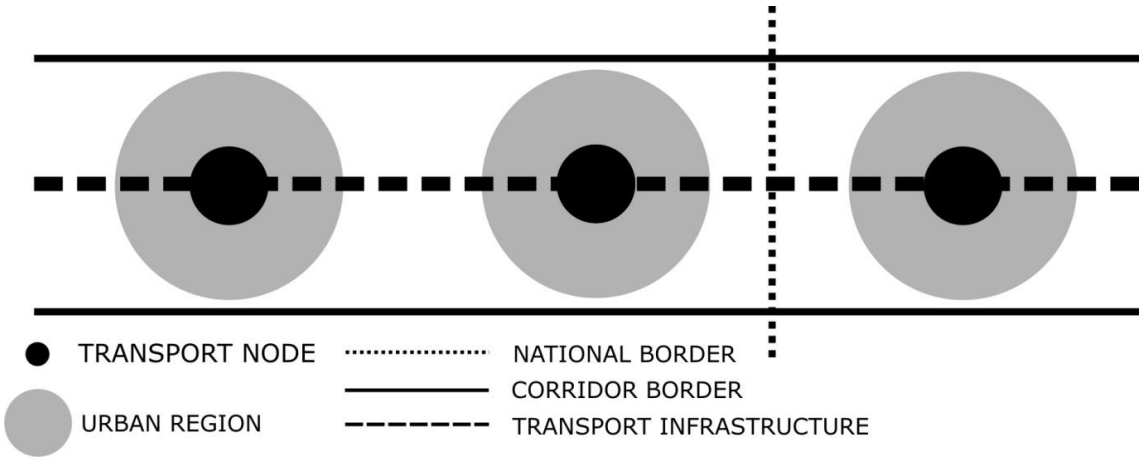

Figure 1. Transport corridor conceptualisation (Witte, 2014)

It is thus stressed that corridors occur at many spatial scales, ranging from tramway corridors in urban regions to high-speed intercity rail corridors and freight corridors at the global level (Pain, 2011). Other examples of corridors are 'necklace-of-pearl' corridors for channelling smart growth at the local to regional level or corridors from production areas to port areas. Moreover, corridors are perceived as a structuring concept for infrastructure development (Bruinsma *et al.*, 1997) and urban development plans (Banister *et al.*, 1995), as a network structure in freight and passenger transportation (Hesse & Rodrigue, 2004; Woxenius, 2007), as a policy concept in the European cohesion discourse (Peters, 2003; Dühr *et al.*, 2007) or as a vehicle to trigger economic development (European Commission, 1999; 2011). According to Rodrigue (2004), corridors can be viewed as the place where transport, economic and demographic processes are linearly articulated. In summary, the corridor concept strives to integrate policies on infrastructure, urbanisation and economic development (Priemus & Zonneveld, 2003). The crucial factor is the multi-dimensional and multi-scalar nature of present-day corridors. In this sense, the concept refers to corridors not only as infrastructure axes, but also as economic development and urbanisation axes (Priemus, 2001; Pain, 2011).

On basis of the foregoing, it can be stated that a definition of corridors should not only be concerned with the different scopes (freight and passenger) and modes (road, rail and inland waterway) involved in corridor development, and that the different scales (local, regional and [trans-]national) and dimensions (transport, spatial, institutional and economic) are also of relevance (Table 1). This understanding is largely in line with the corridor conceptualisation by Chapman *et al.* (2003). Corridors thus are perceived to incorporate multi-modal infrastructure connections that serve both freight and passenger transportation, operate on multiple scales and impact multiple dimensions. In other words, present-day corridor development is concerned with a complex interrelatedness between transport capacity, economic benefits and spatial structures. This paper is especially interested in the variety of scales and dimensions involved in corridor development, because knowledge is lacking on many of these scales and dimensions. Moreover, these are the levels to which many of the present-day issues in corridor development can be related. In particular, the focus of this paper will be at the economic and transport dimension of corridor development.

Table 1. Characteristics of the corridor concept (Witte, 2014)

Level	*Aspects*
Scope	- Freight - Passenger
Mode	- Road - Rail - Inland waterways
Scale	- Local - Regional - National - Transnational
Dimension	- Transport - Spatial - Institutional - Economic

2.2 What are (still) the issues?

Numerous issues can be found in literature and practice regarding corridor development in Europe, mostly related to difficulties in achieving the wished-for successful transnational spatial governance in European corridors. For example, a common remark is on the lack of institutional involvement in the management of corridors. Although there is no great support among stakeholders for a governmental authority for complete corridors, the need to coordinate central government policies with local land use and transport policy at the corridor level is felt (Chapman *et al.*, 2003). Chapman *et al.* (2003) also point to a strategic conceptual choice to be made between developing corridors in general, and developing at dense, nodal points. In addition, the key issues for corridors are poor transnational connectivity; conflicts between long-distance and short-distance traffic; the inability to manage infrastructure congestion; competitive pressures and inequalities between regions; environmental impacts of increasing demands for transport and development; development patterns increasing the need to travel; and institutional discontinuities and a lack of coordination in decision-making.

As can be observed, the majority of issues in corridor development are related to either the multi-scalar or the multi-dimensional nature of corridors. Zooming in on the multi-scalar, multi-dimensional nature of corridors, Albrechts and Coppens (2003) argue that corridors have become trapped between the global and the local scale. In this way, European policy for efficient transportation and communication systems intertwines with local policy aimed at quality of life and the environment. This is related to the argument presented by Bertolini and Spit (1998) on node development and Scholl (2012) on corridor development: while the direct costs of node development are likely to remain at the lowest spatial level, its benefits tend to spread over a wider area. Therefore, the aims of economic development and transport improvement on an interregional level must be accompanied by the aims of environmental protection and social integration on a local to regional scale. To this end, advance is favoured in governance structures able to support the integration of different kinds of objectives resulting from different sectors and scales of policy-making (Priemus & Zonneveld, 2004).

2.3 Integrated corridor development in Europe?

What is becoming evident from this brief overview of the corridor concept and its major issues is that a call for a more holistic approach to corridor development is desired to adequately address the variety of issues. It should be noted, however, that the call for integration is not at all new and stems from the traditional debate in spatial planning on the self-evident efficiency of sector-based planning versus the

sector-transcendent benefits of integrated planning (e.g. Spit, 1998). When this debate is related to European corridor development, the spatial impacts of transport infrastructure and the positioning of corridors within these spatial and transport dimensions are of interest. In other words, the spatial dimensions of the growing transport sector and the implications of corridor development for European policy strategies are of relevance. As seen from this perspective, it is remarkable to note that either way planning has thus far largely failed to produce a systematic approach to deal with corridor issues (Witte *et al.*, 2013a; Witte, 2014).

On basis of the characteristics mentioned before corridors can be seen as integrating both multiple dimensions (i.e. transport, spatial, institutional and economic) and multiple spatial scales (i.e. local, regional and [trans-]national). As many of the present-day issues in corridor development can be related to this multi-scalar, multi-dimensional nature of corridors, it has been put forward that a more holistic approach to corridor development is desired to adequately address the variety of issues. However, given the sectoral-based practices and the fragmented nature of the available knowledge, it can be argued that there is up to now little research available that in a satisfactory way has evaluated the added value of an integrated perspective on corridor development to solve the remaining corridor issues. As the empirical support for corridors and integration is limited, analyses of the potentials of and challenges for corridor development at different scales and across different dimensions is desired (Witte, 2014). This paper therefore reports on the findings of two problem areas of integrated corridor development which are of interest in this respect: the (limited) potential for integrated corridor development stemming from the economic dimension (Witte *et al.*, 2013b) and the challenges for integrated corridor development stemming from the transport dimension (Witte *et al.*, 2012; 2014).

3. Why integration doesn't work: evidence from the economic dimension

This section addresses the supposed added value of integrated corridor development in achieving regional economic growth. Witte *et al.* (2013b) have focused their attention on the question of whether corridors have a special function in regional economic growth due to agglomeration advantages, and whether corridors can consequently be seen as a useful planning instrument to help connecting urban regions into large-scale development zones across Europe. The starting point was the often-heard assumption in policy documents that corridor development contributes to regional economic growth (e.g. European Commission, 1999; 2011), in contrast to the notion that the impact of corridors on regional economic development lacks substantial empirical support.

Corridors have been absent in the agglomeration debate, although corridors link larger urban agglomerations and may facilitate larger markets and knowledge spill-overs (McCann & Shefer, 2004; Frenken *et al.*, 2007; Thissen *et al.*, 2013). The publication of Witte *et al.* (2013b) has contributed to this hypothesis by means of an empirical analysis of the economic potential of corridors, and the added value of the corridor concept for explanations of regional economic growth in terms of positive externalities and spill-overs. In this paper, their main findings will be highlighted. The main problem to be addressed is whether corridors may operate as independent economic clusters (Bathelt, 2005), thus showing functional (specialisation- or diversity-based) clustering, as opposed to merely reflecting co-located agglomeration advantages of connected large urban regions (Louter, 1999).

The foremost conclusion to be drawn based on the empirical material is that there is little empirical support for a corridor effect on productivity and employment growth externalities. In other words, the results seriously question the provability of the added value of corridors for growth and agglomeration. However, general relations between agglomeration economies and regional economic growth have been found that are in line with accepted insights from New Economic Geography theorising (compare for example Frenken *et al.*, 2007; Dogaru *et al.*, 2011).

At least five problems regarding the supposed contribution of corridors (i.e. independent clustering effect) to achieving regional economic growth have been found. First, corridor regions cannot be distinguished from non-corridor regions in terms of spatial-economic determinants of productivity growth without incorporating the urban dimension in the same analysis. Second, whereas diverging specialisation effects between core and peripheral regions were observed, corridors are not the driving force of this effect. Third, non-corridor regions are more conducive to employment growth than corridor regions. Fourth, employment growth is especially dependent on urban contexts, and corridors appear to hamper this relation more than they foster it. Finally, both the urban dimension and the European core-periphery dimension dominate over the corridor dimension in determining the decisive coefficients of much of the modelling (Witte *et al.*, 2013b).

Thus it can be concluded that the outcomes show significant spatial heterogeneity when applying varying conceptions of space to the relationship between agglomeration economies and growth differentials in Europe. Remarkably, there is little support for the special function of corridors in economic growth due to agglomeration advantages; although the magnitude and direction of agglomeration effects generally are as expected, the findings either are not systematically stronger inside corridors than outside them, or are not a result of a genuine corridor effect altogether. The limited corridor effect was already confirmed on a local to regional scale by Bruinsma *et al.* (1997), Louter *et al.* (1999) and Van Oort and Raspe (2005), but now also has empirical validity on the European regional scale. Still, the scale problem is a recurring issue in measuring agglomeration effects (Frenken *et al.*, 2007) and deserves further elaboration. Other specific measurement issues such as the cut-off points of certain spatial regimes (of corridors and the size of cities) and robustness analyses of time- and sector-varying dynamics should be considered in future research.

The findings have important implications for European policy objectives regarding corridor development and regional economic growth, because the variety that has been shown is little recognised in EU policy. Since a Europe in which regions develop at different rates has been observed, the remark of Puga (2002) that governments have no clear indication of which way to push when seeking efficiency still holds. The results of Witte *et al.* (2013b) show a highly varied picture of corridor effects with tight conditions: what is beneficial in some corridors and urban regions is not necessarily beneficial in other regions, even when the same conditions apply. In other words, the type of agglomeration economies in combination with the structure of the economy matters for prospects of structural economic growth in regions. This confirms the recently suggested need for a place-based approach in regional development policy in Europe (complementary to a generic, people-based approach) that takes into account these regional differences and requirements, so that each region has its own specific approach to economic development (Barca *et al.*, 2012).

In conclusion, the empirical support for the economic potential of corridors and resulting positive externalities are not strong, and the added value of the corridor concept in explaining the spatial heterogeneity of structural growth patterns is not proven. However, whereas the empirical evidence presented in this section is in contrast to the positive stance towards the relatedness between space, economy and transport in relation to corridors as was initially put forward in Witte *et al.* (2013a) – thus by doing so refuting the integration argument in corridor development, this does not imply that the corridor concept therefore is irrelevant. This provides the outlook for the next section on the possible benefits of the transport dimension to integrated corridor development in Europe.

4. Why integration works: evidence from the transport dimension

In contrast to Section 3 this section highlights evidence that supports the integration argument in corridor development, by zooming in on findings from the transport dimension of integrated corridor development (Section 2.3). Witte *et al.* (2014) have addressed – following the implications of Witte *et al.* (2012) – the heightened need for empirical support regarding the supposed multi-dimensional nature of issues in global freight transportation and corridor development. Within Europe, the port and inland navigation network can be seen as the backbone on which these global freight transportation issues take physical shape. Especially when considering the 'weakest link' principle, the functioning of inland ports is of importance for the overall efficiency of corridors. For years, however, the port system development literature (e.g. Hesse & Rodrigue, 2004; Rodrigue, 2004; Notteboom & Rodrigue, 2005) has shown a strong focus on the maritime context within a network-based perspective (Outside–In). In contrast, it is argued that inland ports are growing in complexity and importance, and that port system development literature should also be sensitive to the independent role and structure of inland ports in transportation networks and corridors (Inside–Out). Thus, the attention should focus more on the challenges that possibly exist within the context of inland ports, and the ways in which these challenges are influencing the independent role of inland ports and the shaping of inland ports' governance strategies.

The results of Witte *et al.* (2014) have both theoretical and practical implications, which will be discussed in greater detail in this paper. With regard to the theoretical implications, two major consequences arising from the growth in cargo volumes and the expanding of distribution facilities both in the seaports and in the hinterland can be observed, which are reflected in the theoretical models (e.g. Notteboom & Rodrigue, 2005; Wilmsmeier *et al.*, 2011; Monios & Wilmsmeier, 2012). These are the increasing importance of inland ports as cornerstones of inland accessibility (i.e. port regionalisation), and the increasing extent to which seaport areas are facing port-city challenges (Wiegmans & Louw, 2011; Daamen & Vries, 2013). However, on basis of the 'weakest link' principle and the directional development debate (Outside–In/Inside–Out), Witte *et al.* (2014) show that two problems emerge. First, in the port regionalisation concept insufficient attention is paid to the independent role of inland ports (i.e. Inside–Out). Second, there is hardly any consideration of the possibility that port-city challenges may also arise between inland ports and cities within transnational corridors. Witte *et al.* (2014) thus have contributed to the ongoing discussion in literature a next step in port system development, that is, the emergence of inland port-city challenges.

With regard to the practical implications, an empirical analysis of inland ports' development strategies has been performed (Witte *et al.*, 2014), using an institutional methodological approach which is in accordance with the recent 'institutionalist turn' observable in port literature (e.g. Daamen & Vries, 2013). This research approach opens up possibilities to shed more light on the exact nature of the challenges emerging in the context of inland ports (Inside–Out). The results can also be seen as an empirical follow-up to the analytical framework (Figure 2) which was presented in Witte *et al.* (2012), because the framework has been tested systematically, using both deductive and inductive types of analysis. The most important conclusions to be drawn are related to the multi-dimensional nature of the inland port-city challenges on the one hand, and the ways in which these challenges are shaping inland ports' governance strategies on the other.

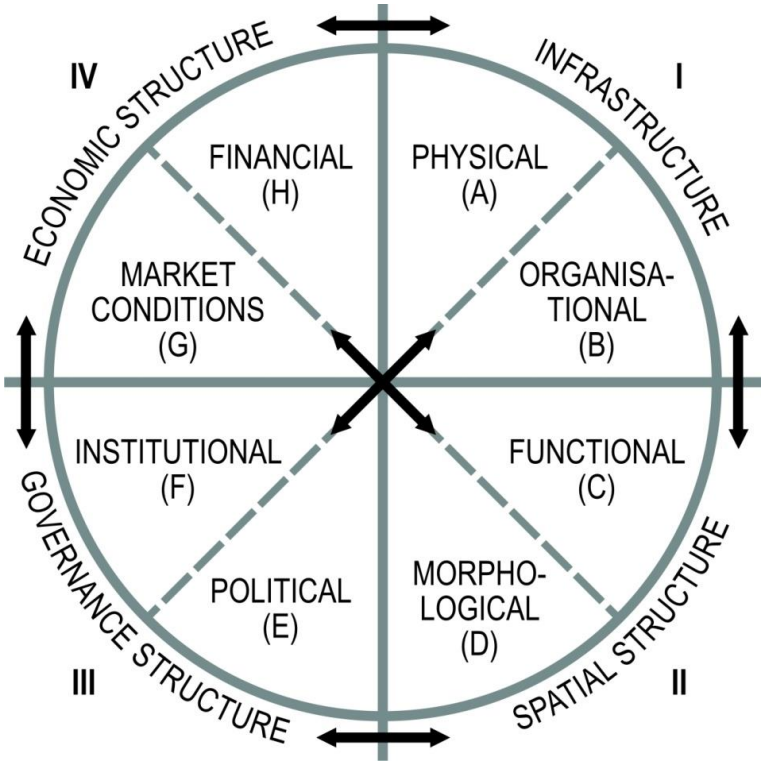

Figure 2. Analytical framework for bottlenecks in the European transport network (Witte, 2014)

One of the conclusions is that all dimensions of the analytical framework (Figure 2) have been found in practice. This highlights that the framework is of added value in identifying the multi-dimensional nature of inland port-city challenges and the ways in which these are related to one another. Next, it is shown that challenges arise when these dimensions tend to overlap (in particular, industrial and distribution functions versus residential, leisure and nature functions). Although the challenges between inland ports and cities that have been identified all take a specific form, a commonality has been found in the unbalance regarding the supra-regional benefits and local to regional negative externalities of inland ports. This probably results from difficulties in the trade-off between land-use functions in plan-making (e.g. the conflicting functions of water, or the problematic relation between infrastructure and spatial structure). A better consideration of the governance dimension of the analytical framework might help to ease such conflicts between transport and land use.

This closely relates to another conclusion: several governance strategies have been observed which inland ports use in dealing with the emergence of inland port-city challenges. It is found that a pro-active and positive stance towards zoning contributes to efficiently accommodating mutually exclusive dimensions of inland port development. An interesting finding in this respect is the importance of institutions and the dominance that the institutional dimension can have over other dimensions. This can either be positive, thus contributing to the efficiency of inland ports, or negative, thus hampering the further development of inland ports. This finding is in line with the stated importance of institutional forces and the implications for the prioritisation of certain issues or dimensions, as was mentioned in Witte *et al.* (2012). In other words, the willingness or reluctance of actors and institutions to interfere in inland port development might either stimulate or hamper the overall efficiency of inland ports and transport corridors. The implications of these findings for the integration debate in corridor development will be discussed in the next section.

5. Integrated corridor development reconsidered

In this paper, the question has been put forward whether an integrated conceptualisation of corridor development has added value for European policy makers in their current and future governance practices regarding corridors and corridor development in Europe. This paper has examined whether the added value of the integration argument is provable and whether this leads to a restating of the importance of corridors for present-day European policy objectives, in particular by reviewing evidence from two problem areas of integrated corridor development, that is the economic dimension and the transport dimension. The remainder of this section outlines the arguments pro and contra integration. This can be considered a stepping stone towards the reflection in the final section.

A first notion regarding this paper's contribution to the integration debate is that the findings in principle are uniform, but that they are also contradictory in the sense that some evidence that supports the integration argument is provided (Section 4), and other evidence is provided that refutes the integration argument (Section 3). In other words, it is shown that integrated corridor development is inconsistent within itself, which affects the problem-solving capacity of the corridor concept. Thus, when this is related to the integrated versus sectoral-based discussion (Section 2), a definite answer cannot be provided regarding, for instance, the opportunities of an integrated corridor authority, relative to the efficiency of local and sectoral-based solutions for corridor issues. However, some indications can be given regarding the dimensions and scales on which integrated corridor development is or is not of added value for corridor governance practices.

The arguments that plead for the integration argument in corridor development can be extracted from the transport dimension (Section 4). First, from Witte *et al.* (2012) it was concluded that many policy documents are insensitive towards the multi-dimensional nature of bottlenecks, while the theoretical and empirical evidence presented in that chapter clearly pointed at the inevitable interrelatedness of the multiple dimensions of bottlenecks. Moreover, Witte *et al.* (2014) provided additional empirical support for this analytical framework of cumulative bottlenecks by showcasing the multi-dimensional nature of challenges existing between inland ports and cities along corridors. This has proven the added value of the multi-dimensional framework for the integration argument in corridor development. Finally, it should be noted that these publications share a commonality in the sense that the relevance of the integration argument is especially emerging from the traditional, transport-oriented starting point of both papers. In other words, integration 'works' when the initial situation is dominated by a sectoral transport-oriented perspective.

The other side of the integration debate is formed by evidence that is pleading against the existence of any added value in integrated corridor development (Section 3). The findings presented in Witte *et al.* (2013b), in particular, have made clear that the initial support for the integration argument in Section 2 should be refuted, since the empirical evidence consistently invalidated the importance of corridors for growth and agglomeration. A clustering effect in corridor regions is observable, but the corridor itself cannot be considered exclusively responsible for this. Thus, viewed from the economic dimension, the added value of the integration argument is not proven.

This implies that the added value of the integration argument in corridor development at least is not uncontested. This reinforces the conclusion from Witte *et al.* (2013a) that the sectoral-based practices of corridor development in Europe are not really surprising but are rather very realistic, especially in the light of the recent economic downturn. The overall conclusion concerning the integration argument in corridor development therefore is that the contribution of an integrated approach to efficient corridor development is certainly not self-evident, but is not irrelevant either. The findings are not conclusive in supporting either side of the integration argument. However, in general this paper

has contributed to nuancing the debate regarding corridors and integration. It is shown that, although the empirical evidence in some cases is contradicting the integration argument in corridor development (Section 3), corridors can still be seen as useful linkages between regions sharing a commonality in their respective issues (Section 4).

6. Prospects for (integrated?) European corridor development

The integrated versus sectoral-based perspective debate in European corridor development (Witte, 2014) has been at the heart of this paper. In this final section, some reflections will be made regarding the contribution of the integration argument to the positioning of corridors in European policy, and the implications of transnational corridor development for multi-level governance strategies. It can be concluded that the contribution of the integration argument to the positioning of corridors within European policy can be regarded as limited. In terms of economic development (Section 3), the added value of integration is hard to prove. On the other hand, integration poses promising common ground for regions sharing a commonality in their respective transportation issues (Section 4). For instance, inland ports in the Dutch-German border region might find a commonality in dealing with trans-border water management issues along the river Rhine. This is a topic for future study.

Nevertheless, one could question whether the corridor concept is a proper reflection of the spatial reality and whether corridors as a spatial phenomenon can be legitimised (Witte *et al.*, 2013a). What could be really interesting in this respect is a consideration of the 'why' question. The findings have not yet provided enough insight in the reasons *why* the corridor concept has difficulties in becoming a mainstream and accepted spatial concept (compare Pain, 2011). Is it because of conceptual ambiguity with regard to the multi-dimensional nature of corridors? Is it because of the transnational scale at which corridors usually operate? Is it because of institutional fragmentation? These questions could be the starting point for future research into the contributions of the corridor concept to achieving European policy objectives. In particular, the findings might contribute to the formulation of new corridor studies under the umbrella of the Connecting Europe Facility and the tender which is ongoing for studies on the Core Network Corridors, following the revision of the TEN-T guidelines.

A practical consideration is what implications transnational corridor development can have for multi-level governance strategies (for example, in an EGTC/European Grouping of Territorial Cooperation). What does the possible added value of transnational corridors mean for policy and practice on the national, regional and local levels? Witte (2014) has put to the fore the relation with positive and negative externalities and the importance of public–private constellations in this respect. In Section 4 it was argued that many challenges in corridor development in the end reflect imbalance regarding the supra-regional benefits on the one side and local to regional negative externalities on the other. This is an important outcome that should be considered in policy-making for corridors on different spatial scales. An interesting point for future research concerns the 'break-even point' where positive externalities turn into diseconomies. With respect to the public–private constellations that are of importance in corridors, future research could focus on the contribution of corridors in avoiding the unplanned extension of urban areas, on the question of whether corridors can manage without public interference, or even whether the governance of corridors is needed at all (compare for instance Schönharting *et al.*, 2003; Chapman *et al.*, 2003). This question could be an intriguing new way to view European corridor development from a co-evolutionary perspective.

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[i] This paper is based on research carried out in the context of my doctoral thesis (Witte, 2014). Overlap between this paper and my doctoral thesis (in particular Chapter 1 and Chapter 7 of the thesis) is deliberate and intended. Rather, this paper should be viewed as a summary and outlook on the most important findings of the doctoral thesis and the related research papers.