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Accessibility and connectivity – Movement between cities, as a critical factor to achieve success on cross-border cooperation (CBC) projects. A European analysis

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ABSTRACT

Nowadays, cross-border cooperation (CBC) is an undeniable reality in the space encompassed between European borders. This contributes to economical and social sustainable development, as well as to cohesion for trans boundary areas, which include administrative and territorial units from neighboring countries.

A correct conceptual basis for the methodological approach to connectivity lies in the fact that the development of transportation systems, as integrated networks at different scales, is deeply changing their operation and the way they induce urban and regional development patterns. Overloaded transport corridors in the context of changing transportation flows are becoming an important issue for accessibility, impacting CBC indirectly, but harshly.

Different modes of transport create different patterns of accessibility, with different influence in CBC accordingly. Throughout the present research, CBC European case studies, where connectivity-movement between cities, has been identified as a key factor for their territorial success, were assessed, described and analyzed.

In the period of 2001–2006, improvements and further imbalances have occurred in accessibility development across regions and modes. Some signs indicate that the core-periphery pattern is slowly changing which leads towards an upgrade on the accessibility of places, regions and cities.

1. Introduction

CBC Projects and Strategies are seen as pivotal for the territorial cohesion, not only in Europe, but also all over the World (Task Force on the United States-Mexico Border, 2009; Lee and Na, 2010; Fadigas, 2010; Fadigas, 2015; Batista, Cabezas, Fernández, & Pinto-Gomes, 2013; Castanho, Loures, Cabezas, & Fernández-Pozo, 2017).

Conversely, the European Project, given the recent developments, as example the deviation of United Kingdom from EU (Brexit), among many others events that occurred within the EU in the last few years, shows the gaps that still exist on this process (Holmes, 2016; Dale, 2016).

However, many CBC Projects, between EU boundaries, also demonstrate an example of the success of cross-border cooperation (LISER, 2015). Based on newer studies and researches (see: Castanho, Loures, Fernández, & Pozo, 2016; Nicolini & Pinto, 2013; Vulevic, 2013; Vulevic & Dordevic, 2014; Boehnke, Rippl, & Fuss, 2015; Domínguez, Noronha Vaz, & Vaz, 2015; Castro & Varela Alvarez, 2015; Kurowska-Pysz, 2016; among many others), critical factors for territorial success have already been identified. One of the most significant factors, according to researchers, planners, and decision makers, regarding CBC Projects is the promotion of connectivity and accessibility-movement between cities.

Due to the relevance of this specific factor, the present research, through the analysis of European CBC Projects, aims, on a more thoroughly way, to define how accessibility and connectivity influences their success.

According to ESPON (2009): "Accessibility plays a significant role in European policy discussions related to the development of regions and cities as well as the European territory as such. In several European

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policy documents over the last decade, latest in the European Commission Green Paper on Territorial Cohesion and in the Territorial Agenda of the EU involving all EU Member States, accessibility is seen as a key factor in improving the territorial balance in Europe and the attractiveness of the Members States, their regions, and cities. The newest European facts and evidence on trends in accessibility presented are providing an update on European accessibility patterns for the information of policy makers in regions and cities as well as on national and European level."

Based on the above-mentioned report put forward by ESPON (2009) It leads that: "to be able to support Europe playing a significant economic role in the World, European accessibility will have to satisfy a greater demand for transport of goods and people from European regions and cities".

Ever since CBC projects started growing, infrastructures and transportation were pivotal for CBC project success. Good accessibility and connectivity are critical preconditions to foster competitiveness on a European and global scale. Adequate internal and external paths, as a territorial indicator of transportation infrastructures, can strengthen the economical cohesion in a CBC area (Brown et al., 2010; Pain, 2010; Pain, 2011; Van Hamme & Pion 2012).

To analyze the potential of the previous and actual accessibility indicators on European case studies, regarding their accessibility and connectivity on CBC areas, the paper will evaluate, assess and compare the accessibility and connectivity levels of those areas.

The study also aims to formulate hypotheses for answering questions, such as:

- Which trends in regional accessibility have been the most important over the last decade in European analysis?
- Which regions in those CBC projects are in a most favorable position related to accessibility and regarding the different modes of transportation?

2. Accessibility, similar CBC projects and strategies

There are several definitions and concepts for accessibility. The concept was born in 1950 and is very useful in different fields (e.g., transport planning, urban and regional planning) and has acquired a variety of meanings over the years. Therefore, there is no single approved definition, and it may be argued that accessibility is an elusive concept, one of those common terms that everyone uses until the problem of its definition and measurement arises (Gould, 1969). However, all definitions of accessibility seek to give a measure of the separation of human activities or settlements that are connected through a transport system (Sherman, Barber, & Kondo, 1974). For this reason, the most used definition is: "accessibility indicators describe the location of an area with respect to opportunities, activities or assets existing in other areas and in the area itself, where 'area' may be a region, a city or a corridor" Biehl, (1991).

Accessibility measures become indicators through the use of mathematical terms. Accessibility indicators can differ in complexity. Their mathematical formulation is variable; therefore, their classification carried out by different authors is extensive (Morris, Dumble, & Wigan, 1979; Wegener, Schürmann, & Spiekermann, 2000; Baradaran & Ramjerdi, 2001; Geurs and Ritsema, 2001; Curtis & Scheurer, 2010). Moreover, in transport infrastructure planning, the analysis of territorial cohesion through these indicators is a recurrent theme in the research (Mérenne-Schoumaker, 2008; Bellet, Alonso Logroño, & Casellas, 2010) because it explains the interrelationships among human activities (Brocard, 2009). These indicators always include in their formulation a spatial impedance term that describes the ease of reaching other destinations. Accordingly, accessibility plays an important role in the European Observation Network, Territorial Development and Cohesion (ESPON, 2006)[i], which provides a wide range of indicators that describe the transportation system and their spatial implications and indicators accessibility.

The European regional policy has been directed towards the different regions' territorial cohesion since the Treaty of Maastricht in 1992, and for this purpose, it is essential that the socioeconomic structures of the different spaces benefit from the development of the new infrastructures. The adopted transport policies pay particular attention to territorial cohesion through different models of use and development (Frank et al., 2014; Martí-Henneberg, 2013).

Over the last decades, a growing number of accessibility models, studies and projects addressing Europe-wide accessibility have been developed, such as: ESPON TRACC; ESPON Transport Services and Networks; ESPON Territorial Impacts of EU Transport and TEN Policies; ULISSES; OTALEX-C; among many other projects. As well a large amount of researches and studies about transport accessibility have been produced (Bruinsma & Rietveld, 1998; Schürman, Spiekermann & Wegener 1997; Gutiérrez, 2001; López, Gutiérrez & Gómez, 2008; Chi, 2012; van den Heuvel et al., 2014; Palmateer, Owen, & Levinson, 2016; Castanho, Loures, Cabezas, & Fernández-Pozo, 2017; among many others). Accessibility indicators are used by planners to assess spatial effects of their proposals, and to identify the areas requiring actions to ensure minimum conditions for service. They are also used in the decision making procedure of new infrastructure projects or improvement of the existing infrastructure. Improvements in the accessibility of regions and places, currently underperforming, may provide cohesion and support to achieve a better balanced territory on a regional, national and/or European scale. Those improvements should also help to release potential territories, which are currently underused, aiming to benefit the European competitiveness. In this regard, the latest trends in European potential accessibility become important for policy makers at the area (ESPON Trends in Accessibility, 2013). It is assumed that regional accessibility is related with economic and social opportunities (Naranjo, 2016).

According to the Organization for economic cooperation and development (OCDE) report 1998–2000, two ways are critical to classify regions by their location in Europe, by their accessibility:

- Rank them by a decreasing accessibility order and define a suitable number of classes, from central (i.e. high accessible) to remote – central-peripheral dichotomy.
- Take their economic performance into account. Economic experts suggest that regions that have better access to raw materials, suppliers and markets are *ceteris paribus* – economically more successful than regions in remote/peripheral locations. As transport infrastructure is an important policy tool to promote regional economic development, it is highly policy-relevant to know which regions have been able to take advantage of their location and which regions have not (Vulevic, 2016). According to OCDE, generally the more accessible regions are also the most economically successful.

Back in 2006, ESPON has developed a study that compares the potential multimodal accessibility of regions with the GDP *per capita,* aiming to mapping those results.

Based on empirical and modelling analyses put forward by ESPON TRACC and previous ESPON projects, the impacts of changes in accessibility, competitiveness, cohesion and sustainability, leads to an increase on accessibility is a precondition for economic development (Gutiérrez, Naranjo, Jaraíz, & Ruiz, 2015). The accessibility modelling for the seven TRACC TRansport ACCessibility at regional/local scale and patterns in Europe case study regions selected: West Mediterranean in Spain and France, Northern Italy, Bavaria in Germany, Czech Republic, Poland, Baltic States and Finland; in ESPON TRACC was done with a rather strict definition of the accessibility indicators and a subsequent research program.

ULYSSES (Using applied research results from ESPON as a yardstick for cross-border spatial development planning) is an experimental and