

Topical collection on accessibility and policy making

Ana Condeço-Melhorado¹ · Karst T. Geurs²

Published online: 6 June 2017

© The Author(s) 2017. This article is an open access publication

Modern societies face important transport related challenges that menace their economic performance and quality of life. Among these challenges, congestion is a major problem in many cities around the world, generating economic losses and negative environmental impacts such as noise and pollution, which negatively affects the life and health of their citizens.

Provision of transport alternatives is a top goal of many transport planners. However, the available transport options are not always at the disposal of all social groups, which raises questions on the equitability and affordability of transport means.

These challenges require the integration of different policies that consider the complexity of direct and indirect impacts of transport systems. The concept of accessibility, as a measure of the relative nearness or proximity of one place and persons to all other places or persons, can help to integrate transport and urban/spatial planning actions. Accessibility incorporates implicit conditions such as closeness, availability of transport options and diversity of activities that might be of interest for society. Although many different definitions and measures for the concept of accessibility exist in the literature [1, 2, 5], accessibility instruments are typically considered useful instruments for the planning practice [3]. This Topical Collection on Accessibility and Policy Making presents a

collection of five studies that apply accessibility measures to analyse transport and land use policies. Table 1 shows an overview of these studies, focusing on their relevance for policy making.

Geurs, La Paix and Van Weperen show how bicycle and train integration policies can increase the ridership and job accessibility in the Netherlands. Based on a stated choice survey, the authors evaluate different scenarios related with cycling infrastructure (routes, parking facilities around train stations) security and safety issues and comfort and quality of facilities around train stations. These bicycle and train integration actions were evaluated based on ridership and accessibility analysis, in order to show the most effective policies and compare the impacts between rail station categories.

Also regarding the rail mode, this time at the European level, Rotoli, Navajas Cawood and Christidis, use accessibility measures to determine the impacts of different operational enhancement scenarios. Three different scenarios were tested, considering changing speeds in different rail link categories. Authors use four accessibility indicators, representing cost and attraction attributes of locations and construct composite accessibility indicators by means of Data Envelopment Analysis and Benefit of Doubts approaches. The outcomes of this study are a good example of the usefulness of accessibility analysis on the prioritization of investment needs.

Congestion is a major problem regarding the road mode, especially around metropolitan areas, it negatively decrease accessibility due to the increase of transport cost. Congestion is also a dynamic phenomenon as its negative effects vary along the day, the season and across space. Nowadays new sources are available to study the complexities of congestion, enabling analysis that are spatially and temporally more detailed. The paper from Moya-Gómez and García-

This article is part of the Topical Collection on Accessibility and Policy Making

✉ Karst T. Geurs
k.t.geurs@utwente.nl

¹ University Complutense of Madrid, Madrid, Spain

² University of Twente, Enschede, The Netherlands

Table 1 Characterisation of papers in this topical collection

Authors	Policy interest	Accessibility goals	Policy level	Transport mode	Activities	Accessibility indicator
K. Geurs L. La Paix, S. van Weperen	Bicycle –train integration policies	Increase ridership and job accessibility	National (Netherlands)	Bicycle and rail	Jobs	Potential accessibility measure
F. Rotoli, E. Navajas Cawood, P. Christidis	Efficiency of rail infrastructure	Maximise accessibility to activities and minimise transport costs	European	Rail	Population	Weighted travel time, network efficiency indicator, potential accessibility indicator, daily accessibility indicator
B. Moya-Gómez, J.C. García-Palomares	Congestion	Dynamic congestion impacts on accessibility levels	Metropolitan (Madrid and Barcelona)	Roads	Population	Potential accessibility measure; average weighted impedance
C. Jacobs Crisioni, F. Batista e Silva, C. Lavalle, C. Baranzelli, A. Barbosa, C. Perpiña Castillo	Investments in the road network and land-use policies	Compare the impacts of transport and land use policies	European and local	Road	Population	Potential accessibility measure
A. Condeço-Melhorado, J.L. Zofio, P.Christidis	Investments in the road network and demographic change	Impacts of network change and demographic change in accessibility levels	National (Spain)	Road	Population	Potential accessibility measure

Palomares show the impact of congestion, measured for Madrid and Barcelona. They use TomTom data on Historical Speed Profiles and incorporate these into different accessibility measures. Accessibility is analysed considering dynamic scenarios for every 15 min between 2011 and 2012. Different congestion patterns between both cities were obtained with the dynamic and detailed accessibility measures provided in this study. The outcomes constitute an interesting tool for better planning of transport and land use activities and to improve the resilience of cities towards congestion.

Accessibility indicators are able to show the impacts of changing conditions in the transport system (supply side) as well as in the transport demand side. Both effects are evaluated in this Topical Collection by Jacobs-Crisioni, Batista e Silva, Lavalle, Baranzelli, Barbosa and Perpiña Castillo. These authors explore the effects of future population changes (simulated by the LUISA land-use model) and transport investments in accessibility. Different scenarios are compared, including the current situation, a scenario that isolate the effects of transport infrastructure changes and two scenarios that analyse the joint effects of population and road investment changes. The authors recall the importance of considering the interaction between transport and population trends, when using accessibility indicators for planning practice. Their study shows that accessibility levels depend substantially on population change. On the other hand, population trends have a drastic impact on the spatial distribution of benefits generated by transport infrastructure investments.

The combined effect of transport infrastructure investment and population change in accessibility levels is also the focus of the last paper of this topical collection, authored by Condeço-Melhorado, Zofio and Christidis. This study uses historical data on road infrastructure and population (1960–2010) in Spain, to represent the transport and land-use component of accessibility. Authors use Index Number Theory to measure the individual contribution of road expansion and population change. While the ultimate objective of transport investment is to increase accessibility, the authors show that population changes had an even greater impact in accessibility levels.

The studies presented in this topical collection show the contribution of accessibility analysis for the planning practice of transport and land-use policies and offers some examples of innovations within this research area. The papers in this topical collection, however, have not addressed its contribution to the actual planning practice, and potential barriers towards the use of the accessibility instruments. Findings from a European COST Action that brought together a large network of more than 100 accessibility researchers and 80 practitioners, from 22 countries, suggest that mainly organizational barriers and lack of institutionalization of accessibility instruments, are the main causes of the lack of implementation of accessibility instruments in the planning practice [4]. A important direction for future research thus seems to be to examine how organisational and institutional barriers towards the use of different accessibility instruments have been or can be overcome in actual planning practices.

Open Access This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

References

1. Geurs KT, van Wee B (2004) Accessibility evaluation of land-use and transport strategies: review and research directions. *J Transp Geogr*. doi:[10.1016/j.jtrangeo.2003.10.005](https://doi.org/10.1016/j.jtrangeo.2003.10.005)
2. Handy SL, Niemeier DA (1997) Measuring accessibility: an exploration of issues and alternatives
3. Papa E, te Brömmelstroet M, Silva C, Hull A (2016) Accessibility instruments for planning practice: a review of European experiences. *J Transp Land Use*. doi:[10.5198/jtu.2015.585](https://doi.org/10.5198/jtu.2015.585)
4. Silva C, Bertolini L, te Brömmelstroet M, Milakis D, Papa E (2017) Accessibility instruments in planning practice: bridging the implementation gap. *Transp Policy* 53:135–145
5. te Brömmelstroet M, Curtis C, Larsson A, Milakis D (2016) Strengths and weaknesses of accessibility instruments in planning practice: technological rules based on experiential workshops. *Eur Plan Stud*. doi:[10.1080/09654313.2015.1135231](https://doi.org/10.1080/09654313.2015.1135231)