Urban Design Qualities Promoting a Sustainable Transportation Mode – Walking

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Introduction

Urban settings that support walking are a prerequisite for sustainable cities and for successful public transport. The role of the built urban environment in supporting people’s health and well-being by facilitating physically active behaviour and sustainable travel has attracted international attention by the WHO, the UN and the IPCC. Research aimed at identifying features of the built environment supportive of walking has rarely focused on European contexts characterised by heterogeneous built environments, compact structures, shorter average trip distances, and a higher proportion of active transportation.

The multidisciplinary research project ‘Urban Walking’ aimed to describe urban physical features, transport system characteristics and urban design qualities that encourage or hinder walking for a whole trip or as a part of a trip chain in the Swedish context. A second aim was to discuss new urban design strategies for promoting walking as a mode of transport. The project integrated expertise in environmental psychology, transport planning and architecture, and the project team jointly developed overarching research questions analysing walking as a mode of transport in relation to the design of semi-central urban environments.

Method

A mixed-method approach was used. A literature review served to identify and explore scientific papers on walking from the fields of architecture, urban design, health sciences, transport planning and environmental psychology. A postal questionnaire was sent to residents in three neighbourhoods in the city of Malmö, Sweden (N=1001, corresponding to a response rate of 30%). The postal questionnaire was complemented with a web survey (N=110), and GIS analysis of walking routes reported in the questionnaire (649 routes). A sub-sample of residents were invited to structured walks and group discussions in their neighbourhoods (N=106). The collected information was subjected to quantitative and qualitative analyses.
The empirical studies were concentrated to three neighbourhoods with common macro-characteristics (distance to city centre, availability of public transport, car ownership and socio-demographics), but differing planning ideals and street network characteristics. Lorensborg represents early modern superblocks with surrounding large green areas and segregated street network. Dammfri is dominated by early modern blocks and a semi-integrated street network. Rönnehholm consists of closed grid blocks surrounding a neighbourhood park. The street network is integrated and there are commercial premises at street level.

A three-day collaborative ‘Walkshop’ was launched to communicate research results to students on the Masters course, Sustainable Urban Design, and thereby directly transfer research outcomes to possible design solutions that would support walking in the city of Malmö.

**Results**

A meta-language for a relational approach to walking was developed with a notion of the walker as a socio-technical assemblage. We identified objects of passage, the individual’s appraisal process, interseriality, and boundary objects as key elements in the understanding of walking primarily initiated to reach a pre-defined destination or for everyday activities. Urban design can serve to form objects of passage, i.e. physical objects or triggers that shape the experience of walking. A principal component analysis with varimax rotation of the questionnaire survey revealed that previously identified overarching environmental qualities associated with walking could largely be confirmed: pleasurability of the environment, traffic concerns, accessibility of destinations and feasibility of walking in time and space as well as everyday life. Ordinal regression analysis identified feasibility of everyday life as the most important factor in the frequency of walking trips.

We found that the three neighbourhoods differed in terms of walking, between routes chosen within the neighbourhoods, and in the residents’ intention to choose certain routes. In the analysis of GIS data, we used a Kernel Density estimator to create Utilisation Distributions of routes walked. The results indicate that differences between the three areas in terms of walking behaviour and perceived urban design quality can be related to the walkability attributes, urban morphology, structure and design.

If feasibility of walking has been established, we found through LISREL analysis of perceived neighbourhood qualities that urban residents’ walking patterns were associated with physical (density, aesthetic pleasantness, green areas) and social (sociability, discretion, security) qualities as well as socio-demographics. In these associations, place attachment and the affective experience of the environment played key roles.

When narrowing the analysis to the pleasurability of three specific routes, we identified perceived complexity and aesthetic quality, upkeep and order, and the presence of well-maintained greenery as important qualities. Multiple hierarchical regression analysis was used to predict residents’ intention to choose or avoid walking the route, and these perceived urban design qualities were fully mediated by the affective experience of the walk. The perceived design qualities and affective experience varied between and within the three routes. Group discussions confirmed the impact of design qualities and revealed differences between walking during the day and at night.
The Walkshop was a collaboration between researchers, teachers, students, the City of Malmö and the Swedish Transport Administration. The Walkshop started with presentations of methods and results from the research project; these developed into an interactive learning workshop with studio work and presentations of design solutions for the Western Harbour Area in Malmö. The Walkshop was appreciated for the close interaction between research, education and practice. Stakeholders found that students’ work provided a great source of inspiration, and individual elements in the solutions are likely to be implemented.

**Discussion**

This project provides a multidisciplinary perspective on associations between urban design and walking in residential areas, in a European context, and complements existing theory on pedestrian traffic safety. Neighbourhood urban morphology, structure and design, experienced as certain urban design qualities, pull or push the residents’ walking and route choice. Urban design of residential settings should be considered in the transformation towards sustainable cities. This knowledge can be interpreted and visualised by future architects via education in sustainable urban design.

Walking is a transformative process shaped by the individual’s direct contact with the surroundings. Further studies should focus on how the physical environment interacts with the individual in this process. This may improve understanding of the feasibility of walking in everyday life at an individual level. In contexts where walking is feasible, an important strategy to promote walking may be found in bridging unpleasant gaps on pedestrian routes by attending to the users’ perception of urban design qualities. Our intention is that the integration of our research will result in pedestrian environments being designed in a way that departs from situation-based and context-sensitive architectural and urban design practices.

Our results have been presented at several international conferences and in scientific papers. The latest updates are found at

http://mpe.arkitektur.lth.se/forskare/maria_johansson/urban-walking/