March 2006, Paper of the Month

Paper: The influences of the built environment and residential self-selection on pedestrian behaviour: evidence from Austin, TX.

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Source: Transportation (2006): 33, 1-20

Over the last ten years more than 100 studies about the association between the built environment and physical activity have been published in the transportation, urban planning and public health literature. While there are some differences in the approach taken in those papers, nearly all of them have one thing in common: apart from a handful of longitudinal studies most of them have a cross-sectional design. Therefore, the authors always emphasise that any associations between the physical environment and PA found might not necessarily be due to travel choice, but to residential location choice. Hence, it is often suggested to examine if, and to what extent, self-selection bias explains the relationship between the built environment and PA.

In their study Cao et al. (2006) wanted to provide evidence on two questions: (1) whether the association between the physical environment and pedestrian behaviour depends on the purpose of the walking trip, distinguishing between recreational (strolling) and utilitarian (trips to shops) purposes, and (2) if residential location choice plays a role in this association. The authors investigated the environment and walking trips in six neighbourhoods in Austin, Texas. They used perceived measures of the environment as well as objective assessment by employing GIS. Among the potentially influencing factors on choice of residential location (e.g. quality of schools, proximity to work) one question asked for the relative importance of having shops in walking distance. This item in the survey was used as an indicator of self-selection. Two separate models were used to identify the most influential factors on the frequency of strolling and the frequency of walking for utilitarian purposes.

The results showed that in all six areas the number of walking trips for recreation was higher than for utilitarian purposes. The self-selection variable was significantly associated with both strolling and, even more so, with walking to the store. However, perceived measures of shade and safety showed a stronger association with walking for leisure. Objectively measured features of the environment were not associated with strolling. In terms of utilitarian walking, the self-selection variable showed the strongest influence.

Furthermore, for trips to shops, pedestrian connections and perceived measures of stores, walk advantage and walk comfort were significantly related to walking for errands. Among the residential neighbourhood characteristics only distance to the nearest store and perception of traffic were significant (inverse relationship with frequency of trips). The authors write that in regards to utilitarian walking aspects of the destination outweigh features of the residential neighbourhood.

This paper is important because it is one of only a few that shed light on the self-selection bias issue. It managed to do this even in a cross-sectional study design by simply adding a question to the survey about preferences in choosing the residential location. Cao and colleagues showed that residential preference is an important factor for pedestrian behaviour. This would limit the potential of influencing pedestrian behaviour by changing the environment by those people who favour automobile oriented neighbourhoods. However, more than one quarter of the subjects in this study indicated that shops within walking distance were important in their residential choice. Also, Cao et al. showed that particularly perceived neighbourhood characteristics are strongly associated with strolling while features of local commercial areas are important in facilitating walking to shops. The authors of the study conclude that policies should promote more pedestrian-oriented developments to provide environments that facilitate walking. They also suggest that traffic calming measures are likely to have a positive influence as traffic was negatively associated with walking. For future research Cao and colleagues recommend transportation research about pedestrian behaviour to go beyond the derived demand paradigm which only considers walking to destinations, but not walking as an activity of itself and to collect separate data on walking for these two different purposes. Since strolling

trips were more prevalent than utilitarian trips, it raises the issue of the contribution of active transport to population levels of PA.