

Urban Form and Activity Patterns

Daniëlle Snellen

Eindhoven University of Technology, Urban Planning Group

P.O. box 513, 5600 MB Eindhoven, The Netherlands

Tel.: +31 40 2472301

Fax.: +31 40 2475882

E-mail.: d.m.e.g.w.snellen@bwk.tue.nl

Main theme of the PhD

In recent years national and local governments in the Netherlands have started the implementation of the so-called VINEX-policy in order to comply with the expected housing needs in the decades ahead. This means that vast building sites are being developed. In doing so far-reaching decisions are made on the spatial structure of these new neighbourhoods and districts and on the way in which they are embedded in the existing built environment. The consequences of these choices with regard to policy goals set by Dutch governments, like sustainability, reduction of (car)mobility, sufficient economic and social base for services, are not clear. Empirical underpinnings for chosen policies are only available for some aspects of the choices made. And where empirical evidence is lacking, choices are made based on 'common sense'.

The aim of this PhD-study is the development of an evaluation methodology that can be used to assess the effects of existing and new concepts for spatial structures on a large number of aspects, translated in evaluation criteria for policy goals. The knowledge gained in this way can be utilised to make better choices for locations and design of new development sites.

Research methodology

Theory behind the study is that new (or existing) urban areas form an environment for individuals and households to live in. Individuals and households have their basic needs and personal preferences, while the environment they live in poses them with opportunities and constraints. The fulfilment of the needs and preferences within the context of the urban environment results in activity participation of individuals and households. The activity participation leads to activity

patterns, which show not only what kind of activities are executed but also at which locations, using which transportation modes, at what times and with which frequency.

The information contained in the activity patterns is used in this research project to obtain scores on a number of performance criteria. These criteria have been developed in an earlier stage of the project, and are all based on the overall concept of sustainability. Within the concept of sustainability two main relevant dimensions are discerned, e.g. a social dimension and an ecological dimension. The social dimension is concerned with equity and meeting human needs, while the ecological dimension is concerned with prevention of consumption of unrenovable resources and production of harmful or wasteful emissions.

The performance criteria on the social dimension are based on the idea of livability and quality of the urban environment from a social point of view. We have defined the quality of the urban environment as 'the measure to which the environment offers opportunities to engage in *fixed-mandatory* activities under *favourable conditions*, to maximise *discretionary* activities (preferably under favourable conditions) and to minimise *flexible-mandatory* activities'. In an earlier paper [Snellen, 1997a] this has been worked out in further detail. The performance criteria on the ecological dimension focus mainly on the ecological consequences of activity participation in the form of (motorised) travel. These have been discussed in more detail in another paper [Snellen, 1997b]. The conceptual framework that can be derived from all of this is presented in figure 1.

In order to assess the performance of different urban concepts, data had to be collected. First an assessment of relevant aspects of the physical environment, e.g. urban form, transportation network types, location of services, etc., was made, based on existing literature. Then 19 neighbourhoods in 9 Dutch cities were selected representing a systematic variation on these variables. Socio-economic aspects were also taken into account when selecting neighbourhoods, assuring a wide range of socio-economic classes to be included in the data collection. Respondents were asked to report information on frequently made trips, like home-to-work-trips and shopping trips and to keep a two day activity-and-travel-diary. In total app. 600 respondents cooperated in the research.

Stage of research

At this point, data collection and data entry have been completed and a start has been made with data analyses. The first results from bivariate analyses of the data on frequent activities have been presented at last years European Transport Forum conference (PTRC) [Snellen et.al., 1998a] and the DutchTransportation Planning Research Colloquium [Snellen et.al., 1998b]. These analyses will be followed by more comprehensive multivariate analyses. I am also working on the first chapters of the thesis, reviewing existing literature on the subject.

Major obstacles

Major obstacle in the research project is the data collection. Collection of diary data on activities and travel is time consuming for both researcher and respondent and is very costly. Response figures are low, since many potential respondents we approached waived participation. Our budget did not allow personal visits to respondents and telephone interviewing was not an option in view of the amount and type of questions we wanted to ask. This left us with a paper-and-pencil questionnaire as our only option for data collection.

Preliminary results

The first results of the bivariate analysis give us the some indications on possible relationships between urban characteristics and travel patterns. In general there are some conclusions to be drawn from the preliminary results. First of all we notice that relationships appear to be not as strong as might be expected from the literature. It also became clear that assumptions derived from the literature, which often originates from other countries than the Netherlands, can not simply be translated to the situation in our country. For instance, from our analyses there are few indications that density has very much influence, while in the literature this is presented as one of the most important urban characteristics influencing travel patterns. However, several urban characteristics did prove to be related to travel patterns, e.g. transportation network type in the neighbourhood, availability of services and employment and location of the city within our country.

Another main conclusion is that it appears that when a city or neighbourhood differs considerably with regard to (elements of) urban structure, like in our study, it can have a substantial effect.

This implies that when drastic changes in our urban structures, and therefore in our urban planning and design, are made, significant differences in the performance of (new) neighbourhoods may be achieved. For all of this it is necessary to look at the data in more detail, which we are doing at the moment and hope to report on in the main conference.

References

Snellen, D., A. Borgers en H. Timmermans [1997a] Towards an Evaluation Methodology for Urban Concepts (social dimension). Paper presented at the 11th AESOP congress, May 1997, Nijmegen, the Netherlands.

Snellen, D., A. Borgers en H. Timmermans [1997b] Towards an Evaluation Methodology for Urban Concepts (ecological dimension). Paper presented at the 2e International Symposium on Urban Planning and Environment, March 1997, Groningen, the Netherlands.

Snellen, D., A. Borgers en H. Timmermans [1998a] The Relationship between Urban Form and Activity Patterns. Paper presented at the 26e PTRC conference (European Transport Forum), September 1998, Loughborough, United Kingdom.

Snellen, D., A. Borgers en H. Timmermans [1998b] De Relatie tussen Stedelijke Structuur en Verplaatsingspatronen: voorlopige conclusies uit een activiteitenonderzoek. Paper presented at the Dutch Transportation Planning Research Colloquium, November 1998, Amsterdam, the Netherlands.

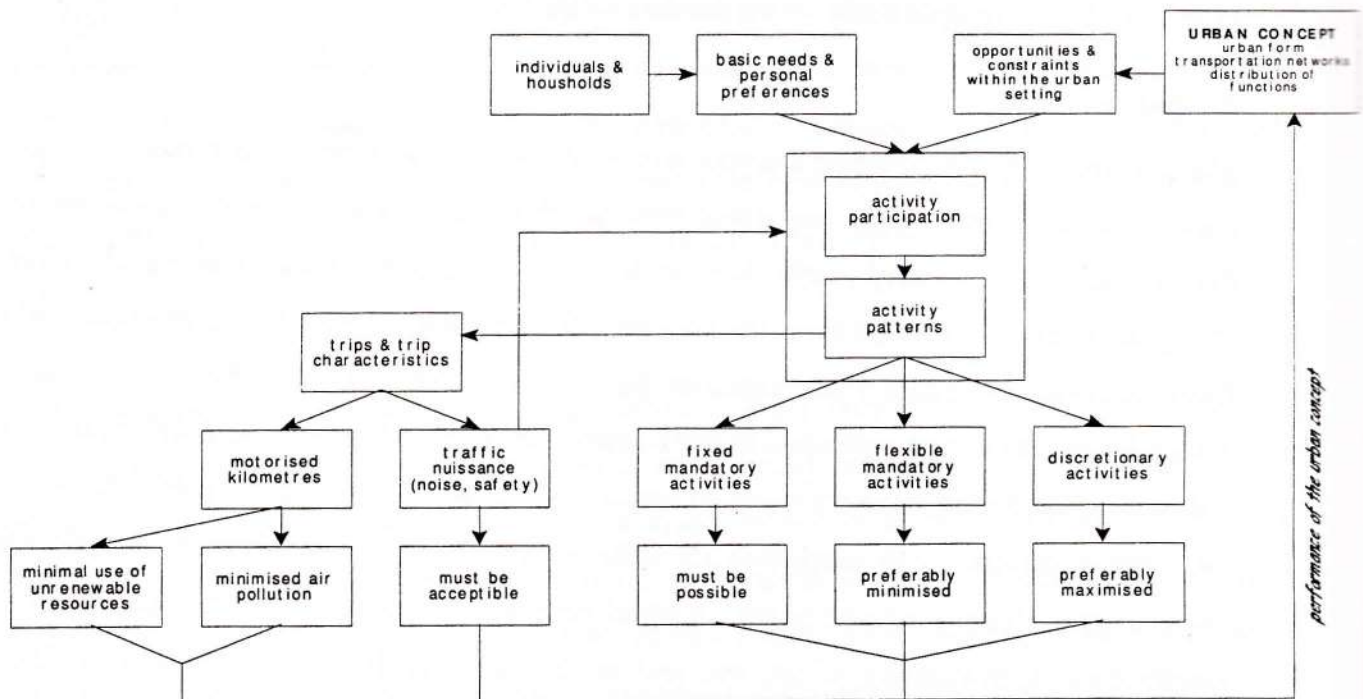


Figure 1. Conceptual framework