How ringroads change urban areas

On the relationship between planning, administrative and private activities, and their impact on urban territory.

Akkelies van Nes
Institute of Landscape Planning,NLH
P.Box. 5029, 1432 ÅS, NORWAY
Tel.:+47 64 94 83 77
Fax.:+47 64 94 83 90
E-mail.: akkelies.van.@ilp.nlh.no

The project's purpose and scope

Up to now the average age of a street was about 1000 years, while the usage of urban space is changing almost continuously. These changes affect in particularly a street's location, its capacity and its design. They influence the future physical structure of the street's immediate surroundings, i. e. its architectural form, the usage of land, the treatment of floor space, transformation processes in general and even the city's future form.

During the last 40 years the various functions of streets in Norway have changed considerably. Due to an increase in urban population and car traffic the transport capacity of the urban street system had to change. The new turn towards upgrading of the urban main road system in the mid 80s, particularly through constructions of tunnels, has emphasised the importance of urban transformation through development of the street network. New streets that are intended to account for the city's increasing traffic, influence the use of space in the vicinity of newly established roads. These changes in turn affect urban transformation, changes in floor space and the global development (the concept used as Hillier) of the future city area. It will be particularly interesting to investigate the changing neighbourhood along a new road, especially at points where it crosses other roads in the urban grid.

Hitherto research on how main traffic roads influence urban space use has concentrated primarily on social effects — like for example the effect of barriers. Questions about how the neighbourhood reacts to changes with regard to transformation of functions of architectural elements and urban functions have not been investigated yet. In these complicated issues, planners are usually divided into sectors of professional responsibility. The concern of the architects is the development of the city form while the engineers have been occupied with traffic flow and road capacity. There is a need to investigate the connection between urban space and transportation, and how the inputs from the two sectors of physical planning are influencing one another.

In the main, this investigation explores the interaction between an area's physical development and larger roadsproject. Likewise it will investigate how space is operating and how it is used in the vicinity of newly established ringroads or in the city areas they pass. In this respect structure, morphology and function of architectural space will be taken into consideration. The project is heading for a clear understanding of the interdependency between the usage of urban space, major road projects, and their further development.

Theory and research in the field up till now

There is a lack of theory and understanding about how changes in the traffic affects the use of space. The present knowledge is primarily a result of empirical studies that were carried out before and after major changes in a transportation system. Until now few investigations focussed directly on this topic. Falleth, Kollbotn and Tombre's study (1995) at NIBR comes closest to the present project. It concerned new bypass roads around small towns and villages in Norway. They investigated how roads of this sort affect the use of space in towns and villages and what kind of actors are dominating the development of this land use. On the basis of their we know more about how to build a transport system as a consequence of a change in space use (the concept used as Hillier), than about changes in space use as an result of newly established roads. Their results show that the private sector is dominating the development of new activities in the vicinity of newly established bypass roads, even though public organisations have a strong influence too.

The question as to whether ringroads in big cities influence space use has not been dealt with. Up till now research on this issue is lacking (Næss 1991).

Many cities are expanding spatially. This development alters the street grid, and, consequently, traffic flow, transport capacity and the function of single streets and their entire urban context. Until now, the form of Norwegian cities and their transformation through building activities and changes in the road net have scarcely been investigated. Only the physical effects of new roads have been taken into consideration, namely in so far as they help to create social barriers. This research-project has the following goals:

It should help to understand the interrelationship between space use and roads in cities. It should contribute to a more comprehensive understanding of how cities work and of transformations to which they are subjected. It should provide some insight into the possibility of investigating a theme in physical planning by alternative methods.

The requirement of impact assessment for new major road projects are increasing in Norway. This research-project is aiming at a better understanding of the impacts of building new roads in urban areas, which can support the weak understanding we have today about the connection between traffic, roads and the physical development of urban areas.

The flow and functionality aspect

The Space Syntax laboratory at UCL investigates the spatial functioning of cities. The Space Syntax method sees an entire city as an abstract configuration in space invested with a network structure of movement. All human activities are seen as an interplay between concrete elements and abstract relations. The latter ones are schemes or ideas we think with (non-discursive aspect of orientation), while the concrete elements are the ideas we think of (discursive aspect of orientation). In a sense the Space Syntax method tries to make the non-discursive discursive. It seeks to express the relational nature of urban space and form within a formal system of concepts and terms linked by some kind of algorithm.

The method sets out from a distinction between the local and the global systems in a city's structure. The global aspect concerns an area's relationship to a city as a whole, while the local aspect concerns the relationships within a neighbourhood. The research by Hillier and others (1984, 1996, 1998) shows that lively shopping streets are subjected to both a local and a global form of integration. The multiplier effect which results from them usually makes space use along shopping streets very successful. However, even rather small changes in an urban spatial structure can easily affect the entire configuration and the network movement that comes with it.

These considerations lead to one of the main hypotheses of my research project: By building a ringroad, one increases the number of global aspects in the grid of a ringroad's vicinity. Hence ringroads affect the space use in an entire city area.

The formal mass aspect

The method Realistic City-analysis is derived from Aldo Rossi's theory. It starts from the hypothesis that a city's architecture starts out from a logically definable system. The city is taken to be a manufact composed of various physical parts. Some of these constitute and determine the city's further development (primary elements). Moreover, the Realistic City-analysis is supposed to identify those areas of the city which are clearly structural, typologically and morphologically homogenous. All other urban areas are taken to be amorphus zones. Another important term is the degree of transformation an area can undergo. Accordingly, the second main hypothesis of this research project reads as follows:

A newly built ring road passes through different city areas (homogenous and amorphous zones). It will influence substantially the further development in areas with a high transformation degree, trough less influence on stabile and homogenous areas. The ring road will decide upon an area's further development if it is subject to an strong transformation process.

Methods

All those participating in the gradually changing use of urban space, leave traces of their activities in the communal record office (example: letters, maps, application etc.). In the first instance I want to investigate empirically changes in space use by comparing old documents, air photos and maptswith the present state and study the planning and decision procedure on the basis of such documents.

The main focus of this research project is to study the physical traces of all aforementioned activities in the city areas themselves — i.e. their structure, function, configuration and form as well the use of their space. On the one hand the project will approach the change in city areas in an empirical manner. Changes, which on the other hand affect a city's structure, function, configuration, form or the use of its space require a different approach. They will be investigated in a more formal way, namely with the help of both Hillier's Space Syntax and the Structural city analysis by C. O. Ellefsen (1996 a and b) and D. Tvilde (Their method draws on the theory on Aldo Rossis book The architecture of the City from 1983). The Space syntax touches upon questions as regards the inner logical connection, configuration and movement in a city (non-discursive questions), while the Realistic city analysis concerns the material mass of a city (discursive questions). Finally, the results of both these methods should be integrated with one another, and the according results should be compared with the results from the empirical investigation.

As for now the following exemplary cases will be taken into account: Ringroad 1 inclusive the Oslo tunnel in the centre of Oslo will be the main case study. The ringroad in the centre of Amsterdam, and maybe a ringroad in an English city/town (a decision about the third case will be taken during autumn 1999) will be supplyable case studies. Naturally, a major criterion for its choice will be the fact that is was built between 1960 – 1992. Good documentation in the communal record office is a decisive criterion for choosing an area as a case study.

Literature:

Ellefsen, Karl Otto og Tvilde, Dag (1990): **«Realistisk byanalyse»**, Arkitektavdelingen NTH, Trondheim.

Ellefsen, Karl Otto (1996a): *"Den urbane temaparken", Byggekunst nr. 6, 1996, s. 6-9.*

Ellefsen, Karl Otto (1996b): *"Styring av byutvikling", Byggekunst nr. 8, 1996, s. 14-15.*

Falleth, Kollbotn og Tombre (1995): *"Arealutvikling langs omkjøringsveier"*, NIBR rapport 1995:12, Oslo.

Flyvbjerg: (1991): *«Rasjonalitet og makt. Det konkrete videnskab»*, bind 1, akademisk forlag, Danmark.

Giere, Ronald (1991): *«Understanding Scientific Reasoning»*, 3rd edition, Fort Worth.

Hillier, B. and Hanson, J. (1984): *"The Social Logic of Space", Cambridge University Press, Cambridge.*

Hillier, B. (1996): *"Space is the machine: A configurational theory of architecture"*, Cambridge University Press, Cambridge.

Hillier, Penn, Banister and Xu (1998): *"Configurational modelling of urban movement network"*, Environment and planning B. Planning and Design 1998, volume 25, p. 59-84

Hillier, B. (1998):*"The Common Language of Space: a way of looking at the social, economic and environmental functioning of cities on a common basis"*, http://www.bartlett.ucl.ac.uk/spacesyntax/publications/commonlang.html, Space Syntax Laboratory, UCL, London

Rossi, A. (1982): *The architecture of the city*.

Troye, Sigurd V (1994): *«Teori og forskningsevaluering: Et kritisk realistisk perspektiv»*, Tano, Oslo