

HOW SPACE SYNTAX CAN BE APPLIED IN REGENERATING URBAN AREAS:

Applying macro and micro spatial analyses tools in strategic improvements of 8 Dutch neighbourhoods

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Abstract

This paper describes the tool Social Safe Urban Design (In Dutch: 'Sociaal Veilige Stedenbouw') as an example of how space syntax can be applied in regenerating urban areas and the challenges that need to be overcome. Local governments, building companies and other stakeholders often have different priorities and need to be convinced of the advantages of spatial interventions. To ensure that proposals are acceptable to decision makers, the space syntax jargon needs to be translated into a language understandable to stakeholders.

Key words: Space syntax in urban regeneration, network configuration, crime, communicative planning.

Theme: Architectural Design and Practice

Introduction

The past five years, several deprived neighbourhoods in The Netherlands have received special attention for improving their liveability, safety and socio-economic position. The main focus in the revitalisation of these 'priority neighbourhoods' has been on improving the social and economic position of the inhabitants, the quality of the built environment and formal surveillance. As far as the built environment is concerned, the emphasis has been primarily on the physical properties of the neighbourhoods, while the spatial properties have been largely overlooked.

In this context, the project Social Safe Urban Design (SSUD) was conducted. This project resulted in a new tool for the (re)vitalization of new and existing residential neighbourhoods. The basis of this tool lies in a national survey, which was carried out in 43 neighbourhoods and eight local pilots where the approach was further refined and applied. In the Dutch municipalities of Alkmaar, Deventer, Eindhoven, Maastricht and Utrecht consultancy projects were carried out in which the researchers and local stakeholders worked together to draft recommendations and interventions that may improve the liveability, safety and economic potential of the pilot areas. This paper presents the SSUD project as an example of how space syntax can be applied in consultancy practices. How do we make space syntax understandable and acceptable to the laymen and what challenges do we need to overcome to translate scientific knowledge into practical and feasible interventions?

Project Design

The project Safe Social Urban Design was a two years effort aiming to develop, transfer and apply practical urban design solutions for residential neighbourhoods. The objective of this project was to extend the existing knowledge about the relationship between social undesirable behaviour and the spatial structure of neighbourhoods. This to enable governmental authorities, housing associations, developers, urban designers and planners to implement interventions increasing the viability of both existing and new neighbourhoods and reduce the opportunities for crime, insecurity and nuisances. Besides knowledge development, the project also focused on knowledge transfer. By involving designing and developing parties, the research findings were tested and translated into concrete cases. This led to practical (re)design proposals and measures for the participating pilot districts.

The project consisted of four phases.

1. **Preliminary study** on the spatial structure of several deprived neighbourhoods and reference neighbourhoods which are similar in terms of social composition, seize and building period. This research led to the (provisional) conclusion that there are indeed spatial factors that contribute to the safety in some and unsafety in other neighbourhoods.
2. **National inquiry** in which 43 Dutch neighbourhoods with socio-economic disadvantages were compared with each other in terms of socio-demographic and economic composition, spatial characteristics and degree of crime and disorder. The results of this study are presented in another paper written for the 9th Space Syntax Symposium in Seoul (Van Nes and López 2013).
3. **Pilot studies** in eight residential neighbourhoods in Alkmaar, Deventer, Eindhoven,

Maastricht and Utrecht. In this study, the findings from the national inquiry were evaluated in eight pilot neighbourhoods and tested on a lower scale level (the street segment). Besides variables providing insight into the spatial structure of the neighbourhood, the analysis also considered the urban micro-level - the relationship between buildings and streets. These are site-specific variables related to the 'visibility' and 'identity' of a place.

4. **Consultation** of the five municipalities. During local workshops, the researchers worked closely together with local stakeholders to formulate several improvement scenario's. Various models for redesign were developed and tested both on their spatial properties, forecasted effects and feasibility. Together with the stakeholders it was then decided how these models could be translated into measures that are not only effective but (most importantly) also feasible to implement.

Involving the stakeholders

Gaining the active support of the designing and developing parties is essential when ensuring that redesign proposals are actually used. Various strategies were used.

First of all, a communicative approach is needed. Local stakeholders and policymakers often have specific agendas. Those agendas need to be recognised for identifying what stakeholders see as key issues for the neighbourhood. Mutual understanding and consensus need to be established and interactive workshops are a good way to achieve this (Forester 1989, Arnstein 1969). The challenge is to explain space syntax in such a way that it is understandable for the stakeholders and policymakers attending the workshops. For this, the space syntax jargon had to be translated into terminology acceptable and understandable for the involved stakeholders who have a practical rather than a scientific interest in the problems at hand. This is a rhetorical approach, where the pathos (the words used) and logos (the correlation between safety, vitality and spatial configuration) in re-design proposals has to be understandable for all involved parties (Asmervik 1997/1998). In this way, the local stakeholders feel an ownership of the plans. This is the projects button up approach.

The analytical approach was more a top down approach. It consisted of correlating crime data provided by the police with the space syntax analyses. The results were presented to the various policymakers and (other) stakeholders. In addition, fieldwork was carried out in all the neighbourhoods, consisting of a registration of the quality of buildings, public spaces, location of shops and services, and parks in the area, the liveliness of the streets and implemented crime prevention measurements (such as the Dutch Police Label Safe Housing).

The results from the analytical approach were used to construct several improvement scenarios for the neighbourhoods. These scenarios were presented to the local stakeholders and discussed at redesign workshops. Various models for redesign were developed and tested both on their spatial properties, forecasted effects on criminal opportunity and feasibility. Together with the stakeholders it was then decided if these models are in the neighbourhoods best interest and how they can best be translated into measures that are effective as well as feasible to implement.

The conceptual framework

The model Safe Social Urban Design uses five spatial principles or concepts. These concepts can be summed up by the keywords: Accessibility, Connectedness, Vitality, Visibility and Identity. These keywords are more understandable and acceptable for the involved parties/stakeholders than the technical jargon commonly used by space syntax researchers.

Accessibility

The term 'accessibility' is used to describe global as well as local angular integration with a topological radii. As space syntax research has shown, there is a strong and pervasive relationship between the pattern of integration and the pattern of real movement (Hillier et al 1993). The higher the degree of accessibility of the street system on various scale levels, the higher the number of people in the streets (Hillier et al 1998, Rueb and van Nes 2009). Conversely, a lower degree of accessibility reduces the number of people in streets resulting in less natural surveillance. Streets with a low degree of accessibility on a local level in particular tend to be affected by burglaries (van Nes and López 2010, Shu 2002, Hillier and Sabaz 2005).

With the evidence from various space syntax studies, the following two principles are used in the improvement strategies for the eight neighbourhoods. The higher the degree of street accessibility on local as well as the city level, the more it generates a mixture of visitors and locals on the streets. A balanced mixture of different user groups on the streets increases the degree of informal social control, which in turn reduces the opportunities for crime and anti-social behaviour and increases the feeling of safety.

Connectedness

The term 'connectedness' is used in this project to describe how the main route system going through and between neighbourhoods is connected to all the local streets. Under this concept, 'connectedness' refers to the angular analyses with various metrical radii.

Angular step depth analysis provides insight in how a main route is connected to the local streets. For this, all main routes are selected and for each street a calculation is made of the number of direction changes with angular weighting. Street segments with a sharp angle from the main routes get a much higher value than street segments with a shallow angle (Turner 2001). In this way it is possible to reveal how local dwelling streets are connected to the main route network. When most dwelling streets are more than two direction changes, or more than one direction change with sharp angles from the main route network, the area scores low. When a main route is located outside the neighbourhood, the local streets tend to get extremely low values in the angular step depth analyses. Conversely, when a main route goes through the area, most streets can often be reached within 2 direction changes. Research has shown that the higher the number of direction changes from the main route network, the higher the risks on burglary (van Nes and López 2010) and anti-social behaviour (Rueb and van Nes 2009). Therefore, the following principle is used in this project: the lower the number of direction changes from the main routes, the lower the burglary risk.

Vitality

Vitality refers to the spatial potential for vital street life and successful local businesses. Research has shown that an angular analysis with high metrical radius highlights the spatial potential for small businesses and non-commercial government service centres focussing on the local level,

whereas an angular analysis with low metrical radius identifies streets with potentials for vital local street life (van Nes and Stolk 2012). When a main route goes through the neighbourhood combined with high integration values, it contributes to the location of small businesses inside the neighbourhood (Hausleitner 2010, van Nes et al 2012). When a main route is located around the neighbourhood, the neighbourhood tends to lack small businesses and the area consists of only dwellings (Yu ye and van Nes 2012). It is important to explain to the local stakeholders and involved parties that a smart lay-out of the street network does not only limit the opportunities for crime and incivilities. It also shapes opportunities to improve the economic potential of the area and vital street life.

Especially the overlap between the angular analyses with high and low metrical radii appears to be important. When streets obtain high values in the angular analyses with both high and low metrical radii, then they are more likely local centres with variation of enterprises (van Nes, Mashhoodi and Berghauser-Pont 2012) and a higher degree of vital street life (Yu Ye and van Nes 2012). These streets tend to be well-connected to their direct vicinity and part of the main route network. Neighbourhoods with such streets tend to be described as lively and vital neighbourhoods with a lot of services, amenities and small shops and businesses. When the two analyses (angular analyses with low and high metrical radii) do not correspond, the neighbourhood lacks the spatial framework supporting urban vitality. These neighbourhoods tend to lack street life and various facilities.

What is meant by urban vitality implies that both visitors and inhabitants frequent streets and that various small businesses are located inside the area. Streets consisting of shops and retail, and with various types of people frequenting it, are often experienced as safe and lively by visitors as well as locals. Therefore, the following principle is used in this project. Main routes located through a locally integrated centre inside a neighbourhood generate opportunities for economic activities and a natural mixture between inhabitants and visitors.

Visibility

Visibility is all about 'to see and to be seen'. People want to see and know what is going on in their spatial environment and want to feel sure others do as well (Luten et al 2008). This has everything to do with spatial properties such as accessibility, connectedness and vitality, which bring people to the streets. But also lighting quality and unobstructed lines of sight are important. In this project, the level of lighting is not measured. It is, however, observed how visible the streets are from dwellings on ground floor level and how well dwellings are visible from streets. The position of entrances and windows are plotted on maps, which can be combined with space syntax maps. Separate maps are made providing insight in the extent to which public spaces are directly visible for visitors and residents, and the location of visual barriers. Regarding visibility, the following principle is used in this project. Both windows and doors located on ground floor level contribute to informal social control between people in streets and people inside buildings.

Identity

The identity of a neighbourhood - its character and atmosphere - is largely determined by the attractiveness of the neighbourhood, the clarity of the functions of the public spaces and intelligibility of its route system.

If the status and function of a place (private, semi-public or public) and who is responsible for its management is not clear at a glance to any first time visitor, it contributes to a bad impression

of the neighbourhood. The use of semi-public spaces almost always generates problems when the function or management of these areas is unclear (Luten et al 2008). In most cases, the function and management of a place is clear to anyone at a glance. Most people instantly recognize a park, terrace, front garden and parking and know who is responsible for it. Sometimes, however, the function and 'ownership' of a place is unclear. In those cases, the spaces are often perceived as no man's land. No one feels responsible for these places and law abiding citizens tend to avoid them.

A clear and recognizable routing contributes to a high degree of orientability for visitors and residents. This provides a concentration of traffic flows with various modes of mobility, which makes the place perceived to be safe. In architectural sense, the use of markings (which for example defines the boundaries of a terrace or front yard) and barriers contribute to consistency for orientation and identification (Jacobs 1960).

Attractiveness is also an essential element of identity. The character and atmosphere of a residential area is highly dependent on the degree to which visible attention is paid to the environment. This includes the aesthetic quality of the built environment, range of functions, maintenance and management and aesthetic, technical and social sustainability.

In determining the identity of a neighbourhood, data is collected on the quality and diversity of the buildings, the facilities provided, the amount and use of public parks and the level of maintenance and management. The following principles are used in this project. Clarity of functions, an intelligible routing system and attractive well maintained public facilities contribute positively to the character and atmosphere of the neighbourhood.

General findings

The first phase of the SSUD project consisted of a national inquiry in which spatial, crime and social data of 43 deprived Dutch neighbourhoods were collected and analysed on the neighbourhood level (van Nes and López 2012) and data of 4 neighbourhoods were studied in detail on the level of the street segment. This resulted in the model Social Safe Urban Design with various insights regarding the accessibility, connectedness, vitality, visibility and identity of neighbourhoods and their relation to the spatial distribution of crime and social parameters.

As it turns out, there are strong correlations between spatial accessibility and connectedness and crime dispersal inside the neighbourhoods. Street segments with poor values on accessibility, connectivity, vitality, visibility and identity are more often affected by crime and anti-social behaviour than streets with good spatial values. There are, however, examples of neighbourhoods (e.g. Oudegoedstraat in Deventer) where the technical standards of the dwellings are at such a high level that it overruns the poor spatial properties of the neighbourhood keeping the number of residential burglaries low. With regards to the social composition, it turns out that low skilled non-European immigrants and low-income people tend to be clustered in neighbourhoods that score low on the spatial analyses concerning accessibility and connectivity (Rueb and van Nes 2009, van Nes and López 2012). How and in which way accessibility and connectedness relate to criminal dispersal depends on the type of crime. As Valerie Alford already concluded, '*Different types of crime occur in different types of space*' (Alford 1996, p. 64).

The national inquiry resulted in several statements that have been taken into account during the in-depth study of the eight pilot cases and the definition of the urban renewal scenario's and

measures proposed to revitalize these areas.

- An integrated main route through the neighbourhood contributes to a natural mixture of visitors and inhabitants and to a mutual social control between them (Rueb and van Nes 2009). It also reduces the burglary risk due to a low topological depth between dwelling streets and main routes.
- Dwelling streets that can be reached within 1-2 times direction changes from main routes tend to have a lower burglary risk than dwelling streets with more than 2 times direction changes (van Nes and López 2010).
- Street with blind walls adjacent to services and local shopping centres contribute to a clustering of youngsters making noise and disturbances (Rueb and van Nes 2009).
- Neighbourhoods with streets with low values on the local angular integration analyses with a topological radius tend to lack street life and location of small local businesses.
- Neighbourhoods with streets that have high values on the local angular analyses with both high and low metrical radii have lower incidents of vandalism and anti-social behaviour of youngsters than neighbourhoods where these aspects do not overlap (van Nes and López 2012).
- Streets with high spatial integration contribute to more people in streets and to the location of small businesses (Hillier et al 1998, Hausleitner 2010). These streets are perceived to be vital and social safe streets.

The pilot studies yielded the following findings in relation to criminal dispersal.

- Residential burglary mainly takes place in the streets furthest away from the main routes, most commonly on places with low degrees of inter-visibility.
- Theft from cars is most common in streets close to the main routes, in particular on large parking lots.
- Threats and fighting are especially common in segregated streets with poor inter-visibility.
- Physical abuse and threats generally take place in streets that are poorly connected to the main route network.
- Anti-social behaviour of youngsters generally take place close to service and shopping functions on streets adjacent to the main routes, and spots with poor inter-visibility.
- Vandalism is most common along the main routes, at schools, youth centres and public transport stops/stations.

Eight pilot cases

The SSUD model and the findings of the national inquiry have been used to analyse eight neighbourhoods in five different Dutch municipalities, to develop scenarios and models for

revitalisation, and measures to improve the safety and vitality of these neighbourhoods. The eight cases cannot all be described as deprived areas. They all have challenges with regards to vitality and some of them have social or criminal problems. During local workshops, a wide range of both radical and minor interventions were explored and discussed with the stakeholders. In this paper only the final proposals are presented. The ones that according to all parties involved are both feasible and effective. The coming years will show which interventions are actually implemented and how effective they are.

The eight cases vary a lot in terms of social composition, building typology, building period and planning ideologies. Two of the neighbourhoods are yet to be built. The cases can be classified as: pre-war working class neighbourhoods (Rode Dorp in Deventer and Mariaberg in Maastricht), post-war housing neighbourhoods (Kanaleneiland in Utrecht, Pottenberg in Maastricht and Vaartbroek-Eckart in Eindhoven), and post-modern/new urbanism neighbourhoods (Hoge Weide in Utrecht and Vroonermeer-Noord and-Zuid). In this section, three of these neighbourhoods are described as an example of each category.

Pre-war neighbourhoods

Rode Dorp in Deventer is a typical pre-war working class neighbourhood. The area consists of 3 small boroughs, Driebergen, Rode Dorp and Oudegoedstraat, each with a different character. Driebergen and Oudegoedstraat are substantially renovated in recent years. Many old homes are demolished and replaced by new buildings. Many of these new houses are equipped with safety measures according to the Dutch Police Label Safe Housing. Police figures show that crimes like burglary and violence are much less common in Driebergen and Oudegoedstraat than in Rode Dorp. Social safety is a major concern in Rode Dorp, but there are also other social problems such as relative poverty and unemployment. The borough houses a relative high number of poor immigrant and youngsters.

In the spatial analyses, the area scores quite well. The area has gentrification potentials, due to its proximity to Deventer centre and because the area has relatively integrated main routes running through the neighbourhood. The most integrated streets have high values in the angular analyses with both high and low metrical radii. The accessibility of the main route Boxbergerstraat is high. The main route Enkstraat and many residential streets are however not so well connected and therefore more vulnerable to crimes such as burglary, assault and vandalism. Many public functions such as playgrounds and squares are located at segregated streets poorly connected with the rest of the neighbourhood. Rode Dorp has several streets with blind walls and several unclear routings. The area has a strong place identity in the vernacular architecture of the buildings. Most of the buildings are small-scale row houses. In the south-west, the area is disconnected to the surrounding neighbourhood due to the barrier formed by the rail track.

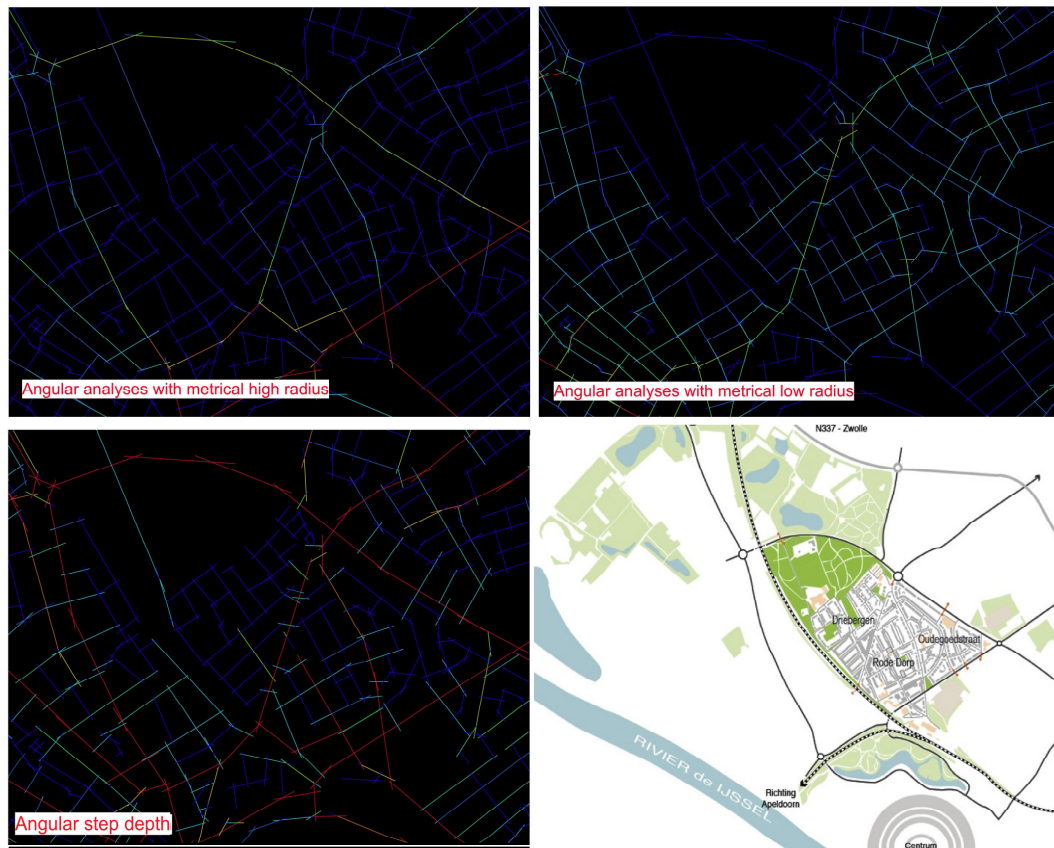


Figure1: Space syntax analyses for Rode Dorp in Deventer

To improve the safety situation in Rode Dorp and to create spatial potential for vital street life and small businesses, various design and urban renewal measures have been proposed. These measures focus on improving the vitality of the neighbourhoods' main route Boxbergerweg and the creation of a continuous cycle route along the rail track. Four different models have been proposed to increase the accessibility and connectivity of the three boroughs by linking several streets. On a micro scale level, proposals are made to improve the visibility around the school, the youth centre and some of the squares and parks as well as the accessibility and visibility of the small playgrounds. As can be seen in figure 2, the proposed changes increase the integration in the most segregated streets in Rode Dorp area.

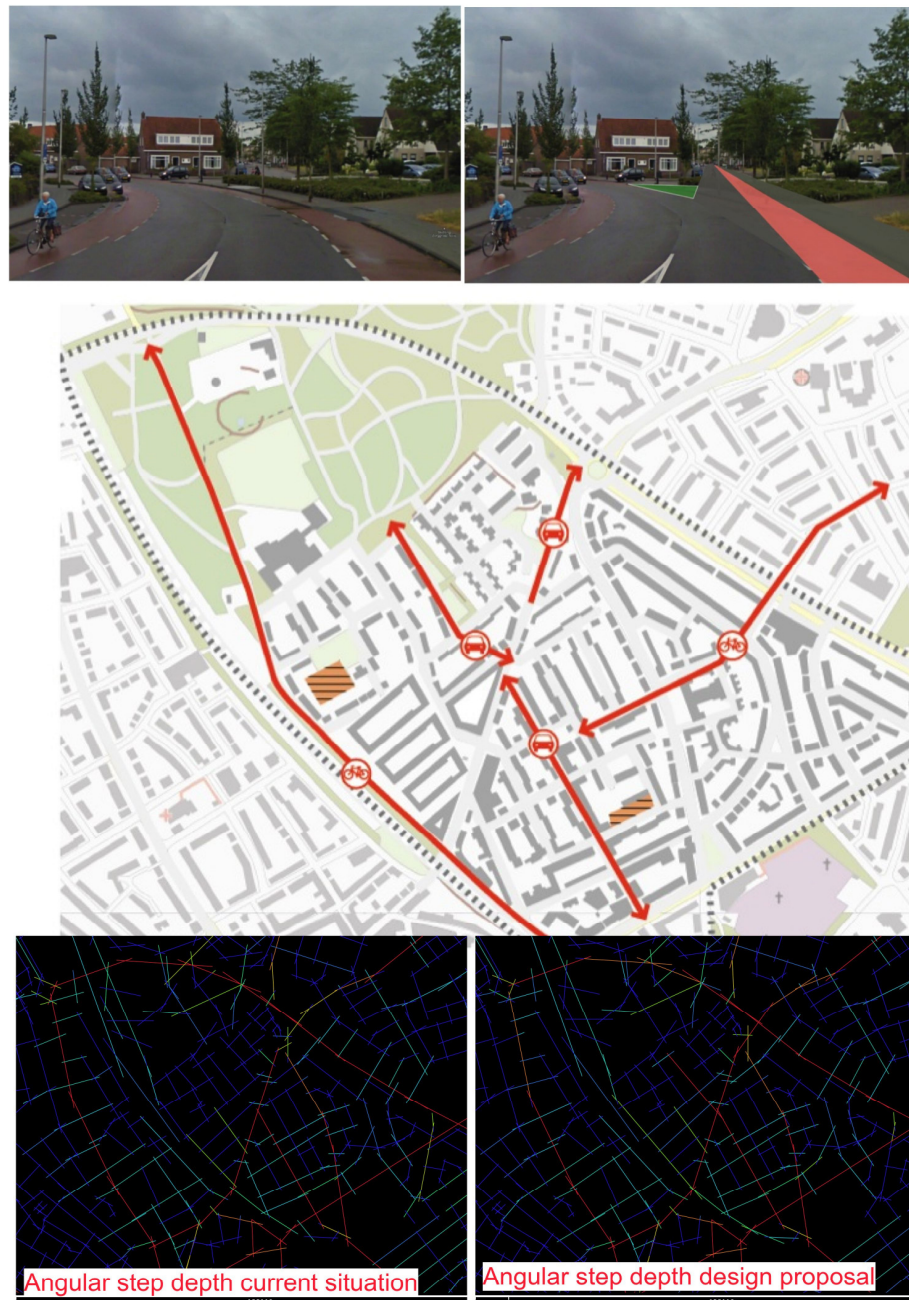


Figure 2: Improvement proposal for Rode Dorp in Deventer

Post-war housing neighbourhoods

Kanaleneiland (Utrecht) is a good example of a Dutch post-war modernist urban sprawl. Kanaleneiland is one of the most unsafe neighbourhoods of Utrecht. Its socio-demographic and economic position is weak and the spatial characteristics are poor on almost all investigated variables.

As the spatial analyses in figure 3 shows, the main routes in Kanaleneiland are mainly located around this neighbourhood. The main route between Kanaleneiland-North and -South has high integration values. The area has a grid structured street pattern which is broken up, due to a high number of T-junctions inside the area. Therefore, the various residential streets have low values in the angular step depth analysis. The local shopping centre in the area's southern part is located along streets with high values in the angular analysis with a low metrical radius, whereas the large inward oriented shopping centre for the northern part is located along the main route with high values in the angular analyses with high metrical radius. The dwellings in Kanaleneiland have their entrances on the most segregated streets in the area. The area has several playgrounds, but these are mostly located in segregated streets with little or no inter-visibility. Several of the playgrounds and the parking garages look deteriorated.

The key to improving the spatial conditions of Kanaleneiland seems to lie in the reconstruction of the neighbourhoods' broken up orthogonal grid structure. This grid structure has been broken up at several points over the last few decades, mainly at the hand of traffic engineers who reasoned it would be safer for pedestrians and bicycle riders when some streets were no longer fully accessible for motorized vehicles. The proposal for improving the spatial conditions in Kanaleneiland consists, therefore, in strengthening the main routes through the area. First of all, there is a need to make an internal main route in a north-south direction through the area, linking the northern and southern part of the area together. This route has to be well connected to the east-west oriented main route which currently divides the area. The connection to surrounding neighbourhoods must also be enhanced and the same goes for the connection between local dwelling streets and the main routes. Figure 4 shows the spatial analyses of the design proposal. On a lower scale, the pedestrian accessibility between the northern and the southern part needs improvements. There are some new buildings adjacent to the east-west main route, but they lack active frontages towards this main route. Inside the area, the back allies of the area should only be accessible for the relevant dwellers.

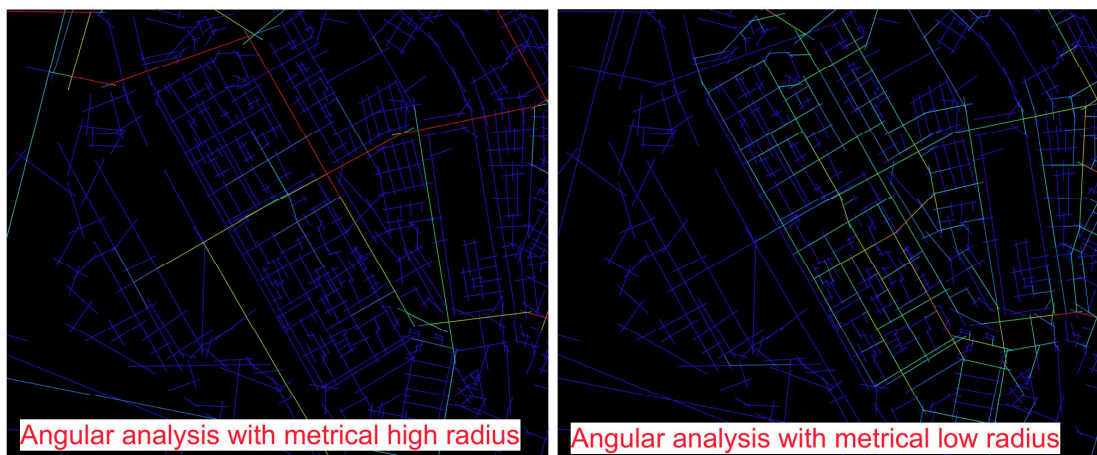


Figure 3: Space and crime analyses for Kanaleneiland in Utrecht



Figure 4: Improvement proposals for Kanaleiland in Utrecht

The post-modern/new urbanism neighbourhoods

Vroonermeer in Alkmaar is a good example of contemporary urban design practice in the Netherlands. The first part of this neighbourhood – Vroonermeer-South – was completed in 2005 and consists of 1,230 homes. Vroonermeer-North is yet to be build.

As the spatial analyses of Vroonermeer-South shows in figure 5, there are several spatial issues on various scale levels. Like many other post-modern neighbourhoods, Vroonermeer is designed as a low-traffic residential area. The program consists almost entirely of residential houses. Vroonermeer-South only has one side access point for motorized traffic. The routes for cars, bicycles and pedestrians are largely separated and the streets accessible for motorized vehicles are blocked at two places. This leads to a globally as well as locally segregated street pattern, offering poor accessibility between the neighbourhoods and its surroundings.

The spatial characteristics of the proposed plan for Vroonermeer-North are much better than Vroonermeer-South. There is no separation between fast and slow traffic. The borough is

accessible from both the north and south and vehicles can move through this area. In general, Vroonermeer-North's street pattern is better connected with the urban network than Vroonermeer-South. The main route running through the centre of this borough is fully accessible and well-connected.

There are several issues concerning visibility. Several houses both in North as South turn themselves away from the main routes and green spaces. The orientation of the buildings, the lack of meeting places and the low accessibility do not provide spatial qualities that strengthen the bond between the residents. The streets are relatively quiet. There are almost no visitors from outside the neighbourhood and the residents themselves have no reason to stroll the streets. The level of crime is still relatively low in Vroonermeer, probably due to the social composition of dwellers. Many of the residents are hardworking commuters. There are many children in the neighbourhood, but not so many teenagers. In ten years' time, this may of course all be different. The most pressing challenges at this moment are lack of street life inside the area and scarcity of commercial and service functions.

To improve this situation various strategies and measures have been proposed. These strategies focus on making some routes accessible for vehicles, improving the accessibility of Vroonermeer-South, making spatial and physical changes for improving the vitality of the neighbourhood, and creating a new local centre connecting the two boroughs together instead of separating them.

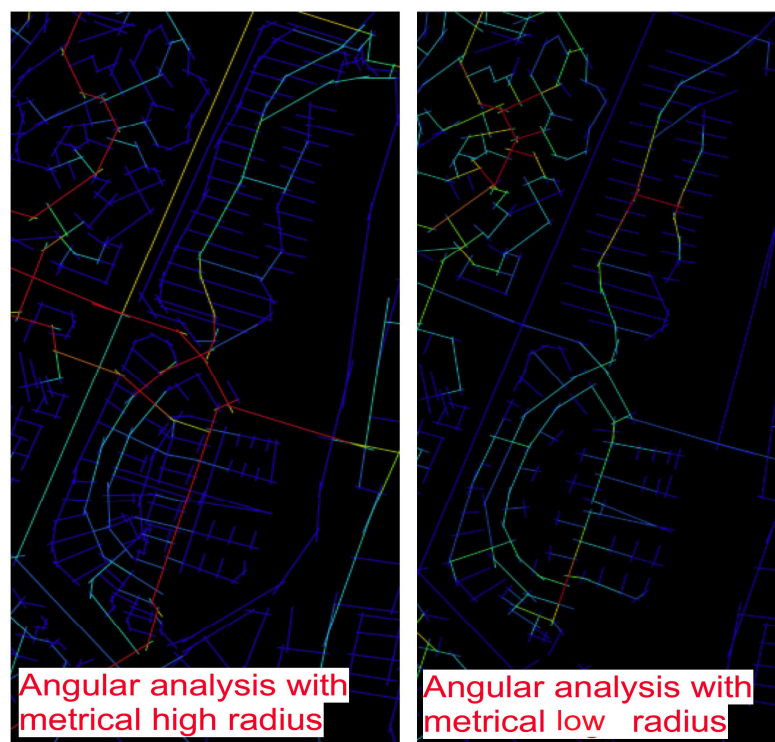


Figure 5: Space syntax analyses for Vroonermeer North and South in Alkmaar

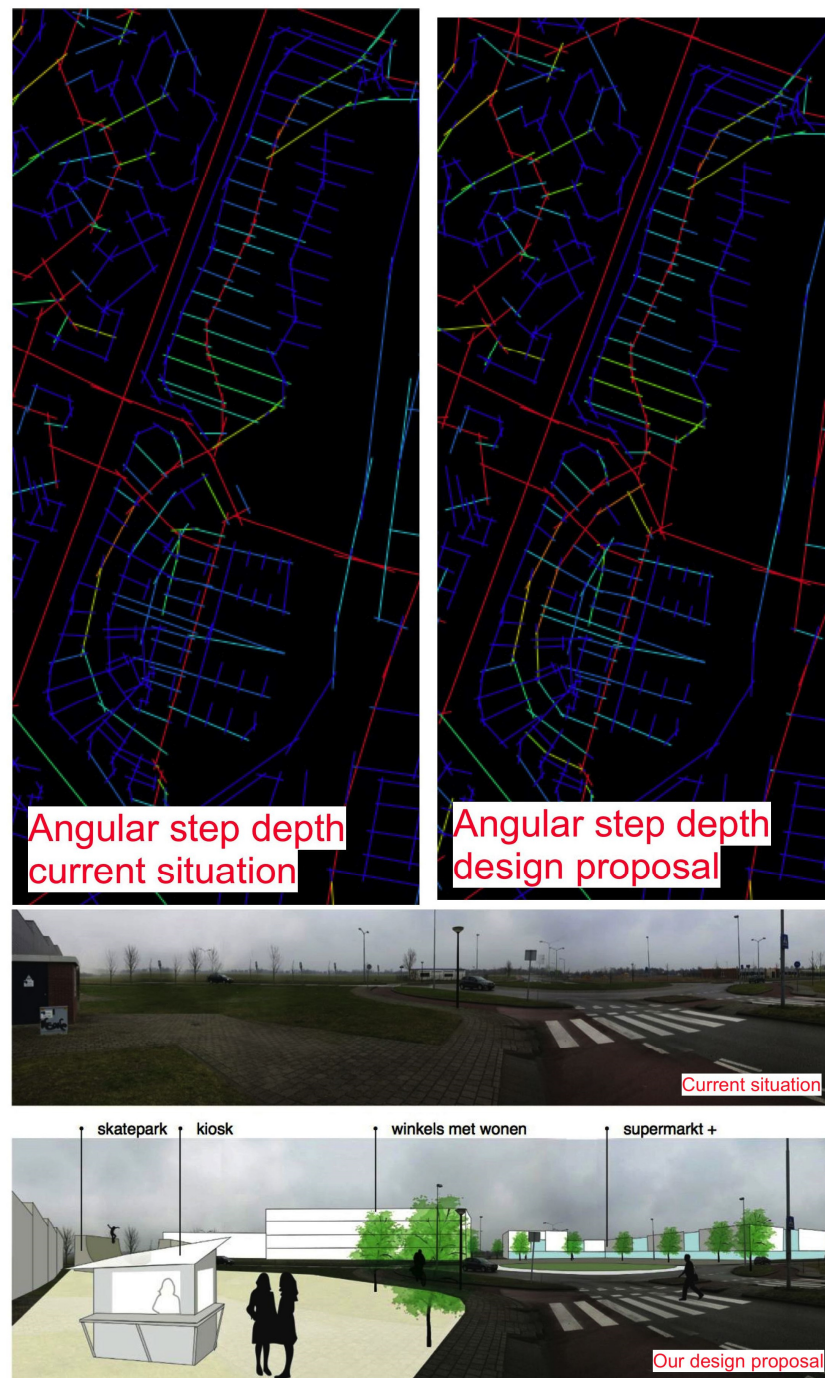


Figure 6: Design proposal for the area between Vroonermeer-North and -South in Alkmaar

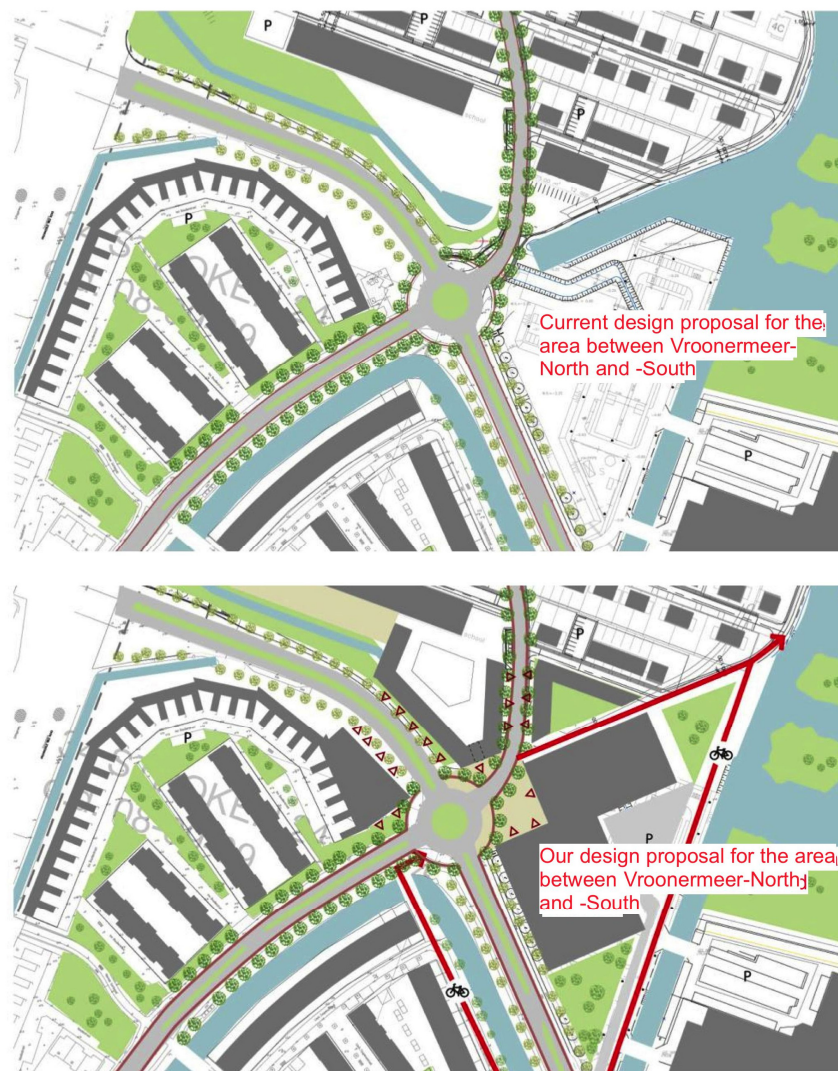


Figure 7: Design proposals for a new local centre for the area between Vroonermeer-North and -South

Epilogue – Challenges for urban regeneration practices

During the last few decades, space syntax has grown and been accepted by many scholars worldwide as a method not only suited for describing the spatial properties of the street network, but also as a tool for predicting the effects of possible changes. As such, space syntax is well suited as a tool for consultants and policymakers who want to make positive changes to the built environment and forecast the effects of those changes. Before using space syntax as a consultancy tool, there is a need to translate the technical vocabulary currently used in the space syntax community into terms understandable to practitioners and urban planners who have no knowledge of space syntax. In the SSUD project an attempt is made to formulate such a conceptual framework and to use space syntax as a tool to analyse different types of residential neighbourhoods. The objective is that this tool will not only be useful in formulating measures for the (re)vitalization of neighbourhoods, but also for making these measures acceptable to the policymakers and stakeholders who are responsible for the actual implementation. The utilization of the SSUD model and interaction with practitioners has yielded several insights, which may be useful for future research and consultancy practices.

Creating lively, vibrant and safe communities is not always the first priority of the stakeholders involved with the (re)development of neighbourhoods. Traffic safety, political and corporate agendas, and architectural expression are often considered more important than the spatial configuration. It is a serious challenge to deal with these other priorities when convincing the stakeholders of the advantages of spatial interventions. Especially the current emphasis on traffic safety was a serious issue in three of the eight pilot cases. Municipalities often employ several traffic engineers who have the final word in the design of the street pattern. The current traffic safety and road capacity regulations shape the mobility framework of neighbourhoods. In fact, the road engineer is the new urban designer, because he or she designs the spatial framework of a neighbourhood. The spatial conditions for street vitality and social safety on the one hand and traffic safety on the other are not always the same. Traffic safety is promoted by separating the different mobility networks, by locating the main routes outside the neighbourhood and by limiting the accessibility of residential neighbourhoods. Those measures create mono-functional neighbourhoods and are not favourable for an active street life, vibrant local businesses and natural surveillance.

Building companies and developers often want to maximise their profit on a short term. To realize this, they often try to acquire a building plot in which they can implement a single type of dwelling in the whole street or streets. The long-term effects on the neighbourhood itself, such as place quality, variation in building morphology and the relation between building entrances and streets are, however, seldom considered. At present, developers often try to improve the saleability of their projects by creating the image of intimacy. They create a sense of residential privacy and intimacy by turning the homes away from the streets. This design practice results, however, in an inward orientation of homes with no active frontages towards the streets. This generates a low level of human activities in streets and limits the possibilities for natural surveillance. When the street pattern is in addition tree-structured and without active dwelling functions on the ground floor level (e.g. because they are built up with storage boxes and parking garages), a spatial framework is created that does not support street life and has a negative impact on feelings of safety. The spatial separation of functions implemented in many modern and post-modern neighbourhoods contributes to a 'single-minded space use' fulfilling one function instead of an 'open minded' space use fulfilling several functions (Rogers 1999) and generates complex movement routes between the various functions. These routing systems tend to be unnecessary complex and limit the neighbourhoods' accessibility both on a global and local level.

Finally, there is a challenge to overcome the gap between the persons who design the neighbourhoods and the people who inhabit them. Often the designers of housing areas are 'trans spatial' people. These people work during daytime and have a broad social network in their leisure time not directly bounded to the neighbourhood where they live. The 'spatial dependent' people are the unemployed, the retired and the housewives. They are dependent on what the vicinity of their home offers them in terms of amenities and social activities. A large amount of spatial dependent inhabitants combined with a poor spatial framework for supporting social activities contributes to social unsafe behaviour patterns. Large groups of loitering youngsters, noise disturbances and anti-social behaviour can often be observed in these kinds of neighbourhoods. Therefore, there is a need to gain a spatial understanding on the needs of the spatial dependent people and to communicate that knowledge to urban designers and policymakers.

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