

Spatial Behaviour in Dutch Dwelling Areas Ref 123

How Housing Layouts Affects the Behaviour of its Users

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Keywords

spatial configuration; social structures; spatial behavior; housing layout; dwelling areas

Abstract

The aim of this short paper is to show how the spatial layout of neighbourhoods affect the behaviour of its dwellers. An area's social and spatial composition influences anti-social behaviour in built environments. However, social conditions can overrule spatial ones. A more adequate understanding of the relationship between an area's social and spatial composition requires studying a set of dwelling areas with and without social problems.

For an according, exemplary investigation, four different types of dwelling areas were analysed. Two pre-War dwelling areas were chosen - one with large social problems (Ondiep in Utrecht) and one without (Hof van Delft in Delft). Similarly, two post-War urban areas were chosen - one with large social problems (Oosterwei in Gouda) and one without (Ommoord in Rotterdam). Static snapshots were taken in all four areas, during a whole day and evening on a week day and on a weekend day. The results were correlated with the following spatial configurative analyses: all-lines analyses and segment based angular analyses (in order to identify the main routes through cities).

As it turns out, dwelling areas with a topological deep structure on their street net contribute to a separation of space use of various types of users. Group of youngsters tend to gather together in streets one topological step away from main streets or shopping centres with "blind" walls. The higher concentration of low income groups and immigrants, the larger the anti-social behaviour problems are in the dwelling areas in terms of vandalism and group forming of youngsters. Dwelling areas without main routes through them lacks a natural input of through travellers in which function as a social control for an area. Public spaces with low degree of inter-visibility of neighbours and few doors connected to streets affect an area's degree of safety and street life. In Ondiep, the unsafe part is the street with few dwelling entrances connected to it. Likewise, inter-visibility is reduced by the way all inhabitants have their curtains closed most part of the time. As this initial investigation suggests, streets with high degree of inter-visibility and adjacent to main routes can contribute to create safe and vital dwelling areas.

1. Introduction

So far, researchers dealing with anti-social behaviour and deteriorated neighbourhoods mostly focus on problem areas. Often investigations tend to take place in areas only having a certain reputation for being a "no-go" area. The social composition of the dwellers tend to consist of mostly immigrants, unemployed and low-income families, and the areas' spatial layout tend to be spatial segregated with few possibilities for social control and natural surveillance (Hillier 1996, chapter 5). In most cases the investigated areas are post war social housing areas with an unfavourable spatial layout consisting of dwellers with low income.

From a sociological perspective, unemployed and immigrants want in many cases to interfere with the street life in cities. In comparison with high income people, unemployed tend to be more dependent on what the direct vicinity offers of urban activities than those who spend most of the day at work. In order to reveal the relationship between the spatial layout of neighbourhoods and the social composition of dwellers, four extreme cases have been investigated. The following guiding questions are at stake. What kind of influence has the spatial layout of neighbourhoods on human behaviour? How much role does the social compositions of dwellers have, seen in relationship with the spatial properties, on the street life in neighbourhoods?

In this study two pre-War and two post-War housing areas are chosen as case studies. In one of the pre-War and one of the post-War housing areas are known to be vital and safe dwelling areas, where in the other one pre-War and one post-War housing area are known to be "problem" dwelling areas.

2. Description of the case study areas

The aim of this research is to reveal how the relationship between the social composition of dwellers and the spatial layout of the housing areas affect street life in neighbourhoods. In order to choose some appropriate examples of housing areas, some typical areas representative for modern as well as traditional Dutch urban design were chosen. A typical pre-War Dutch housing area consists of small streets and row houses shaping enclosed blocks. Mostly everyone knows each other in these kinds of neighbourhoods. The streets have high degree of inter-visibility from windows to streets and the way one can see right into the houses across one's home.

A typical post-War Dutch housing area consists of freestanding flats or row houses with many open spaces between the buildings. The streets are too wide for looking into neighbour's houses from one's own home, and in many cases neighbouring houses are not located parallel to one another. Hence, the streets have low inter-visibility and low degree of social control, since few windows and doors face the streets. Often the dwellers only know their direct neighbours. The streets' spatial organisation tends to be like a 'tree-structure'. Post-War housing areas are served by a distributed main route net located between the various neighbourhoods. These main routes are mostly used by vehicle transport. The local streets inside the areas have a non-distributed structure with few possibilities for through traffic. In addition, these neighbourhoods have a separate movement network for bicycle and pedestrian movement.

For the social composition of dwellers, the aim is to find one example from each of the above-mentioned types of urban areas where the dwellers have low income and high degree of unemployment. From the central bureau of statistics, it was searched for areas with a high number of inhabitants with a minimum income. Unemployed people have a high amount of free time, in which implies they are often present or visible in streets in their local neighbourhood.

Conversely, the same account for finding one example from each where middle-income dwellers live. Dwellers with middle income work mostly 4-5 days a week. They are mostly present in the neighbourhoods after 6 pm on weekdays, in which implies they are not visible in local streets during daytime on weekdays. Moreover, middle-income people use the weekends more intensive than the unemployed for leisure activities. Hence, they are lesser dependent on what the direct vicinity offers than the unemployed.

The following neighbourhoods were chosen for case studies:

- Oosterwei in Gouda: a typical post-War neighbourhood built in the 1960's and 1970's with many inhabitants with low income.
- Ondiep in Utrecht: a typical pre-War neighbourhood built in the 1920 and some new houses from the 1980's, with many inhabitants with low income.
- Ommoord in Rotterdam: a typical post-War neighbourhood built in the 1960's and 1970's with many inhabitants with modal income.
- Hof van Delft in Delft: a typical post-War neighbourhood built in the 1920's and 1930's with many inhabitants with modal income.

All the chosen neighbourhoods for the case studies are located in a 10 - 20 minutes bicycle distance from the town and city centres. The locations are located with a 20 – 40 minutes walking distance from the railway stations. In Ommoord a metro station is located on the edge of the neighbourhood. Moreover, every location has, outside dwellings, the following functions: supermarket and some small detail shops such as flower shop, bakery, cheese shop or some ethnic specialities related shops.

3. Research methods

For the spatial analyses, the following space syntax measures were taken into account. On the macro scale it was analysed how integrated the various neighbourhoods are in the city as a whole through using the axial map. The local angular analysis is able to highlight the main routes going through and between urban areas, as well as highlight their degree of spatial integration. The various spatial analyses is able to show how well connected a neighbourhood is to its vicinity and the town or city as a whole. Figure 1 shows the location of the four neighbourhoods on a global integration map of their respective cities and towns.



Figure 1

The location of the 4 investigated neighbourhoods.

On a meso scale, the point depth and the all line analyses were used in the neighbourhoods. The boundaries of the neighbourhoods were the boundaries for the meso scale spatial analyses. On a micro scale level, the location of entrances and windows were taken into account through a manual registration on the various sites. In particular the degree of inter-visibility from windows to streets and various degrees of connectivity between private and public space were taken into account.

For the registration of human behaviour in the various neighbourhoods the static snapshots method was used. For every hour, human behaviour in all spaces in the various neighbourhoods at a certain moment was plotted on a map. It was registered where people sit, stand, and walk (and in which direction). Moreover, a distinction was made between gender, age and ethnic origin. For the age, the following four groups were made: children, youngsters, adults and old people. For the

ethnic origin, a distinction was made between Europeans and non-Europeans. In all neighborhoods it was easy to make such a classification. An ordinary weekday (Thursday) and a Sunday were chosen for these kinds of registrations. Public holidays or days with particular events (such as a fasting period) were avoided. The time periods for the registration were from 8 am to 10 pm. The weather on these days was a typical Dutch stable autumn weather (in October), light cloudy, and sometimes a little rain, sometimes for a short time sunny. It was not particularly cold or warm during the chosen registration days.

The results from the static snapshots were correlated with the spatial analyses on the various scale levels. In particular several correlations were found between the static snapshots analyses and the all-lines analyses and the micro scale analyses. In the following section, the results from the spatial analyses and the human behaviour registrations will be presented.

4. Oosterwei in Gouda – the post-War area with social problems

Oosterwei is known to be one of the worst neighborhoods in the Netherlands. During the study period, the area's reputation was in general low. Its nickname is "the Moroccan neighbourhood". In particular young women are warned not to walk there alone from the outsiders dwellers. Recently the public busses refuse to travel through the area due to anti-social behaviour from youngsters and the fear of robbery. About 40% of the dwellers have a minimum income and 70% of the dwellers are non-European – mostly from Northern African countries.

Most of the housing stock consists of apartments in flats of 4-5 floors. There are no dwellings on the ground floor level in these flats, in which means no windows directly connected to the streets. Between these flats there are several public grass fields (seldom used by anyone) with some low trees and bushes. There are some playgrounds for children. There are two blocks with row houses with dwellings on ground floor level. In the area's northern part there is one cul-de-sac with two families detached houses.

In the area's western part, several local services are clustered together such as a supermarket, mosque, a church, a pharmacy, an Islamic butcher, bakery, vegetable shop, two community houses, a tea house, and a telecom shop with very limited opening hours. Furthermore, there is a field close to the centre where people often play football.

In the macro scale analyses, the streets inside the area with the highest integration are located on the area's edges. In particular the road on the area's south boundary are highlighted. It is the only road in this area, which is frequented by both through travellers and locals. It can be concluded that the area has no main routes going through the area where a natural mixture of local dwellers and visitors take place. The entrance into the area occurs from its edges. This is a typical feature for Dutch post-War housing area.

When revealing the spatial analyses from the meso scale analyses, as shown in figure 2, the most integrated core is where the supermarket and all services are located. The most segregated areas are on the edges, in particular in the area's northern parts. Most locals frequent the areas around the centre, while it is silent in the northern parts.

When overlaying the various data from the static snapshots and grouping the results under various themes, some understandings on the relationship between space and human behaviour can be derived.

When revealing the flow of people through an ordinary weekday, the largest flow is on the western part of the area. This is caused by a location of a low price supermarket (LIDL) 300 meters outside the area. Otherwise, there are most people in the streets at the neighbourhood's centre with a large clustering of urban functions. The most silent streets are in the cul-de-sac street in the area's northern part. In the weekend, most activities take place around the centre, even though the shops are closed.

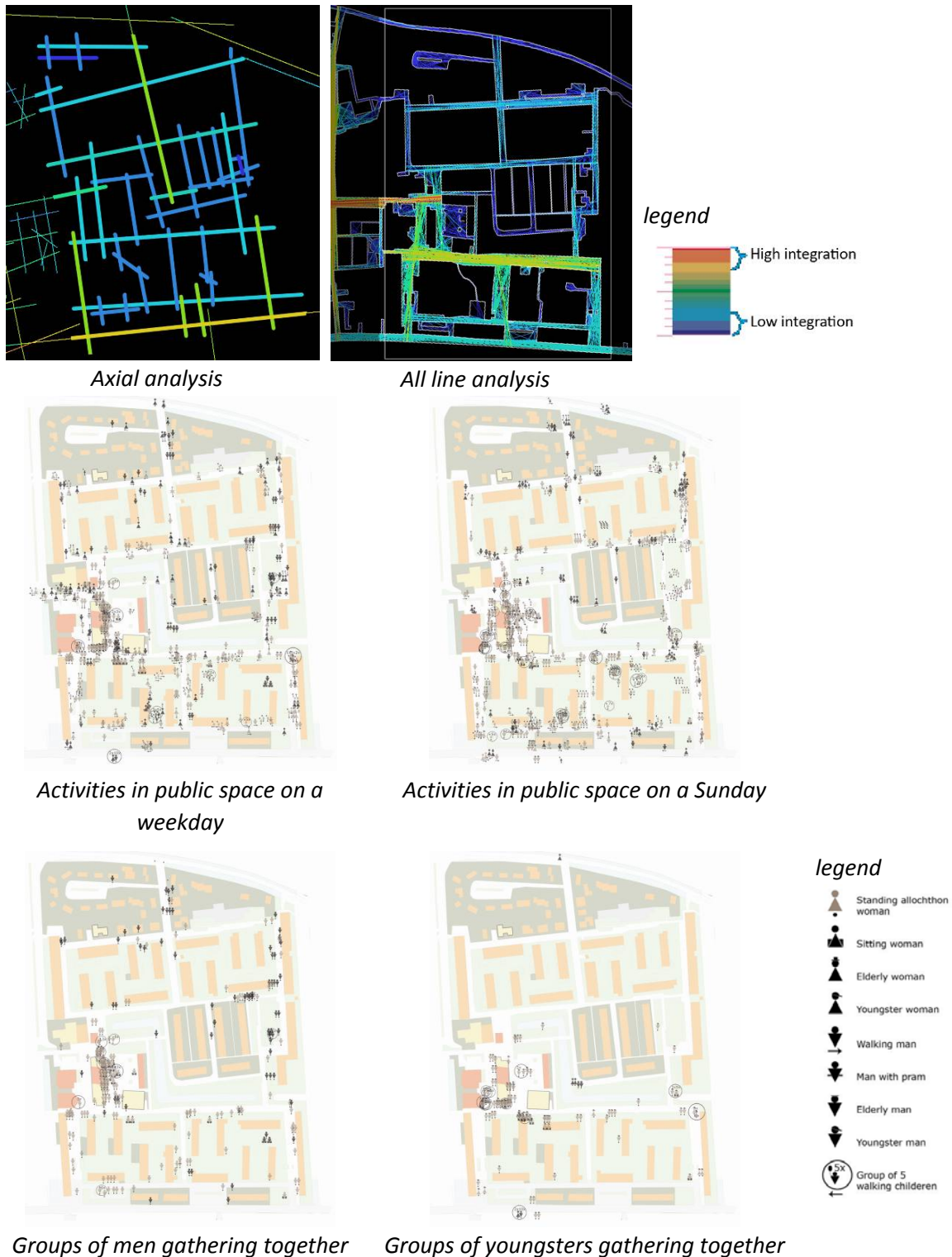


Figure 2
The analyses of Oosterwei in Gouda.

The various registrations were put in a statistical database. Through an ordinary weekday there are fewer people on streets than in a weekend, which was not presumed before the registrations took place. Since shops are closed on Sundays, it was expected to find more people in streets on a weekday than on a weekend day. The same results were found in the other three case studies. In the Oosterwei area it is striking that there are few women in streets on a Sunday. During the weekdays, women are present in street life, but are lacking on certain moments on a Sunday. The

same can also be seen in the other three case studies. There are two explanations for this. The one is that the vicinity offers activities for mostly men such as father-son football or activities taking place in the mosque. The other explanation is that women tend to frequent streets that are more spatially integrated on macro and meso scale and when the shops are open (Tra My Ng, 2009). What is also striking from the statistics is that non-European dominates the street life on a weekday as well as on a Sunday. On Sundays there are more non-European and children in streets than on a weekday.

When comparing the results from the static snapshots with the all lines analyses (figure 3), the results comply with the dispersal of the integration values. The more spatially integrated the street is, the more people on streets. Conversely, the more spatially segregated the streets are, the fewer people on streets.



Figure 3

All-line analysis combined with static snapshots of human behaviour in Gouda

Since the Oosterwei area is suffering from larger groups of youngsters gathering together and making life unpleasant for others, the location where they gather were also registered carefully and discretely (with a certain risk for the researcher becoming involved in trouble). As it turned out, the Oosterwei area has two types of larger groups gathering together. One is the group of youngsters and the other is a group of men, mostly Northern African men. Spatially, the group of men gather together at the front of the shops and services in the high locally integrated streets. The groups of youngsters gather together in a more segregated street one topological step away from the most integrated streets. On a micro scale level, they gather together in streets, which have “blind walls” with no windows and few entrances (mostly back doors).

As a test, some registrations were done during the Ramadan. As it turned out, there were almost nobody in streets, except between 4-5 pm. Then it is very busy in streets, since people go shopping for buying all the food for the evening dinner. After 5 pm it was again very silent in Oosterwei's streets.

5. Ondiep in Utrecht – the pre-War area with social problems

Ondiep in Utrecht represent a working class housing area from the 1920's with some new houses from the 1980's. During the study period it was not particular a problem neighbourhood. Some months after the inquiry was finished, several revolts took place in Ondiep. Someone got shot, in which increased the area's bad reputation for belonging to one of the worst neighbourhoods to live in the Netherlands. About 30% of the dwellers have a minimum income.

The area consists of mostly row houses, and some 3 floors flats in the middle of the area, built in the 1980's. The entrances to the upper floor dwellings can be reached by staircases from the street level. In the area's eastern parts, some canal boathouses are located. In the row houses, some of them have front gardens and some have not. The hierarchy of the street net is very understandable in their design. In the middle one has one broad streets with some smaller side streets. In all side streets there are row houses and in the main street the 3 floors flats are located.

In the area's northern and eastern parts, there are some public parks consisting of grass fields and some trees. The parks are mostly used as a “dog-toilet”. In the northern part, there is a sport and playground for big children, such as a basket net and some fitness and climbing devises. A playground for smaller children can be found in the centre of the area.

In the area's edge, a local supermarket can be found. The supermarket looks shabby and deteriorated and has diverging opening hours. Inside the area, there is a dart shop and a snack bar. Other services, such as a school and a community house with a kindergarten are located inside the area.

Like the Oosterwei area in Gouda, the highest integration in Ondiep is on its edges in the spatial analyses on the macro scale. There one has a natural mixture of locals and through travellers in streets. In the meso scale spatial analyses, as shown in figure 4, the central local main streets have the highest integration values. Most locals have to travel though this street in order to reach the spatial segregated remaining dwelling streets.

When comparing the results from a weekday and a Sunday from the static snapshots analyses, no significant differences can be seen. Since there are few shops in the area, and the local supermarket does not seem to attract customers due to its shabby appearance, its small assortment, and strange openings hours, then these results are not surprising.

In general there are few people in the streets in Ondiep. There is no large group of youngsters and few people stand or sit in the public spaces. Most people go for a walk with their dog. The spatially most integrated main street is the most silent street. Hence, there are few correlations between the all line analyses and street life. From a micro scale spatial perspective, most of the windows have the curtains closed most of the time. In this way the inter-visibility between private and public space is reduced. The unemployed are mostly home during daytime, sitting inside their homes watching television. In the Netherlands, people tend to have the curtains open in most homes. Ondiep deviates from this. In the most integrated main streets, there are few direct connections between

private and public space through the way apartments in the first floor are connected to the streets with staircases. The entrances to the ground floor dwellings are slightly hidden away and there are lesser windows connected to the main street in comparison to the other main streets. Hence, there are few eyes on the main street to have a certain social control and inter-visibility on the street life.

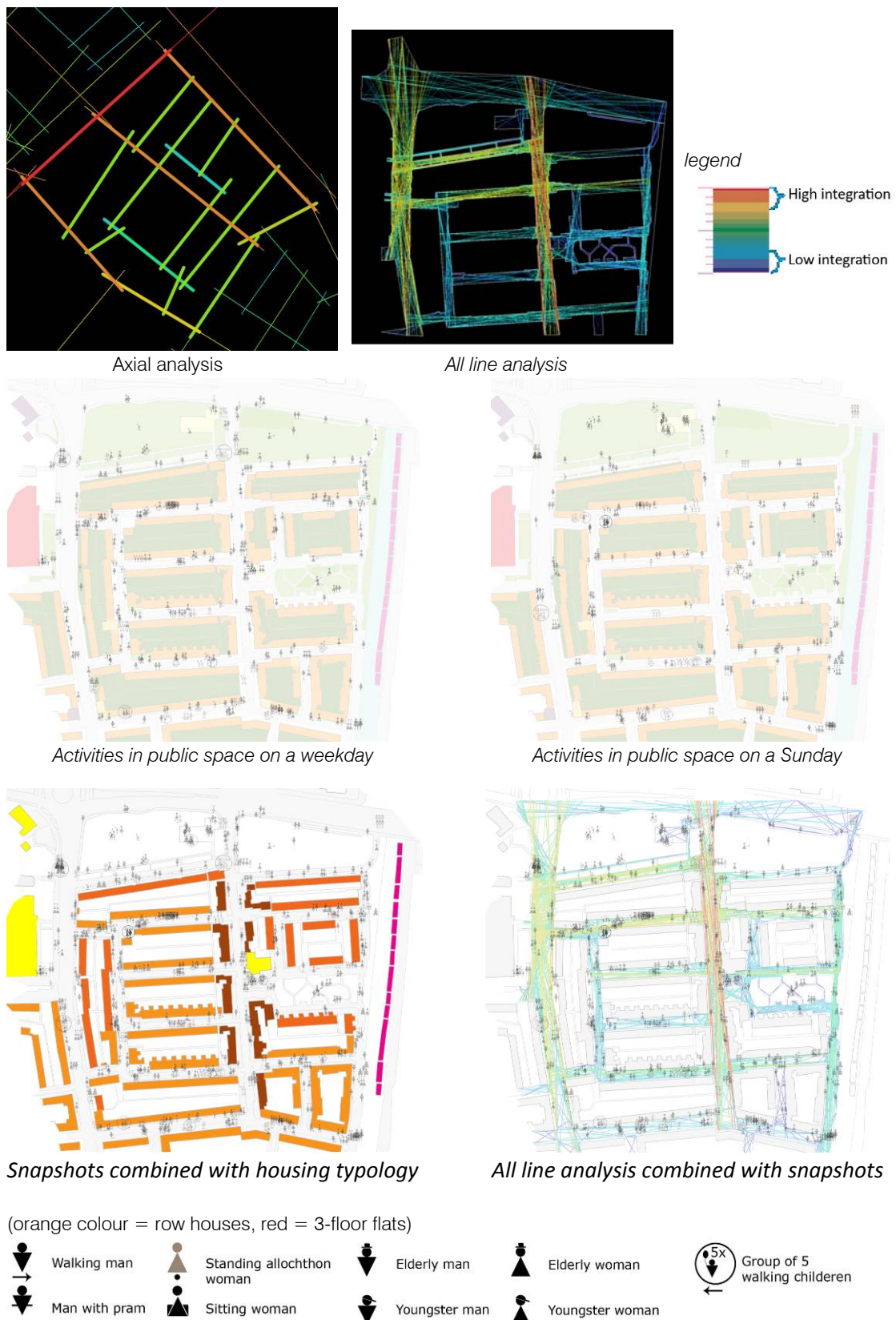


Figure 4
The analyses of Ondiep in Utrecht.

6. Ommoord in Rotterdam – the post-War area with no social problems

Often post-War housing areas are synonym with social problems. As Hillier and Shu writes, poor people are left over in poor housing areas whereas the well-off move out (Hillier and Shu 2000). Finding a typical Dutch post-War housing area with no social problems are not easy. However, there is one located in Rotterdam – a city that has several of the worst problem housing areas in the Netherlands.

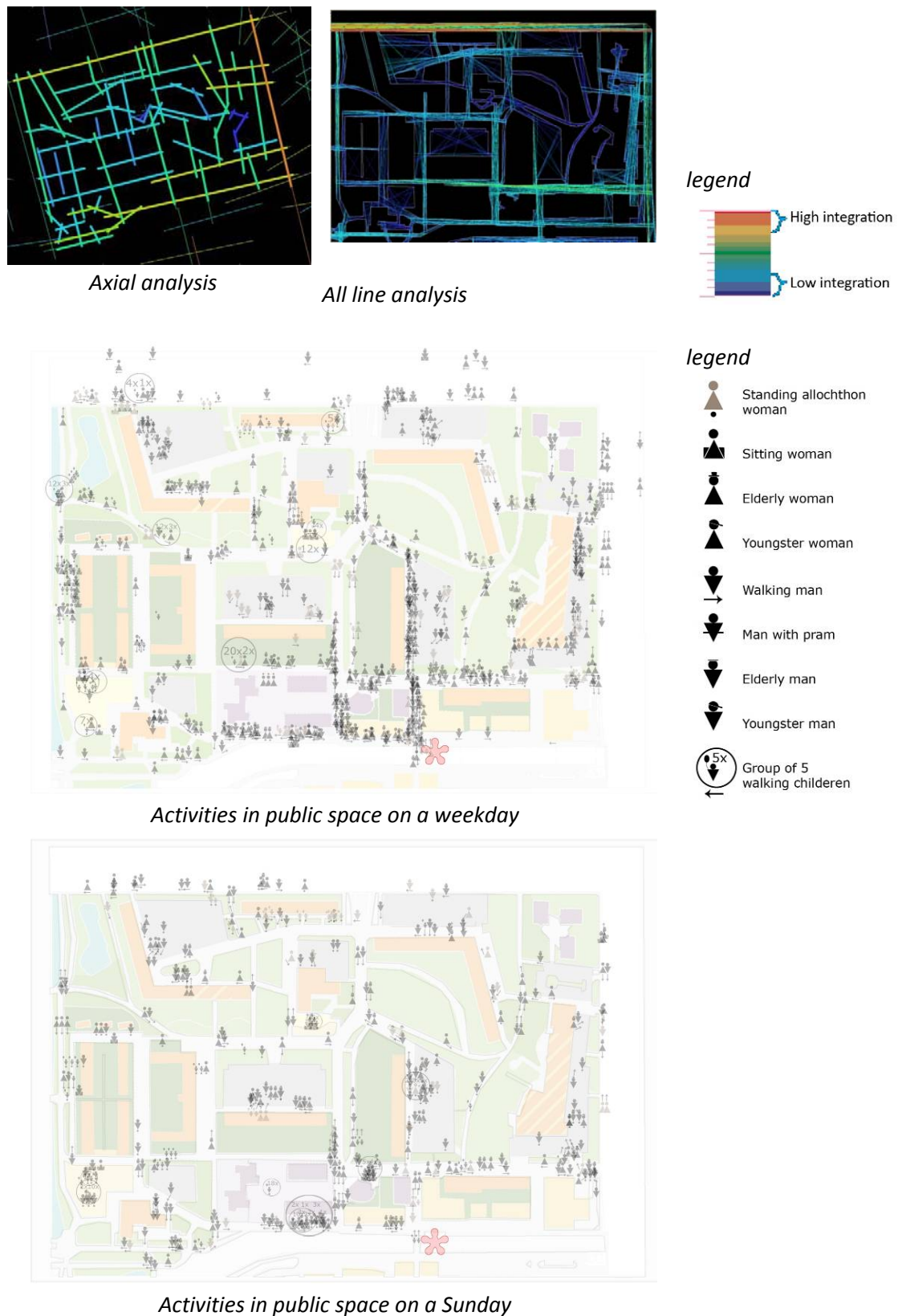


Figure 5
The analyses of Ommoord in Rotterdam.

In Ommoord most dwellers have a modal or slightly higher income than average. One flat is a service centre for elderly. Hence, most of the area's dwellers are elderly people. In this case a guiding question was to find out how people do behave in post-War areas when there are no low-income people or few youngsters living in the area. The area consists of mostly 9 floors flats. One flat has 22 floors. Between the flats there are large green fields with some smaller bushes. Recently, these bushes were very large. They were cut for safety reasons, in order to improve the inter-visibility. Some flats have private grass fields. Much of the public open spaces are used as parking places, in which contributes to that the area does not look very attractive or inviting to stay outside. In the area's western part, there is an urban block with row houses.

In the southern part, the various services are located. The most important function is the metro station. Just outside the area a large shopping centre is located. Inside the area itself, several special shops are located, such as a kitchen specialist, car dealer and a bicycle shop. Furthermore, in the service flat for elderly several functions are located on ground floor level. There is also a school, a community house and a church.

As the results from the spatial integration analyses on macro and meso scale shows, the most integrated streets are on the area's edges (figure 5). Most through traffic to the city and to the area itself are on the streets on the edges. In the area's central parts, all streets have low integration values. In comparison with the two previous cases, the results from the all-line analysis do not deviate from the angular analyses of the whole city. Ommoord seems to have a clear spatial logic. The central core is segregated on all scale levels.

When revealing the results from the static snapshots, there are fewer people in streets on Sundays than on weekdays. Most people can be found in the area's southern part on weekdays, in which where the metro station and a shopping centre is located. On a Sunday, most people can be found around the church and the local community house. These kinds of activities function as attractors for the locals in such a spatially segregated area. On the integrated streets on the area's edges, mostly through traffic by vehicle transport takes place.

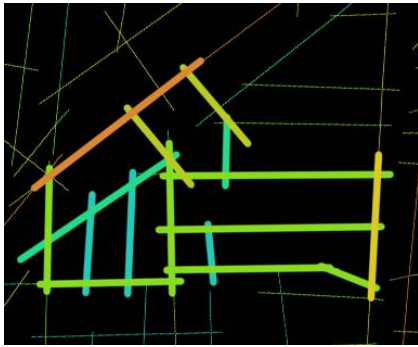
In general, it is a quiet housing area, where its spatial layout supports the inhabitants' lifestyles. There are few spatial possibilities for street life, since parked cars cover a large part of the area. Most of the area's inhabitants have a wide social network, not directly bounded to the vicinity. Hence, Ommoord's dwellers are not so spatial dependent as the unemployed.

7. Hof van Delft in Delft – the pre-War area with no social problems

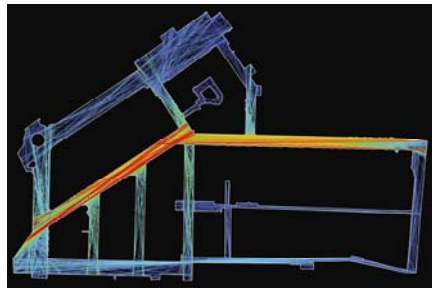
It is easy to find a pre-War area with no social problems. The Hof van Delft is an old working class area located at the western side of the rails of Delft. Most of the dwellers have a modal or slightly higher income than average. The area consists of only row houses, some with a small front garden and most of the homes have small private gardens. There are no parks in the area. There is a large public park from 1900 with trees and lakes 5 minutes walking from the area. It has high quality of landscape architecture. In the area itself, the public spaces are only the streets and the pavements.

In the area's northern part, various facilities can be found. There is a local supermarket and a vegetable shop. Moreover, a snack bar, Chinese restaurant, hairdresser, meat shop, travel agency, medical services, a hotel, car repair garage and several other services are scattered around in the area.

As it turns out from the spatial analyses, the northern street is the most integrated street in the macro scale analyses. The local supermarket serves a large range of local areas. The locals from an adjacent dwelling area use also these shops. Hence, this shopping street is well integrated in a larger part of Delft. In the all-lines analyses, as shown in figure 6, the street where the Chinese restaurant is located is the most integrated one. If one had included the adjacent neighbourhood in the all-lines analyses, the northern street would have turned out to be the most integrated one. On a micro scale level, all entrances are directly connected to the street and there are no blind walls in the area.

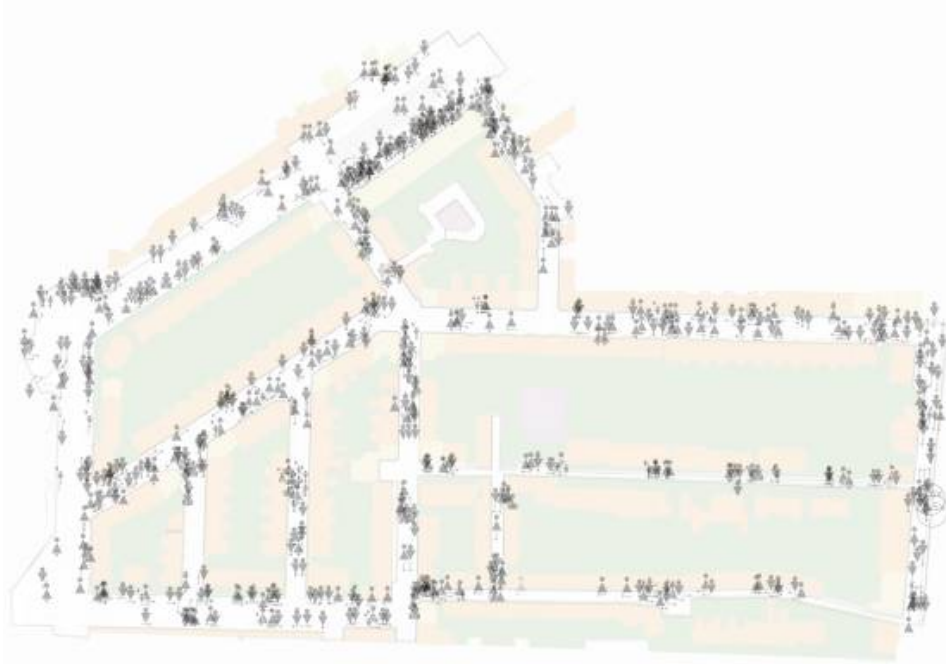
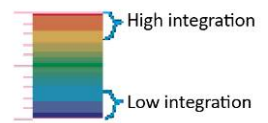


Axial analysis



All line analysis

Legend

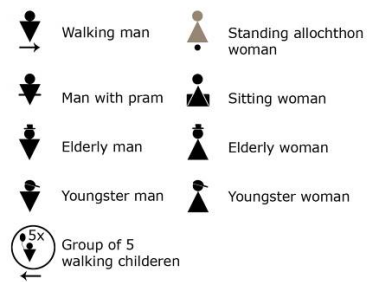


Activities in public space on a weekday

legend



Activities in public space on a Sunday





Activities in public space on Sunday after 4pm

Figure 6

The analyses of Hof van Delft in Delft.

As the results from the static snapshots show (figure 6), there are more people in streets on weekdays than on Sundays. Most people frequent streets where the supermarket is located on weekdays, while the dispersal of people are distributed equally in all streets on Sundays. Every street is frequented at any time of the day. Most type of people frequenting the Hof van Delft's streets is old people and adults with children. Often they walk to the shop and the various services. On the way they stop and talk with neighbours they meet on their way.

The Chinese restaurant functions as an attractor in the area, in particular on Sunday afternoon. It generates flow of people in the area and through the area. The quality and price of their take-away service is well known in the larger neighbourhood. Hence, they generate street life in the neighbourhood on times when shops are closed.

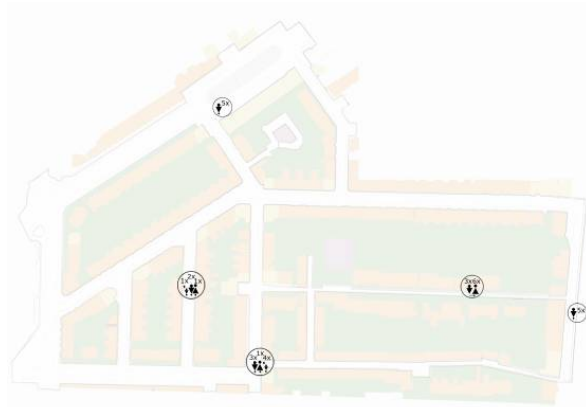
8. Comparison and discussion

When comparing the research results from the four case studies, some issues will be discussed. One is the issue of the shaping of large groups, the relationship between standing, sitting people and moving people, the role of attractors, the social composition of dwellers and the spatial layout.

What is striking is that people tend to gather together in large groups in post war areas in comparison with pre-War areas. The few groups registered in Delft consisted mostly of a mix of men, women and children. Some more groups on streets were found in Ondiep. In this problem area, the groups consisted mostly of immigrant children and youngsters, mostly boys. In the post-War housing area Ommoord, a higher number of groups were registered. These groups consisted of a mix of children, men, women and old people. In Oosterwei, the highest number of grouping was found. There groups are mostly immigrant children and youngsters, only boys, and immigrant men. Figure 7 shows the location of the shaping of groups in the four neighbourhoods, while figure 8 shows a statistical overview over the types of activities in public space.

As concluded, a traditional urban area does not generate the shape of larger groups. Even though the social composition of the dwellers consists of low income people and the area's reputation is bad, the spatial layout contribute to reduce or increase the number and size of grouping of youngsters. However, the social composition of dwellers somehow influences the way people

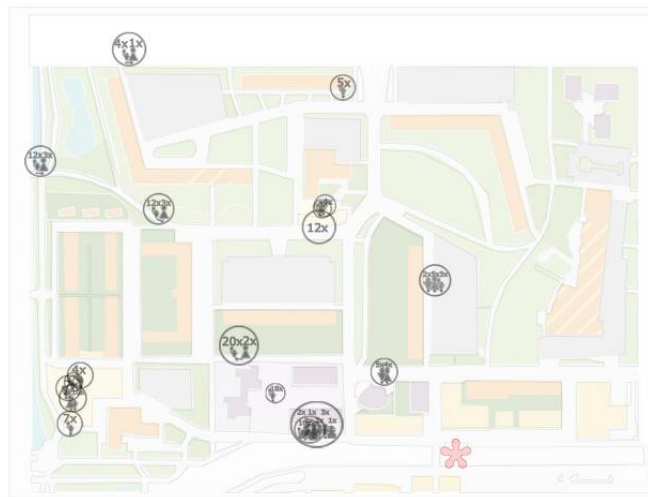
gather together in streets and the types of people joining the group. In particular unemployed young men tend to gather together in urban spaces, in particular in streets one topological step away from the most integrated streets and in streets with “blind walls.”



Location of groups in Hof van Delft in Delft



Location of groups in Ondiep in Utrecht



Location of groups in Ommoord in Rotterdam



Location of groups in Oosterwei in Gouda

Figure 7:

The location of the gathering of groups in the four neighbourhoods.

Numbers by gender	Rotterdam Weekday		Rotterdam Sunday		Delft Weekday		Delft Sunday		Utrecht Weekday		Utrecht Sunday		Gouda Weekday		Gouda Sunday	
	Numbers	in % :	Numbers	in % :	Numbers	in % :	Numbers	in % :	Numbers	in % :	Numbers	in % :	Numbers	in % :	Numbers	in % :
Men	169	23%	116	26%	293	44%	113	37%	113	25%	69	20%	212	37%	225	29%
Women	204	28%	88	20%	233	35%	78	25%	135	30%	53	15%	130	23%	55	7%
Elderly men	74	10%	69	15%	33	5%	22	7%	37	8%	23	7%	26	5%	30	4%
Elderly women	108	15%	54	12%	31	5%	13	4%	18	4%	11	3%	13	2%	11	1%
Youngsters men	12	2%	20	4%	21	3%	14	5%	33	7%	86	25%	77	14%	139	18%
Youngsters women	13	2%	4	1%	1	0%	3	1%	24	5%	19	5%	21	4%	12	2%
Children	141	20%	100	22%	61	9%	64	21%	88	20%	90	26%	87	15%	305	39%
Total	721	100%	451	100%	673	100%	307	100%	448	100%	351	100%	566	100%	777	100%
Numbers by activity																
Walking	497	69%	210	47%	439	65%	141	46%	157	35%	85	24%	240	42%	212	27%
Standing	181	25%	221	49%	213	32%	148	48%	266	59%	223	64%	303	54%	526	68%
Sitting	43	6%	20	4%	21	3%	18	6%	25	6%	43	12%	23	4%	39	5%
Total	721	100%	451	100%	673	100%	307	100%	448	100%	351	100%	566	100%	777	100%
Numbers by origin																
Allochthon	95	13%	68	15%	6	1%	19	6%	77	17%	97	28%	400	71%	668	86%
Autochthon	626	87%	383	85%	667	99%	288	94%	371	83%	254	72%	166	29%	109	14%

Figure 8

Statistical comparison of the registration of human behaviour

When comparing where, when and how people move, sit and stand in streets, in all four most people move in streets on a weekday (figure 8). An explanation is that most services, shops and schools are open on weekdays. Many people are on the way to or from work or from the shops, in which affect the degree and type of street life in the area. In the weekend most people tend to stand and sit in public spaces in comparison on the weekdays. Seemingly, people tend to have more time for interacting with one another on weekends than on weekdays.

One micro spatial parameter affecting the way people interact with their neighbours is the way entrances are located to streets. In row houses, the topological depth between private and public space is low. On sunny days, people take a chair and sit on the front of their houses. It affects the way random passers by stop and talk with the local dweller. In post war areas, there are benches located, but they are seldom used. Likewise, no people take their chair and sit on the front of the flats in the post-War housing areas. Even though the two post-War housing areas offered several benches, most people were sitting in the streets in the pre-War housing areas.

The results from the static snapshots in Oosterwei area deviate from the other three cases in the way there are little differences on the amount of people moving in streets on weekdays and Sundays. Most of the people who sit and stand on streets are immigrant men and youngsters, mostly boys. In the other three areas there are more Europeans than non-Europeans in streets.

There are some functions located in the areas that function as attractors affecting the street life in the various neighbourhoods. Examples on attractors are public transport hubs, shops, restaurants, religious buildings (church, mosque), and community houses. The church function as an attractor only on Sundays, while the Mosque function as an attractor for only boys and men. These attractors can in some cases overrun the spatial layouts in the way it can affect street life in housing areas.

In general, it can be said that the neighbourhoods with a traditional street pattern generates a natural mix of inhabitants and visitors. Often shops are located along main routes going through the area. These main routes are frequented by local dwellers as well as dwellers from other neighbourhoods. The street life is thus generated through an integrated spatial pattern and direct connections between private and public space.

In post-War housing areas, the degree of street life is dependent on the location of attractors. Since the spatial segregated street pattern inside these areas generate a separation of various groups, attractors contributes to generate people on streets. The backside of the shops in post-War housing areas tends to have blind walls with no entrances and windows. This generate possibilities for anti-social behaviour of larger groups of youngsters due to a lack of natural surveillance from windows and random passing by's.

Since immigrants from various countries have their own behaviour pattern, they become more visible or present in post-War housing areas than in traditional urban areas. The segregated spatial layout contributes to a domination of men and boys with a Muslim background in the public spaces. Often the shaping of large groups generates to a frightening for women and girls to be on streets in these kinds of areas. In order to get an integrated lively cultural diversity in neighbourhoods, it can be supported by an integrated main route through the area in order to generate a natural mixture of people in streets with different cultural backgrounds, gender and age.

9. Conclusion

As the results from the case studies have shown, both the spatial parameters and the social composition of the dwellers influence the way people behave in streets. The chosen case studies represents four cases of slightly an extreme sort for the Netherlands. The next challenge is how the results from these case studies can be applied in urban planning and urban renewal.

In the first instance, the social composition of dwellers influence how people behave in streets. In the case of Ondiep in Utrecht, the social composition of dwellers has overrun the area's spatial parameters. In general, the area has high integration values on its streets, and most of the

dwelling have their entrances and windows directly connected to the streets. However, it does not help much when most of the dwellers are unemployed. Hence, a mixture of dwellers from various social and cultural backgrounds contributes to safer urban housing areas than dwellers from only the low-income class or only one group of immigrants with a same cultural background. When an area with an un-favourable spatial layout consists of dwellers with modal income, seemingly almost no vandalism and anti-social behaviour takes place.

Secondly, the ways in which dwellers behave, independent on their social background are spatially bounded. Human behaviour takes place in space, and the spatial layout shapes various kinds of opportunities for how people interact in streets. Various types of human beings search for different types of spaces. Youngsters seek spaces away from adults' surveillance, and unemployed seeks for possibilities in their direct vicinity to have some kind of social life. When an area does not offer an integrated main route through the area for generating naturally interaction between various types of people, then certain groups in society becomes very visible in the public spaces of an housing area. Hence, spatial segregation generates social segregation.

According to Jane Jacobs, a neighbourhood's degree of social safety is dependent on the degree of street life (Jacobs, 1961). However, degrees of street lives are dependent on the degree of variation and types of people in streets on different time periods of the day. In order to generate a large mix of people in streets in a natural and safe way, it can be spatially supported by integrated streets well connected to other neighbourhoods in the vicinity and that the street is constituted and visible by entrances and windows from adjacent buildings.

At present, several resources are made available by the Dutch government to make renewal of 40 problem-housing areas. In previous renewal projects, too many resources are spent on changing the building facades, street furniture and improving parks with a nice landscape design. Often it is believed that aesthetical solutions can stimulate to generate various types of people in a housing area's public spaces. However, aesthetical solutions on the problems do not help when it is not function properly. A group of youngsters gathering together in nicely designed built environments is scaring anyway. Hence, the spatial structure must be solved first, on a macro, meso as well as micro level.

When carrying out urban renewal on existing urban areas or when planning new housing areas, one has to first solve the underlying spatial structure on the street and road net. On a macro scale level, it is important to have one or more main routes through the area itself. A well connected network of main routes network connecting an area to its neighbouring areas will at least contribute to bring random through travellers through the area. Instead of separating the various modes of mobility means, a mixture of vehicles, bicycles and pedestrians contributes to generate street life. It will at least contribute to a natural mix of various people, locals as well as visitors, in the area itself. One of the problems in most post war housing areas is that the main routes tend to go between the urban areas instead of through them.

Moreover, on a meso scale level, if an area's local streets is well connected to the main routes, it will at least contribute to reduce an area's degree of spatial segregation and social isolation of certain kinds of groups. The side-streets are then visible from the main street, in which will increase inter-visibility between visitors and inhabitants.

On a micro scale level, a clearly defined street plinth by buildings located along streets contributes to social control between buildings and streets. Entrances directly connected to the streets and windows facing the street contributes to a natural surveillance mechanism between locals and visitors. In this way the problem of larger groups of youngsters gathering together will be reduced. When the ground floor is used as dwelling, shops or service functions instead of storage functions, it will generate a natural interaction between life inside buildings and street life. In many modern housing areas the ground floor is used as storage rooms for bicycles, garages etc. It reduces the degree of social control from buildings on streets and gives few possibilities for the random contact between neighbours. Furthermore, streets with blind walls contributes to opportunities for youngsters to gather uncontrolled together in large groups and that women and girls avoid frequenting public spaces.

When these various spatial parameters are solved, as far as it is possible, then one can start to “experiment” with aesthetical forms in the final design solutions. In addition, new to built areas as well as existing areas must offer a large variation in types of dwellings in various price classes in order to stimulate a large mix of dwellers with high, modal as well as low income. It can be difficult to implement a strategy of this kind in existing problem areas. No one dares to invest in a run-down area, when its reputation is already settled.

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