

# Pattern atlas

Dennis Groen

MSc thesis

June 2023

Creating safe space

---

## Creating safe space

Msc Thesis - Pattern atlas

Delft University of Technology  
Faculty of Architecture and the Built Environment  
Msc. Architecture, Urbanism and Building Sciences  
Department Urbanism

**Student:** Dennis Groen

**Student number:** 4558936

**Graduation studio:** Design of the Urban Fabric

**1st mentor:** Gerdy Verschuure-Stuip

**2nd mentor:** Els Bet

**Date:** 24-06-2023

## Preface

---

This pattern atlas is related to the report 'Creating safe space: enhancing neighborhood safety in Hillesluis, Rotterdam South, through spatial design', as part of the MSc thesis of the master track Urbanism at the TU Delft. This thesis is about improving the safety and livability of Rotterdam South, focusing on the Hillesluis neighborhood. The patterns in this atlas are design interventions applied to Hillesluis in the related thesis. However, these patterns can be used as a toolbox for improving safety in other neighborhoods, regardless of location. The thesis and this pattern atlas are focussing on spatial interventions to improve safety, and thus the patterns are mostly spatially related.

This atlas will first give a summary of the 'Creating safe space' report. After this, there will be an explanation of how to use this atlas. Then, an overview of the patterns will be shown before all patterns are addressed individually.

# Creating safe space

---

Several areas in the Netherlands are considered vulnerable. These areas have poor livability and safety. Creating safe space is about improving the perceived safety and livability in neighborhoods by designing spatial interventions.

In many cases, improving vulnerable neighborhoods involves gentrification; lower-income people are driven out of the neighborhood by higher-income classes. Creating safe space seeks a solution to improve the livability and safety of vulnerable neighborhoods without gentrification. To achieve this, the resident's perspective will be used. Being in contact with residents reveals the negative and positive aspects of the neighborhood. In addition, locations in the neighborhood will emerge that need improvement because here livability or safety is poor. In the 'Creating Safe Space' thesis, designs are created for the neighborhood Hillesluis which are based on patterns. These patterns are shown in this pattern atlas.

In the 'Creating safe space' report, six principles for improving safety and livability are used. These principles can be seen on the page to the right. Each pattern will contain a score representing how much the pattern relates to each principle.



## 1. Social cohesion

Social cohesion contributes to the feeling of safety. The design of public spaces and the presence of social amenities such as schools, stores, parks, community centers and playgrounds can promote interaction among residents and thus improve social cohesion (Wittebrood & van Dijk, 2007).

## 2. Attractivity

Attractivity contains of esthetical quality, diversity of functions, maintenance, and technical and social sustainability. However, attractivity is a difficult principle because it is a subjective term (Luten et al., 2008).

## 3. Connectivity

Connectivity can be both physical and social. This thesis will focus on the physical connections to other neighborhoods. Physical connections are containing all kinds of infrastructures (ICA, n.d.).

## 4. Accessibility

Accessibility contains the ability to get somewhere, but also the possibility to keep someone outside of something. Having control over encounters in public space is important here (Goossens, 2018).

## 5. Visibility

Two important factors of visibility are sightlines and lighting, which are contributing to the clarity of a neighborhood. Next to that, a mix of functions and frontdoors are important factors for natural surveillance (Luten et al., 2008).

## 6. Territoriality

Territoriality is about defining spaces. When there is a clear division of which space belong to who and how a space needs to be used, people feel more responsibility. This will contribute to safety (Dannenberg, 2011).

# How to use this atlas?

Pattern language is a tool that can help with design interventions, created by Christopher Alexander (1979). Pattern language can be designed in different ways, but the essence is to provide solutions with a theoretical foundation (van Dorst, 2005).

In this atlas, a pattern (fig. 1) consists of a short title (A) and a corresponding hypothesis (B). Each pattern has an icon (D) and a reference image (C) which provides a spatial image of the pattern. Each pattern is based on literature with a theoretical backup (E). In addition, the practical implication (G) is shown, with further explanation. The relationship with other patterns is also shown (F). Finally, each pattern has a score (H) regarding the aspects that contribute to a safe design: attractiveness, connectivity, accessibility, visibility, and territoriality. In addition, social cohesion has also been added, since some patterns are primarily socially related rather than spatially related.

In the related thesis, the pattern language is used to bridge the gap between research and design. The patterns in this atlas are reflected in the design locations. As a result, most of the design interventions in the related thesis are underpinned by literature.

- A Title
- B Hypothesis
- C Reference image
- D Icon
- E Theoretical backup
- F Relation to other patterns
- G Practical implication
- H Score

**A** 15 Transition public-private

**B** A less harsh transition between public and private will provide more social control.

**C** Reference image: Kersbergenstraat, Delft (own image).

**D** Icon: House with arrow pointing right.

**E** Theoretical backup: The transition between public and private can be softened by a small semi-open front yard, also called a hybrid zone. In this small area in front of the house, the resident can choose whether he or she feels the need to meet or not. Because the resident can control this, it creates a safer feeling (van Dorst, 2005). When this transition is very hard and the sidewalk is right next to the facade, people are also more likely to cover the windows (Blom & van Soomeren, 2013).

**F** Relation to other patterns:

- 04 Reducing car usage
- 09 Diversify typologies
- 11 Eyes on the street
- 16 Natural territoriality

**G** Practical implication: A front garden as a transition zone between private and public will contribute to social control. In addition, the streetscape will be less anonymous because people can control what their front garden looks like.

**H** Score:

Social cohesion	● ● ○ ○ ○
Attractivity	● ● ● ○ ○
Connectivity	○ ○ ○ ○ ○
Accessibility	○ ○ ○ ○ ○
Visibility	○ ○ ○ ○ ○
Territoriality	● ● ● ● ●

Fig. 1: Pattern example (By author)

# Patterns









---

An overview of all the patterns can be seen here. These are ordered from large scale to small scale. All patterns will be explained individually in the rest of this atlas.

## City scale


-  01 Public transport network 12
-  02 Connect 14

## Neighborhood scale

-  03 Participate 16
-  04 Bicycle network 18
-  05 Sports facilities 20
-  06 Diversify typologies 22
-  07 Versatile functions 24
-  08 Reducing car usage 26
-  09 Activating the waterfront 28
-  10 Squares 30

-  11 Community centers 32
-  12 Youth centers 34
-  13 Community garden 36

## Block / street scale

-  14 Safe crossings 38
-  15 Active street 40
-  16 Clean it up 42
-  17 Greenify streetscape 44

## Object scale

-  18 Eyes on the street 46
-  19 Transition public-private 48
-  20 Natural territoriality 50
-  21 Lighting 52
-  22 Permeable pavement 54
-  23 Seating space 56

# Pattern field

All the patterns of the pattern language can be organized by the extent of which they are concrete or abstract. Next to that, the different patterns are operating on different scale levels. These two distinctions can be seen on the two axes in figure 2.

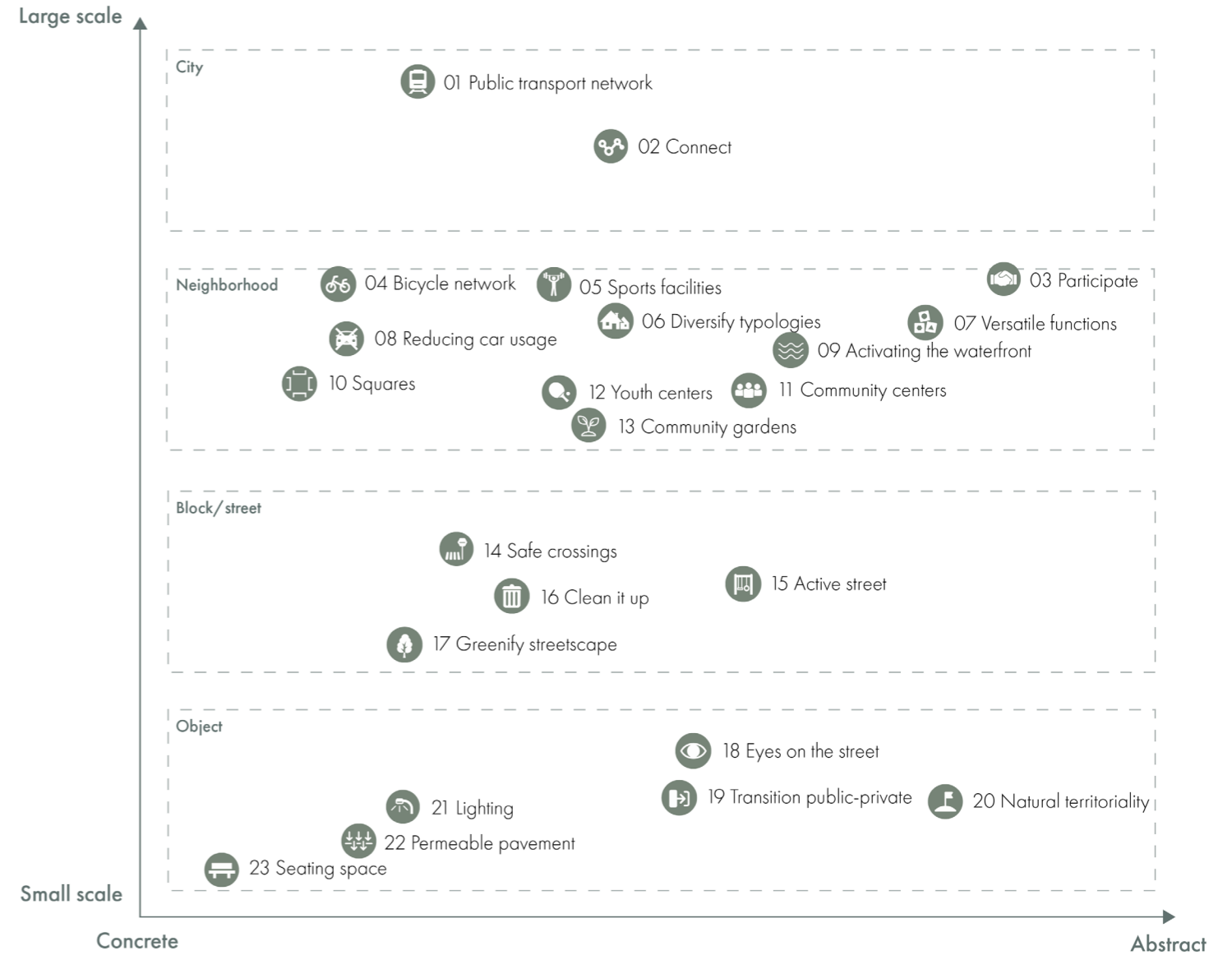


Fig. 2: Pattern field (By author)

# 01 Public transport network

Improving the public transport network will contribute to connecting people.



Reference: Public transport station (IPV Delft, 2022)



## Theoretical backup

Public transport can counter the isolation of people, especially for the elderly. When there is a good public transport network and the elderly do not live too far from a public transport stop, they are more likely to connect with other people. Next to that, a good public transport network reduces car use (Michael et al., 2006).

## Practical implication

Because public transport stops are closer, there will be fewer long distances to walk. Especially at night, this will make people feel safer. In addition, the car will become less important and less space in the streets will need to be reserved for cars. This can improve the quality of public space.

## Relation to other patterns

- 02 Connect
- 04 Bicycle network
- 08 Reducing car usage
- 18 Eyes on the street
- 21 Lighting

## Score

Social cohesion	●	●	○	○	○
Attractivity	●	●	○	○	○
Connectivity	●	●	●	●	●
Accessibility	●	●	●	●	○
Visibility	●	○	○	○	○
Territoriality	●	○	○	○	○

## 02 Connect

Connecting the neighborhood to its surroundings creates more vibrancy.



Reference: Westersingel Rotterdam (own image)



### Theoretical backup

Improving the connectivity of a neighborhood will prevent the neighborhood from being isolated from other neighborhoods. A better connection from the surroundings to the neighborhood itself also creates more activity in the neighborhood. In addition, relationships can be established with surrounding neighborhoods and their communities, which can benefit one's own neighborhood (ICA, n.d.).

### Relation to other patterns

- 01 Public transport network
- 04 Bicycle network
- 09 Activating the waterfront
- 14 Safe crossings
- 18 Eyes on the street
- 21 Lighting

### Practical implication

The connections are mainly aimed at slow traffic and public transport. For example, bridges for pedestrians and cyclists can help reduce barriers.

### Score

Social cohesion	●	●	○	○	○
Attractivity	●	●	○	○	○
Connectivity	●	●	●	●	●
Accessibility	●	●	●	●	●
Visibility	●	○	○	○	○
Territoriality	●	○	○	○	○



# 03 Participate

Participation of inhabitants will help improve neighborhoods more efficiently.



Reference: Inhabitant participation (De Ruig, n.d.)



## Theoretical backup

Resident participation has economic, organizational and communication benefits. One explanation for this is that residents are often co-responsible for the problems related to the living environment and thus the livability in the neighborhood. Allowing residents to have a say in their neighborhood will also create support. The policy must be open and transparent so that each party can see what is going on. As a result, problems can be solved more effectively (Veen, 2010).

## Practical implication

Resident participation can be used as a tool to find out places in a neighborhood that residents consider to be less or where they feel unsafe. This allows these problem places to be improved effectively.

## Relation to other patterns

-  05 Sports facilities
-  11 Community centers
-  12 Youth centers

## Score

Social cohesion	● ● ● ● ○
Attractivity	● ○ ○ ○ ○
Connectivity	● ○ ○ ○ ○
Accessibility	● ○ ○ ○ ○
Visibility	● ○ ○ ○ ○
Territoriality	● ○ ○ ○ ○

# 04 Bicycle network

Improving the bicycle network will contribute to both physical and social safety.



Reference: Gemeente Den Haag (2023)



## Theoretical backup

There is a strong relationship between the presence of good infrastructure for cyclists and pedestrians and safety in a neighborhood. Here there is a relationship with both physical safety and social safety. A safe environment invites walking or cycling and vice versa. Next to that, a good cyclist and pedestrian infrastructure will discourage the usage of cars (Alleman et. al, 2005).

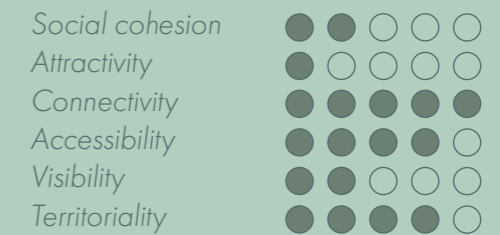
## Relation to other patterns

- 01 Public transport network
- 02 Connect
- 08 Reducing car usage
- 17 Greenify streetscape
- 20 Natural territoriality

## Practical implication

Improving the bicycle network will also improve traffic safety. Neighborhoods will be less car-oriented because bicycle facilities are improved. Having less space for cars frees up space for making streets more attractive, for example by adding green.

## Score



# 05 Sports facilities

Sports facilities are one of the most important social catalysts of a neighborhood.



Reference: Calisthenics park (Weekblad Voor Ouder Amstel, 2022)



## Theoretical backup

Practicing sports provides a lot of social interaction and thus contributes greatly to the livability of a neighborhood. By reducing the distance to sports clubs, more people will participate (Boonstra & Hermens, 2011).

## Practical implication

Both indoor and outdoor sports facilities can contribute to social cohesion in a neighborhood. Next to that, In addition, both public sports facilities and specific sports associations contribute to the social sports network. A suitable place for public sports facilities is in a neighborhood square. By having enough seating areas around the sports facilities, even people who do not want to or cannot participate in sports themselves can watch.

## Relation to other patterns

- 07 Versatile functions
- 10 Squares
- 15 Active street
- 23 Seating space

## Score

Social cohesion	● ● ● ● ●
Attractivity	● ● ● ○ ○
Connectivity	○ ○ ○ ○ ○
Accessibility	● ○ ○ ○ ○
Visibility	● ● ○ ○ ○
Territoriality	○ ○ ○ ○ ○

# 06 Diversify typologies

Diversifying typologies in a neighborhood will retain inhabitants.






Reference: Maisonette housing (De Nieuwe Veiling, n.d.)



## Theoretical backup

By adding typologies, the urgency for people to move to another neighborhood can be reduced. This will allow people to stay longer in their neighborhood, partly because they can continue to grow in their neighborhood, by for example moving to a bigger house. If people stay in the same neighborhood for an extended time, they will know more and more people. This contributes to the social cohesion and feeling of safety in a neighborhood (Ulusoy, 2012).

## Relation to other patterns

-  08 Reducing car usage
-  18 Eyes on the street
-  19 Transition public-private

## Practical implication

New typologies can additionally take into account other aspects related to safety, such as front doors facing the street and a good transition between public and private spaces. Also, building blocks with parking inside the building block can be added.

## Score

Social cohesion	●	○	○	○	○
Attractivity	●	●	●	●	○
Connectivity	○	○	○	○	○
Accessibility	○	○	○	○	○
Visibility	●	●	●	○	○
Territoriality	●	●	●	○	○

# 07 Versatile functions

Having functions for different groups next to each other will contribute to vibrancy.



Reference: Urban square with versatile functions (Landezine, n.d.)







## Theoretical backup

Function mix in a neighborhood will contribute to safety and livability. Function mix ensures that different people are present in an area throughout the day. In addition, function mixing also allows different types of people to use an area, which can provide social interaction between different groups (Wittebrood & van Dijk, 2007).

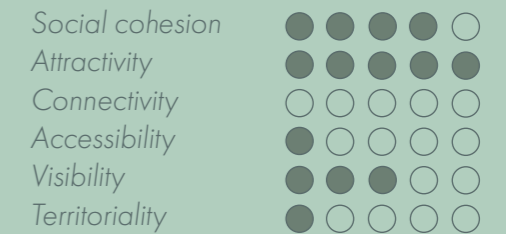
## Practical implication

The mix of functions refers to both the mix of functions of buildings and public spaces. A public space, such as a square, should be designed so that different types of groups of people can use it. As a result, the place does not feel owned by one type of group, which contributes to the feeling of safety.

## Relation to other patterns

-  05 Sports facilities
-  10 Squares
-  13 Community garden
-  15 Active street
-  18 Eyes on the street
-  21 Street lighting
-  23 Seating space

## Score



# 08 Reducing car usage

Reducing on-street parking and car use will improve streets and its visibility.



Reference: Street in Amsterdam without parking (Autoluw NUI, 2023)



## Theoretical backup

Parking on both sides of a street creates a lack of visibility. When parking on one or both sides is removed, visibility in a street improves (Dannenberg, 2011). In addition, the freed-up space from the removed parking spaces can be used for greenery. The addition of greenery increases the quality of life and contributes to interaction (Van Dorst, 2005).

## Practical implication

The freed-up space from the removed parking spaces can be used in various ways. In addition to adding green space, there is now more room for adding front gardens, small playgrounds, and bicycle parking.

## Relation to other patterns

- 01 Public transport network
- 06 Diversify typologies
- 10 Squares
- 15 Active street
- 17 Greenify streetscape
- 18 Eyes on the street
- 19 Transition public-private
- 20 Natural territoriality
- 22 Permeable pavement
- 23 Seating space

## Score



# 09 Activating the waterfront

Making the waterfront accessible will create more attractive pedestrian routes.



Reference: Lange Hilleweg, Rotterdam (own image)






## Theoretical backup

A waterfront can be an important catalyst for urban development. Using the waterfront can create a unique atmosphere in the city. It can also contribute to social and economic development (Timmerman, 2011).

## Practical implication

The new accessible waterfronts can go along with new pedestrian bridges in the area. This will give the pedestrian in the area as many options as possible, which will contribute to activity in the neighborhood.

## Relation to other patterns

-  02 Connect
-  15 Active street
-  21 Lighting
-  23 Seating space

## Score

Social cohesion	●	○	○	○	○
Attractivity	●	●	●	●	○
Connectivity	●	●	●	●	○
Accessibility	●	●	●	●	●
Visibility	●	○	○	○	○
Territoriality	●	●	●	○	○

# 10 Squares

Squares in a neighborhood will contribute to social cohesion.



Reference: Square for activities and interaction (Landezine, n.d.)



## Theoretical backup

Public squares have environmental, economic, and social benefits. Squares are places that trigger interaction among people. In addition, social control, equality, and territoriality are important for social cohesion and thus for a square (Cohesion, 2018).

## Practical implication

Squares can be applied at different scales. For example, there can be very large neighborhood squares or smaller street squares. This depends on the task and the goal which needs to be achieved.

## Relation to other patterns

- 04 Bicycle network
- 05 Sports facilities
- 07 Versatile functions
- 08 Reducing car usage
- 12 Youth centers
- 13 Community garden
- 15 Active street
- 16 Clean it up
- 17 Greenify streetscape
- 18 Eyes on the street
- 19 Transition private-public
- 21 Street lighting
- 22 Permeable pavement
- 23 Seating space

## Score

- Social cohesion ● ● ● ● ○
- Attractivity ● ● ● ○ ○
- Connectivity ● ○ ○ ○ ○
- Accessibility ● ● ● ○ ○
- Visibility ● ● ● ○ ○
- Territoriality ● ● ○ ○ ○



# 11 Community centers

Community centers for different target groups will contribute to social cohesion.



Reference: Community center De Mussen (Dorlo, 2020)



## Theoretical backup

Community centers are places where interaction between people from different groups can take place. This can be a basis for community resilience in a neighborhood (Hoijtink et al., 2020). When people know more people in their neighborhood, they feel safer (Wittebrood & van Dijk, 2007).

## Practical implication

Neighborhood centers can be used primarily in central locations in the neighborhood, such as around squares. Neighborhood centers can also be used for resident participation or indoor youth facilities.

## Relation to other patterns

- 03 Participate
- 07 Versatile functions
- 08 Youth centers
- 10 Squares

## Score

Social cohesion	● ● ● ● ●
Attractivity	● ○ ○ ○ ○
Connectivity	○ ○ ○ ○ ○
Accessibility	● ○ ○ ○ ○
Visibility	● ○ ○ ○ ○
Territoriality	● ○ ○ ○ ○

# 12 Youth centers

Youth centers will keep youth from the streets and reduce nuisance.



Reference: Youth center London (Omer, 2023)



## Theoretical backup

Youth centers are places where young people can meet with each other with a roof over their heads. This keeps young people off the streets, which can reduce nuisance. The youth center can host a variety of activities. In addition, a youth center can also be a means of giving a voice to the youth in the neighborhood and getting more connected with them (Zuurmond et al., 2012).

## Practical implication

Indoor facilities for youth can also be combined with community centers. Suitable places for this are places with a lot of activity, such as squares.

## Relation to other patterns

- 03 Participate
- 07 Versatile functions
- 10 Squares
- 11 Community centers

## Score

- Social cohesion ●●●●●●
- Attractivity ●○●○●○
- Connectivity ○○●○●○
- Accessibility ●○●○●○
- Visibility ●○●○●○
- Territoriality ●●●○●○

# 13 Community garden

Using community gardens will have economic, ecological and social benefits.



Reference: Community garden (City of Fremantle, n.d.)



## Theoretical backup

A community garden is a green space between buildings that is collectively designed, used by residents, and where there is room for self-management. By designing together, everyone can identify with the garden and there is a shared sense of responsibility for the community garden. Community gardens provide various economic, ecological, and social benefits for urban residents. Community gardens will contribute to social cohesion (Rogge et al., 2018).

## Practical implication

Community gardens can be placed in several places. A small neighborhood square is a very suitable place. Another option is inside a building block, for example on top of a parking garage.

## Relation to other patterns

-  07 Versatile functions
-  15 Active street
-  17 Greenify streetscape
-  18 Eyes on the street

## Score

Social cohesion	●	●	●	●	●
Attractivity	●	●	●	○	○
Connectivity	○	○	○	○	○
Accessibility	●	○	○	○	○
Visibility	●	○	○	○	○
Territoriality	●	○	○	○	○

# 14 Safe crossings

Safe crossing points will improve the public space network and activity on streets.





Reference: Safe crossing Oosterbeek (Bruinsma, 2018)



## Theoretical backup

When a neighborhood is well connected to its surroundings, the activity will be influenced positively. By making safe crossing points for pedestrians this connection can be improved. Safe crossing points inside the neighborhood also improve the connection between the different parts of the neighborhood itself (ICA, n.d.).

## Relation to other patterns

-  02 Connect
-  20 Natural territoriality

## Practical implication

Next to the improvement of the connections the safe crossings will also contribute to the traffic safety of the neighborhood. In addition, it can also cause cars to move through the neighborhood at a slower speed because there are more points to stop at.

## Score

Social cohesion	● ● ○ ○ ○
Attractivity	● ○ ○ ○ ○
Connectivity	● ● ● ● ○
Accessibility	● ● ● ● ○
Visibility	● ○ ○ ○ ○
Territoriality	● ● ● ○ ○

# 15 Active street

More possibilities for activities on the street such as playgrounds provides more activity.



Reference: A street with playing facilities (Omer, 2023)



## Theoretical backup

Outdoor activities are an important aspect that contributes to the quality of public space. These activities can involve sports activities or playing activities. A passive activity, watching other people, also contributes to the quality of public space. When there are more options for activities, space becomes more used. In this way, there will be more eyes on the street (Van Dorst, 2005).

## Practical implication

When people want to watch other people who are engaged in an activity, having enough places to sit is also important. These activities can take place in squares, but also in streets.

## Relation to other patterns

- 04 Reducing car usage
- 05 Sports facilities
- 07 Versatile functions
- 10 Squares
- 18 Eyes on the street
- 21 Street lighting
- 22 Permeable pavement

## Score

Social cohesion	● ● ● ● ●
Attractivity	● ● ● ● ○
Connectivity	○ ○ ○ ○ ○
Accessibility	● ○ ○ ○ ○
Visibility	● ● ● ● ○
Territoriality	● ○ ○ ○ ○

# 16 Clean it up

A clean neighborhood will have a positive influence on public space and its activity.



Reference: Schoon, doen we toch gewoon (2023)



## Theoretical backup

A clean living environment is important for a lot of people. In most cases, a cleaner neighborhood is also a safer neighborhood. If residents keep a neighborhood clean by themselves, this provides more social interaction. In addition, more children play in a clean street (Luten, 2008).


## Practical implication

There should be more places in a neighborhood where trash can be disposed of. A good location for this is in a neighborhood square, but in streets is also a good option. A cleaner street can also in turn increase residents' sense of responsibility to keep the street as clean as it is.

## Relation to other patterns

-  10 Squares
-  17 Greenify streetscape
-  20 Natural territoriality

## Score

- Social cohesion 
- Attractivity 
- Connectivity 
- Accessibility 
- Visibility 
- Territoriality 

# 17 Greenify streetscape

Greenifying the streetscape contributes to the quality of the living environment.



Reference: Green street Delfshaven (Milou, 2022)



## Theoretical backup

By improving public spaces, residents become more connected to the neighborhood (Beckhoven & Kempen, 2002). Public space can be improved by adding greenery. Greenery contributes, among other things, to residential enjoyment, health, good air quality, biodiversity, climate adaptation, and recreational opportunities (Bekhuis et. al, 2021).

## Practical implication

The current streetscape consists of a lot of paving and parking. This creates a lot of anonymity and, as a result, the streets are not a place to stay. By adding greenery, residents will find it more pleasant to stay in the street and the street will no longer be anonymous. This will also provide more interaction between residents.

## Relation to other patterns

- 04 Bicycle network
- 07 Community garden
- 10 Squares
- 16 Clean it up
- 18 Eyes on the street
- 19 Transition public-private
- 20 Natural territoriality 22 permeable pavement

## Score

Social cohesion	● ● ○ ○ ○
Attractivity	● ● ● ● ●
Connectivity	○ ○ ○ ○ ○
Accessibility	○ ○ ○ ○ ○
Visibility	● ○ ○ ○ ○
Territoriality	● ○ ○ ○ ○

# 18 Eyes on the street

A lot of front doors on the street side will provide social control.



Reference: Frontdoors Rotterdam (The City at Eye Level, 2021)



## Theoretical backup

First-floor housing is important for eyes on the street. The plinth forms the connection between a house and the city. However, it is not convenient if the front door is directly adjacent to the street. This makes people more likely to cover their windows and doors to prevent people from looking into their houses. A small transition zone is a solution for this (Blom & van Soomeren, 2015).

## Practical implication

Several typologies have no front doors facing the street, for example porch housing. Because all residents enter their homes through porches, there are no front doors adjacent to the street, which is not good for the eyes on the street. These homes can be modified on the ground floor so that front doors face the street.

## Relation to other patterns

- 01 Public transport network
- 08 Reducing car usage
- 06 Diversify typologies
- 07 Versatile functions
- 19 Transition public-private
- 20 Natural territoriality
- 23 Seating space

## Score

Social cohesion	● ● ○ ○ ○
Attractivity	● ○ ○ ○ ○
Connectivity	○ ○ ○ ○ ○
Accessibility	○ ○ ○ ○ ○
Visibility	● ● ● ● ●
Territoriality	● ● ● ○ ○



# 19 Transition public-private

A less harsh transition between public and private will provide more social control.



Reference: Kersbergenstraat, Delft (own image)



## Theoretical backup

The transition between public and private can be softened by a small semi-open front yard, also called a hybrid zone. In this small area in front of the house, the resident can choose whether he or she feels the need to meet or not. Because the resident can control this, it creates a safer feeling (van Dorst, 2005). When this transition is very hard and the sidewalk is right next to the facade, people are also more likely to cover the windows (Blom & van Soomeren, 2015).

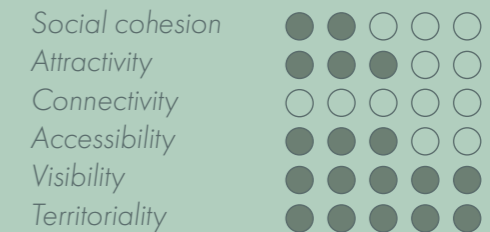
## Practical implication

A front garden as a transition zone between private and public will contribute to social control. In addition, the streetscape will be less anonymous because people can control what their front garden looks like. It also creates a sense of responsibility.

## Relation to other patterns

- 06 Diversify typologies
- 08 Reducing car usage
- 18 Eyes on the street
- 20 Natural territoriality

## Score



# 20 Natural territoriality

A natural territoriality makes it more pleasant to use a public space.









Reference: Duurzaam Den Haag (2023)



## Theoretical backup

Natural territoriality provides clarity on how public space should be used. There is clarity about who belongs where in the public space. When this territoriality is lacking, it is less pleasant for people to use public spaces. As a result, this public space will contain less activity. Less activity in the outdoor space also means fewer eyes on the street and thus less visibility (Dannenberg, 2011).

## Relation to other patterns

-  08 Reducing car usage
-  14 Safe crossings
-  16 Clean it up
-  18 Eyes on the street
-  19 Transition private-public space
-  21 Street lighting

## Practical implication

This natural territoriality can be reflected in clearly having owners of front gardens. In addition, this territoriality can also occur through clear places to park bikes and cars on the street.

## Score



# 21 Lighting

Streetlighting improves visibility in a neighborhood.



Reference: Streetlighting IJsselmonde (Dagblad 010, 2021)



## Theoretical backup

Residents' sense of safety increases as street lighting greatly improves visibility. In addition, street lighting reduces crime. This crime is not only reduced at night but also during the day (Pease, 1999).

## Practical implication

Streetlighting improves visibility at times when it's dark. There often is room for improvement in terms of lighting in places such as viaducts and parks.

## Relation to other patterns

- 01 Public transport network
- 09 Activating the waterfront
- 10 Squares
- 19 Eyes on the street

## Score

Social cohesion	●	●	○	○	○
Attractivity	●	○	○	○	○
Connectivity	○	○	○	○	○
Accessibility	○	○	○	○	○
Visibility	●	●	●	●	●
Territoriality	●	●	○	○	○

# 22 Permeable pavement

Permeable pavement will improve the quality of public space.



Reference: Permeable pavement in parking spots (Geall, 2023)



## Theoretical backup

Permeable pavement is semi-open paving with greenery in between. A major advantage is that rainwater can sink between the paving. In addition, it also helps reduce the Urban Heat Island effect. Permeable pavement creates a greener streetscape. A greener streetscape is a more attractive streetscape, which means more people will use the outdoor space. This contributes to social cohesion. (Bouw Natuurinclusief, n.d.).

## Practical implication

Permeable pavement can be a difficult surface for people who are mobility impaired or in wheelchairs. Therefore, easily walkable routes must be always available. Good places for permeable pavement are places that are not part of a main walking route, such as parking lots or streetcar tracks.

## Relation to other patterns

- 08 Reducing car usage
- 10 Squares
- 15 Active street
- 17 Greenify streetscape

## Score

- Social cohesion ● ● ● ○ ○
- Attractivity ● ● ● ● ○
- Connectivity ○ ○ ○ ○ ○
- Accessibility ○ ○ ○ ○ ○
- Visibility ○ ○ ○ ○ ○
- Territoriality ● ○ ○ ○ ○

# 23 Seating space

Seating spots in public space will provide interaction between people.



Reference: Seating options in public space (Gigl, 2020)



## Theoretical backup

An important aspect that contributes to the quality of public space is seating options (Van Dorst, 2005). Seating areas are places that allow people to spend an extended period in a particular public space. This also allows more people to be active in the outdoor space, which attracts even more people (Mehta & Bosson, 2010).

## Practical implication

Seating areas can be combined with adding greenery. This can be done in squares as well as in streets. By adding quality in public space, there is more opportunity for interaction. This interaction, in turn, can provide more social cohesion.

## Relation to other patterns

-  05 Sports facilities
-  07 Versatile functions
-  09 Activating the waterfront
-  17 Greenify streetscape
-  19 Eyes on the street
-  20 Natural territoriality
-  21 Street lighting

## Score

Social cohesion	● ● ● ● ○
Attractivity	● ● ● ● ○
Connectivity	○ ○ ○ ○ ○
Accessibility	○ ○ ○ ○ ○
Visibility	● ● ○ ○ ○
Territoriality	● ○ ○ ○ ○

# Sources

---

Alexander, Chr., S. Ishikawa, M. Silverstein with M. Jacobson, I. Fiksdahl-King and S. Angel (1977). *A Pattern Language*. New York: Oxford University Press

Alleman, T. A., Storm, I., & Penris, M. J. E. (2005). *Beweging en veiligheid in de wijk*-Handleiding'bewegingsbevorderende en veilige wijken'. RIVM rapport 270014001.

Autoluw NU! (2023, February 1). *Ideeën voor minder parkeren en meer leefruimte*. Retrieved 2023, May 5, from <https://www.autoluw.nu/ideeen-voor-minder-parkeren-en-meer-leefruimte/>

Beckhoven, E. V., & Kempen, R. V. (2002). *Het belang van de buurt. De invloed van herstructurering op activiteiten van blijvers en nieuwkomers in een Amsterdamse en Utrechtse buurt*

Bekhuis, F. (2021). *Duurzaam groen moet je doen: samenwerken aan een integrale aanpak voor een duurzame groene leefomgeving*. CROW

Blom, S., & van Soomeren, P. (2015, September 20). *Ontmoeten als keuze: Succesfactoren voor gemengd wonen*.

Boonstra, N., & Hermens, N. (2011). *Veilig sporten in de buurt. Vier jaar onderzoek naar*.

Bouw Natuurinclusief (n.d.). *Halfbestrating houdt ruimte groen*. Retrieved June 13, 2023, from <https://bouwnatuurinclusief.nl/blogs/halfbestrating-houdt-ruimte-groen>

Bruinsma, J. (2018). *Slimme oversteek op schoolroute Oosterbeek, nog zes op verlanglijst*. Retrieved, June 9, from: <https://www.gelderlander.nl/arnhem/slimme-oversteek-op-schoolroute-oosterbeek-nog-zes-op-verlanglijst-aaec0b63/>

City of Fremantle. (n.d.). *Community gardens*. Retrieved 2023, May, 16, from <https://www.fremantle.wa.gov.au/residents/trees-and-verges/community-gardens>

Cohesion, S. S., & Steinkellner, A. (2018). *Thinking Beyond the Square-*.

Dagblad010 (2021, April 29). *Rotterdam vervangt lantaarnpalen voor LED in IJsselmonde*. <https://dagblad010.nl/ijssemondenieuws/rotterdam-vervangt-lantaarnpalen-voor-led-in-ijssemonde>

Dannenberg, A. M. (2011). *Verschillende perspectieven op fysieke maatregelen om onveiligheid tegen te gaan. Een casestudie in het'onveilige'Oude Westen van Rotterdam* (Master's thesis).

De Nieuwe Veiling, (n.d.). Retrieved 2023, May 16, from <https://www.nieuwbouw-denieuweveiling.nl/woningen/maisonette-woningtype-a077R00001QJrDiQAL/bouwnummer-068>

De Ruig, S. *Effectieve bewonersparticipatie blijft zoektocht* – Kennisplatform Corpovenista. (z.d.). <https://www.corpovenista.nl/nieuws/uitgelicht/effectieve-participatie-blijft-zoektocht/>

Duurzaam Den Haag. (2023, June 6). *Eerste fiets/boomvlonder geplaatst: Meer ruimte voor fiets en groen*. <https://duurzaamdenhaag.nl/nieuws-tips/eerste-fiets-boomvlonder-geplaatst-meer-ruimte-voor-fiets-en-groen>

Gemeente Den Haag (2023). *Kranenburgweg plan*. Retrieved, July 12, 2023, from <https://bereikbarestad.denhaag.nl/werkzaamheden/herinrichting-kranenburgweg/kranenburgweg-plan/>

Geall, M. (2023). *These 'permeable pavements' are full of tiny holes — and they might be one of the secrets to preventing flash floods*. The Cool Down. <https://www.thecooldown.com/green-tech/permeable-pavement-flood-urban-area-temperature/>

Gigl, E. (2020). *Thinking Urban: Furniture & Public Spaces for People*. ArchiExpo e-Magazine. <https://emag.archiexpo.com/thinking-urban-furniture-public-spaces-for-people/>

Goossens, M. *Criminaliteitspreventie en stedelijk design. Gedrag () en Ruimte, 99*.

ICA home page. (z.d.). *The International Crime Prevention Through Environmental Design Association*. Geraadpleegd op 17 januari 2023, van <https://cpted.net/>

IPV Delft. (2022, November 10). *passerelle Zwolle*. Retrieved May 16, 2023, from <https://ipvdelft.nl/portfolio-item/passerelle-zwolle/>

Landezine. (n.d.). *A'Beckett Urban Square*. Retrieved 2023, May, 8, from <https://landezine.com/abeckett-urban-square/>

Luten, I., Lopez, M., Woldendorp, T. & van Zwam, C. 2008. Handboek veilig ontwerp en beheer, sociale veiligheid in ruimte, gebouwen en woningen. Bussum, THOTH

Mehta, V., & Bosson, J. K. (2010). Third places and the social life of streets. *Environment and behavior*, 42(6), 779-805.

Michael, Y. L., Green, M. K., & Farquhar, S. A. (2006). Neighborhood design and active aging. *Health & place*, 12(4), 734-740.

Milou. (2022, 15 mei). *Zo maak je een geveltuin in jouw stad*. VanafHier. <https://www.vanafhier.nl/natuur/zo-maak-je-een-geveltuin-jouw-stad>

Oliviera, G. (2015, August). *Gevoelens van onveiligheid in een veilige buurt: Een kwantitatief onderzoek naar de oorzaken van onveiligheidsgevoelens in Rotterdam*.

Omer, N. (2023, April 27). *Thursday briefing: Could a new plan to tackle the causes of crime help protect vulnerable youth?* *The Guardian*. <https://www.theguardian.com/world/2023/apr/27/thursday-briefing-could-a-new-plan-to-tackle-the-causes-of-help-protect-vulnerable-youth>

Pease, K. (1999). *A review of street lighting evaluations: Crime reduction effects*. *Crime prevention studies*, 10(1), 47-76.

Rogge, N., Theesfeld, I., & Strassner, C. (2018). *Social Sustainability through Social Interaction—A National Survey on Community Gardens in Germany*. MDPI. Retrieved October 11, 2022, from <https://www.mdpi.com/2071-1050/10/4/1085>

Schoon, doen we toch gewoon (2023, February 21). Retrieved, June 6, from: <https://www.schoondoengewoon.nl/>

The City at Eye Level (2021). *Hybrid zones make streets personal*. <https://thecityateyelevel.com/stories/hybrid-zones-make-streets-personal/>

Timmerman, H. (2011). *Revitaliseren van de oude haven van Antwerpen: De Schelde integreren en verbinden met de binnenstad door gebruik van de oude havengebieden*.

Ulusoy, D. (2012). *Nieuwe woningtypes als wapen tegen de stadsvlucht*. *AGORA Magazine*, 28(5).

Van Dorst, M. 2005. *Een duurzaam leefbare woonomgeving: fysieke voorwaarden voor privacyregulering*, Delft, Eburon Uitgeverij BV.

Veen, M. T. J. (2010, August). *Bewonersparticipatie de sleutel tot succes?*

Weekblad voor Ouder Amstel (2022, November 29). *Calisthenics park officieel geopend*. | Nieuws uit de regio Ouder Amstel. <https://www.weekbladvoorouderamstel.nl/lokaal/overig/880030/calisthenics-park-officieel-geopend>

Wittebrood, K. & van Dijk, T (juli 2007): *Aandacht voor de Wijk: Effecten van herstructurering op de leefbaarheid en veiligheid op de leefbaarheid en veiligheid*.

Zuurmond, M. A., Geary, R. S., & Ross, D. A. (2012). *The effectiveness of youth centers in increasing use of sexual and reproductive health services: a systematic review*. *Studies in family planning*, 43(4), 239-254.

