



RESEARCH PAPER (DRAFT)

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ADAPTING 20TH-CENTURY HERITAGE

# HOW THE ARCHITECTURAL ELEMENTS OF A MALL INFLUENCE ITS USERS

## Introduction

Malls in the Netherlands have been successful for years. The Lijnbaan in Rotterdam, completed in 1953, is the most well-known example of a mall to separate pedestrian from vehicular traffic. The concept proved successful, thus it was implemented in the design of many new malls in the second half of the twentieth century. Some malls stood the test of time better than others, but overall, many of these malls thrived financially. However, the financial crisis of 2008 gave an abrupt end to this success (Ossokina et al., 2016, p. 4). The rising trend of online shopping complicated the financial recovery of shop owners and with the recent COVID-crisis amplifying this trend (Eerenbeemt, 2021), the vacancy in malls is still a problem to this day.

Malls are often designed with the commercial aspect as a priority, with architectural aspects like sight lines, resting areas, width and height, routing and location as important parameters (Kroot, 1993, p.16). However, the way to commercial success on which the execution of these elements is based, was present at the time, but with the changing consumer behaviour (Organisatie Groep Zuid, 2017, p. 8) and the diversification of functions in and around malls like De Boogaard in Rijswijk (Eerenbeemt, 2021) the execution of these aspects should be re-evaluated.

## Problem statement and research questions

This research will focus on the design of public space in 'modern' malls. Malls can be indoor and outdoor and the pedestrian areas are often not officially public. However, the focus of this research will in fact be on the space outside the stores themselves. As the results of this research are intended to be used on the transformation of an existing mall, the elements that are discussed, will eventually be used as interventions. In order to decide what interventions are needed, a set of elements must be defined, so the characteristics and consequences of these elements can be found.

The problem is that the spatial design of malls is outdated, it was designed around the customer behaviour at the time of the design or the latest redesign. Whereas in the past people went to a mall to consume, nowadays their goals are much more diverse. If a redesign of a modern mall is made, this changed behaviour should be taken into account. The strategic placement of architectural elements, based on the criteria formed in this research, could be a way to make sure the redesign suits this new behaviour.

Many of these elements are present in existing malls, therefore the different outcomes of executions can be compared. This research will investigate current user behaviour and how it is affected by architectural elements. Therefore, the main research question is *What is the influence of architectural elements of a mall on its users?* The answer to this question can be found by answering two sub-questions: *What is environmental behaviour?; How do architectural elements influence environmental behaviour?* After answering these questions, for each element, a set of recommendations or criteria can be formed, instructing designers on how to use each element in a specific location, with a certain goal in mind. The redesign of Winkelcentrum Woensel can act as an example, showing how these recommendations can be integrated into the design process.

## Theoretical framework

As this research is twofold – it explores architectural elements on the one hand and environmental behaviour on the other – a combination of various publications is used.

### *Architectural elements*

For the enumeration and valuation of architectural elements, one could read Jan Gehl's *Cities for People* (2010), a plea for city planning on a human scale. The book explores methods and tools used by Gehl to reconfigure unworkable cityscapes into the landscapes he believes they should be. The ultimate result of this is a toolbox presented at the end of the book, presenting key principles, methods and keywords, which could well form an example for this research's goal. Another book which will be used is *Elements of Architecture* by Rem Koolhaas (2014). Koolhaas reveals essential design techniques, by discussing the fundamentals of buildings and how they change over time. It discusses concrete examples like windows, corridors and stairs, this concretisation is helpful for the goal of this research. The problem with these two books, is that they discuss urban planning (in the case of Gehl) and architecture (Koolhaas), whereas the design of a mall is arguably somewhere in between or at least a combination of both. In a mall, it is difficult to define what is outside and inside, what is public and private and where the building becomes the city. Therefore, the first part of this research is targeted at defining the key architectural elements of a mall. As time is limited, not all elements have been defined, but a set of elements is named, based on observability and relevance to the redesign for which this research will be used. The research can be extended over time, with the addition of new elements and new observations.

**Floor:** The floor, a "lower horizontal surface of any space (in a building) including finishes that are laid as part of the permanent construction" (Floor definition, n.d.) is an element with which the user is almost always in contact. However, the user is often not consciously aware of the floor and it has "often been seen as an inert supporting layer to the vertical" (Koolhaas, p. 6). Despite the lack of awareness by the user, floors present itself as an opportunity influence and guide its user and might be used as "an expressive software for space with enormous powers to shape building morphology" (Koolhaas, p. 7). When speaking about the floor – or pavements, as Gehl speaks about floors in public space - Gehl only refers to demands for comfort and accessibility, saying floors should be flat and non-slip. He does not describe the effects of materials, colours or patterns.

**Stairs:** As "a pedestrian route between different vertical levels" made by a "division of the height between levels into manageable steps" (Stair design, n.d.), stairs allow for ascent and descent, but also could pose as a barrier. Gehl argues that this barrier is both physical and psychological and that people prefer a ramp or escalator over stairs when given the opportunity to choose. Part of this barrier is formed by being able to see the top of the staircase as it might look seemingly endless. He proposes dividing the climb into shorter segments, where the climber never gets the chance to see the entire course of the stairs. Concluding, he says stairs should be considered genuine obstacles and should be avoided wherever possible. If they are a necessity, stairs and steps "must have comfortable dimensions and visual interest". Koolhaas presents theoretical information on the formula for stair inclination. However, he does not say anything about stairs in public domain or stairs that are more flat than the standard inclination derived from the formula.

Canopy: "A canopy is an overhead roof structure that has open sides. Canopies are typically intended to provide shelter from the rain or sun, but may also be used for decorative purposes, or to give emphasis to a route or part of a building" (Canopy, n.d.). Canopies differentiate themselves by material, colour, height, depth and shape. Unfortunately, neither Gehl or Koolhaas mentions the canopy in their literature. Nonetheless, in my opinion, the canopy can be a very important element of a mall as it does not just provide shelter, it also draws users towards the edges of a building, therefore towards the stores.

Central element: This element is actually more of a category, as it does not describe a single element, rather a group of elements, that each serve a similar purpose. These elements are mostly decorative, sometimes interactive, and are placed in a location with the goal of attracting attention and could be temporary or permanent. Examples could be decorative greenery and fountains or temporary decorations like Christmas trees.

### *Environmental behaviour*

In order to understand if and how behaviour can even be influenced by architecture, a quick deep dive into the field of environmental behaviour is required. A pioneer in this field of research is Amos Rapoport, who wrote multiple works on environmental behaviour, like *Human Aspects of Urban Form* (1977) and *The Mutual Interaction of People and their Built Environment* (1976). Rapoport's works have been the golden standard for environmental studies in architecture for years, but might be seen as outdated. Human behaviour has changed over the years, so their response to the environment must have as well. In *Human Aspects of Urban Form*, Rapoport describes the fundamentals of environmental behaviour and explains that the views on environmental behaviour have varied over time. First, there is *environmental determinism*, "the view that the physical environment determines human behaviour" (Rapoport, p. 2). On the other end of the spectrum, there is *environmental possibilism*, in which "the physical environment provides possibilities and constraints within which people make choices based on other, mainly cultural, criteria." The current view is that "the physical environment does, in fact, provide possibilities for choice and is not determining, but that some choices are more probable than others in given physical settings," also known as *environmental probabilism*. It is important to understand that the built environment cannot *cause* activities: "the built environment is a setting for human activities. Such settings may be inhibiting or facilitating and a particular setting may be facilitating to the extent of acting as a catalyst or releasing latent behaviour but cannot, however, determine or generate activities" (Rapoport, p. 2).

## Methodology and process

### *Observational study*

In this part of the research, an attempt has been made at finding new information about the effects of certain architectural elements on the user's behaviour. As this stage is the most critical and also requires intricate planning, information on how to conduct observations will be derived from Kawulich's *Participant Observation as a Data Collection Method*, (2005). Kawulich gives an extensive guide on how to conduct observation, how to handle the data and the advantages and disadvantages.

She proposes three types of processes, described by Werner and Schoepfle (1987, as cited in Angrosino and de Perez, 2000), of which I plan to use two:

1. Descriptive observation: observing anything and everything, assuming that you know nothing. This will be the first type of observation I will conduct, as I in fact know nothing. My aim will be to look for patterns of behaviour, but also the minutiae of everyday life that eventually might or might not be useful.
2. Focused observation: observation supported by interviews, therefore it is not a method that is useful to this research. The goal is to find environmental behaviour, which is mostly subliminal, meaning that if a subject was to be made aware of the environment that should be influencing him/her, his/her behaviour will no longer be unbiased.
3. Selective observation: focusing on specific types of observations. This method is only possible after the descriptive observation, in which some first patterns of behaviour are recognised. In this phase, these first suspicions can be reaffirmed (or debunked).

Kawulich also cites DeWalt and DeWalt (2002, p. 17), who note that "fitting in, active seeing, (...), recording detailed field notes and (...) patience" are important activities during observation. Visits will be made to locations where observations can be made without drawing attention. This also means that shooting video – as evidence or simply to look back and make sure I did not miss any behaviour – has to happen in a non-obtrusive way. Perhaps setting up a tripod with a camera that is constantly filming, is better than using a handheld camera and pointing it in people's faces if certain behaviour is observed. From an ethical standpoint, filming is always something you have to be careful with. Even though in public space, it is allowed, people might still object to it. Therefore, when someone does ask what my intentions are, it is important to be honest and when they object to it, offer to make them unrecognisable in the video or remove the footage.

A disadvantage of conducting observations of random people, is that the demographics will remain unknown. Gender, age and interpersonal relationships (whether a group of people are friends, family, colleagues, etc.) can be assumed, which could be useful to explain certain behaviour. For example, a group of male friends around the age of 15, will behave differently from when they are alone with family. However, other demographic information like occupation, race and religion will not be known. Luckily, this will not be important for my research.

During the observations, information was documented by shooting video, taking pictures and taking notes. All of this information was henceforth put in a large table, to create a structured overview, in which it was easier to see the relations between characteristics of the elements and observed behaviour.

## Results of the observations

For each element, several locations were visited. Subsequently, for each location, a description of the characteristics of the element is given, before describing the observed behaviour. This information is put in a table, with the goal of keeping the research structured. Afterwards, the relation between the element and behaviour is explained, with the goal of forming criteria for the element. To show how these criteria could be implemented in a design, the redesign case of Winkelcentrum Woensel is where exactly this has been done.

### *Floor*

For the research on floors, several locations were visited: Westfield Mall of the Netherlands in Leidschendam, the city centre of Eindhoven and Lijnbaan in Rotterdam. Whereas Westfield has some very expressive floors, therefore the relation between behaviour and the floors is clearly visible. The ones in Eindhoven and Rotterdam might fly under the radar, due to their more subtle aesthetics. Nonetheless, when observed closely, some typical behaviour can still be seen.

#### *Floor: Westfield Mall of the Netherlands*

Luxurious materials like oak, marble and terrazzo concrete make up the palette of the floors in this mall. The materials are often varied to mark routing, zoning or a change in function. People tend to stay on the material they are walking on. When walking on smooth concrete, rougher brickwork flooring is avoided by most people. Even when a significant change in texture is not present (for example with the change from marble to oak) people seem to be guided by the material they are occupying already. For example: if there are benches on an oak zone within the marble floor, people tend to avoid walking through that 'island' and only enter the zone when pausing.



1: Lines on the floor in Westfield Mall of the Netherlands can be used as 'road markings'



2 & 3: Creation of zones by a change of material



4: Change of texture and colour organises traffic as an 'intersection'



5: A change in material accentuates the change in function in this 'façadeless' store

Floor: Demer, Eindhoven

Smooth red bricks with occasional white concrete tiles. Yellow stripes on the floor remaining from covid times to manage traffic. During covid, there were 'guards' managing the traffic and making sure people stick to the right side. These guards are not there anymore, but people still seem to walk on the right side of the street. People wander over the line, but overall the division is clear.



6: Divisional line, used to separate pedestrian traffic

It can be concluded, that as a natural tendency, people tend to stick to the right. The smallest of elements like a line on the ground - whether it is permanent or temporary - or a change in material, can create a division between traffic streams. Naturally, it will not work like an actual road, where there is no one going against traffic. People will still walk on the left side or walk through a zone that is meant for resting when it is more convenient for them. The roughness and colour (thereby including material and things like temporary lines) of the floor can encourage - and perhaps limit - where people walk.

### *Stairs*

For the research on stairs, two staircases have been compared, as they are executed in two opposing ways: the stairs leading into the Koopgoot in Rotterdam on the one hand and the stairs in Piazza in Eindhoven on the other.

#### *Stairs: Koopgoot, Rotterdam*

Long threads and low risers in order for firetrucks to reach the lower level stores.

Alternatives are offered in the form of a ramp, escalator and elevator, but the ramp is steep and slippery and the escalator is placed far away from the stairs. The stairs are divided in three parts, with two horizontal areas breaking the rhythm.

The long stringer distance results in awkward walks. It could be said that the stairs are too flat to walk comfortably. In contrast, the ramp is too steep for a comfortable walk. People that use this ramp are basically 'climbing'. When it is wet, the ramp becomes slippery and is notoriously dangerous to use. For these reasons – and contrary to what Gehl says about ramps and stairs – the ramp is avoided by most people, despite the fact that the stairs are

also uncomfortable to walk on. The flatness of the stairs does have the advantage that the stairs do not obstruct the view, therefore limiting the barrier formed by the staircase.



7: People use the stairs, as the ramp is too steep and too slippery

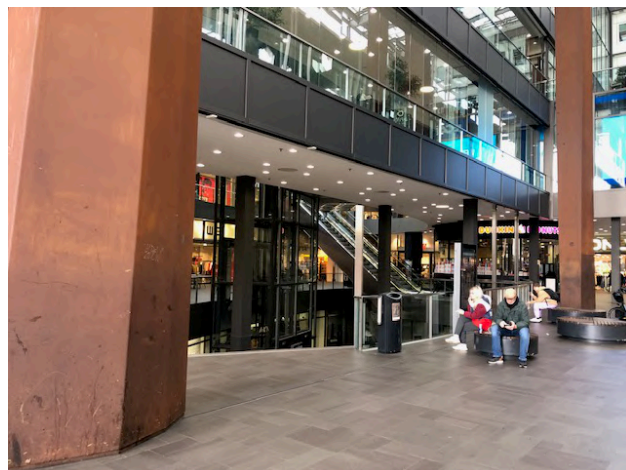
### *Stairs: Piazza, Eindhoven*

The stairs, going to the basement floor, are divided in two parts (one of which you can argue if they are still 'stairs') and it gets wider as you go down. The whole structure is finished in smooth concrete tiles. One part has a natural/normal thread and riser distance and is enclosed by hand rails on both sides. On one side, there are gaps in the hand rail, providing access to the other part of the stairs. In this part, two steps are combined to create seating. There are two wooden tables on these steps, where people can put their drinks or other stuff.

The stairs are not used very much. Despite the fact that the escalators (which are used the most in Piazza) do not reach the basement floor. A reason could be that Zara's entrance is barely used, as the store can also be entered on the ground floor. There is also another set of stairs, which are located next to the escalators and an elevator, which people might use when they are coming from a higher floor or the parking garage. At the time of observation, someone was sitting in the seating area and using the table. The steepness of the stairs also seem to play a large role in the use of these stairs. The staircase seems to follow the 'normal' inclination as described by Koolhaas. While this creates an inclination more suited to human dimensions, it does create a lack of visibility both up and down the stairs.



8: Stairs suited to human dimensions, making them 'walkable'. The addition of seats on the side creates visual interest.



9 & 10: Steepness of stairs creates lack of visibility both up and down

There is an interesting contradiction in the execution of the different types of stairs. Even though 'flat' stairs are considered uncomfortable to walk on, it seems the flatness does make them less of an obstacle. The fact that one can more easily look into the lower level when going down or does not have the feeling of walking 'into' a staircase when going up, arguably

helps in this. Implementing elements that encourage a 'pause', like seats or a plateau, also increase the attractiveness of stairs and might therefore lower the barrier.

### *Canopy*

Canopies are present in many Dutch malls, but once again it is most valuable to make a comparison between two opposing variations. The canopy in Lijnbaan has recently been restored to its former glory and is the first canopy that has been visited. The canopy in Winkelcentrum Woensel is there since the transformation in 2007 and will be on the other side of the comparison.

### *Canopy: Lijnbaan, Rotterdam*

Canopies covered in accoya-timber slats in a slightly orange finish. At the time of observation the canopies were decorated with Christmas lights and greenery. The canopy is almost uninterrupted throughout the entirety of the Lijnbaan, with a few exceptions. The depth of the canopy is 2,5m, it is about 3m above the street, it is completely horizontal and has an approximate thickness of 20cm. Below the canopies, the path is kept completely clear, there is probably an agreement between the store owners.

During the observations, the skies were grey, but there was no rain. Nonetheless, people tended to walk under the canopies on both sides. Due to the spatial arrangement of the street, people walk on the right side, these centrally placed elements might also explain why they are pushed towards the canopies. Nevertheless, looking at merely the canopies, people seem to be drawn to the sense of enclosure and cosiness given by the warmth of the timber and the Christmas lights.



11: Timber construction creates warmth and enclosure, unobstructed path underneath canopy

### *Canopy: Winkelcentrum Woensel, Eindhoven*

Glass canopies, carried by thick steel beams from the top. These beams also have lights on the end. The glass is frosted and has a light blue shade. Depth of canopy is roughly 2,5m, it is about 3m above the street and it has a slight angle. Signs for the stores are hung from the canopy, perpendicular to the facade. Below the canopies, many stores have put promotional signs and similar items.

Observation 1: grey skies, no rain. People rarely walk under the canopies. The path under the canopy is often blocked by promotional elements like signs, whereas the centre of the street is empty. The colour and brightness could also be a reason for the lack of use of the canopies. There is no sense of enclosure, cosiness or embracement from the chilly, semi-transparent canopies. Observation 2: bright blue skies; low, bright, December sun. The use

of the canopies was much more frequent this time. In an attempt to block the sun from blinding them, people walked under a canopy when walking towards the sun. However, in parts of the mall where the sun was not pointed at the face of pedestrians, the canopies were still not used much.



12: Obstructed paths and no sense of enclosure means the canopies are heavily underused



13: On a sunny day, people walk under the canopies to prevent the sun from blinding them

### *Central element*

As was mentioned before, this is more of a category of elements, therefore a variety of locations has been visited, ranging from temporary Christmas decorations to permanent items like a fountain.

### *Central element: Christmas tree, Koopgoot, Rotterdam*

Some people stop at the Christmas tree to take pictures of it or of themselves. Others just walk past it but do give it a glance, thus are distracted in their walk.



14: People like to take picture with this large Christmas tree

*Central element: Interactive photo location, Koopgoot, Rotterdam*

Photo location, in this case a structure that resembles Christmas gifts. A sign says 'This is where your nicest selfie starts', suggesting that there are more photo locations. People stop to take selfies, so the suggestion for interaction seems to work. The hope is probably that people post these pictures, using hashtags or tagged locations, increasing the digital visibility of the area.



15: People take up on the suggestion to take photos with this decorative element

*Central element: Christmas tree, Piazza, Eindhoven*

This Christmas tree has an opening in the bottom, allowing for people to interact with the tree. People take pictures with or of the tree and they are drawn towards it and want to go through the tunnel.



16: Children seem to like the 'tunnel' and so do their parents

*Central element: Fountain, Heuvelgalerie, Eindhoven*

Interior fountain, with an edge that could function as a bench and a central, small statue.

The fountain is in a central area of the mall, in front of stores like H&M. During summer, an ice cream stand is nearby.

The edge of the fountain presents itself as a bench for people to sit on. However, at the time of the first observation, in December, nobody was sitting there. In spring and summer, when the ice cream stand is nearby, people use it to rest from shopping and eat their ice cream.



17: The edge of the fountain presents itself as an attractive seating option

## Discussion

As Rapoport says, the physical environment is merely a setting for human activities and cannot generate or determine behaviour. There are other things influencing the users' behaviour, aside from their free will. Therefore, the results of the research and the conclusions that can be drawn from it should be nuanced, for reasons which will be explained in the following segment.

### *Time of year and weather*

Many of the observations for the research have been made over a short amount of time, mostly during winter. People's behaviour, both indoor and outdoor, differs with each season, regardless of the architectural elements. For example, seating options on stairs or near central elements will be used more often during spring and summer, as opposed to winter and autumn. People seemed to be drawn towards the warmth and enclosure of the timber canopies, but perhaps this is different during summer. Additionally, some of the locations were visited multiple times, in different weather conditions, but some locations were only visited once. For the locations that were only visited once, it is unsure how much of a role the weather plays. The use of canopies in Winkelcentrum Woensel depended heavily on the weather, so this could be the case in other locations as well.

### *Other circumstances influencing the behaviour around elements*

By relating the observed behaviour to the element's characteristics, a reasoning behind the behaviour can be found. However, there are many other influences that could alter the users' behaviour. The stairs in Piazza might just be underused because people do not like the stores that are in the basement. People in Lijnbaan might just walk under the canopies because they are automatically pushed to the side of the street by the centrally placed kiosks and planters. When claiming that a certain element is underused in for example the Heuvelgalerie, it should also be mentioned that this is a mall that is dealing with massive vacancy rates, therefore you could say that the whole mall is underused.

## Conclusion

For each of the elements, a set of criteria has been formed. These criteria will be used in the redesign of Winkelcentrum Woensel with the purpose of acting as an example to show how the criteria are integrated in the design process and testing if they are helpful to said design process. The criteria for floors – the use and variation of materials to guide people – can be used in the transformation of an existing shopping street and in a new street serving multiple purposes. The knowledge that a barrier formed by a staircase is mostly formed by the steepness can be used in two ways: a steep staircase could lead towards a private domain, so that it is less likely that people wander into the building; a flat staircase could lead to a public space, so people are more likely to use this public space. The glass canopies in Winkelcentrum Woensel will be replaced with timber canopies, as they seem to attract people towards the façades. Central elements like fountains, planters and trees will be placed in strategic locations like squares and at corners, to draw people towards these places. The information retrieved from the observation is valuable for the design of redesign of a mall, or any piece of architecture that contains these elements for that matter. However, as this research limits itself to these specific elements and the information on each element is based on observations that had limitations themselves, it must be said that this research is not complete. New elements could be added and new observations could help substantiate the recommendations.

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