

The Perspective of Pedestrians Regarding Walkability in Public Urban Spaces - Mapping the Pedestrian Perception of Triangeln, Malmö.

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"When I have to come here at night, I take a taxi. I do not feel safe in this area."



"The movements in this area are disorganised, with bicycles mixing with pedestrians."





Urban Studies Masters Programme

Making Urban Studies: VT23

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Mapping Pedestrian Perception of Triangeln, Malmö.

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1. Abstract

Recent developments have shown that walkability has gained great importance as cities can benefit from less air pollution, better public health and more attractive urban open spaces. Walking as a means of transportation has mainly been researched by using quantitative data such as planning aspects. For example, infrastructure and land use elements have been used to measure walkability through predefined indicators such as accessibility rather than focusing on pedestrians' experience on spaces. Therefore, this paper aims at capturing pedestrians' perception, opinions and emotions regarding safety, security and attractiveness in Triangeln, a major transport hub in Malmö, Sweden. The qualitative methods of emotional mapping and interviews have been used and are the main method of this attempt to showcase pedestrians' perception.

Keywords

Walking, Pedestrian Perception, Built Environment, Emotional Maps, Urban Public Spaces, Safety, Security, Attractiveness.

2. Introduction

The importance of walkability in urban environments has gained significant attention in recent years, as cities strive to create sustainable and livable communities. In the context of Malmö, Sweden, the city introduced the Malmö Comprehensive Plan and the Malmö Mobility Plan to shape the city's vision for walkability and promoting a pedestrian-friendly environment. These strategic plans recognize the value of walkability in enhancing the quality of life for residents, promoting sustainable transportation options, and creating vibrant, inclusive neighbourhoods.

Pedestrianism is an essential option for transportation with significant health, environmental, and economic advantages. However, several obstacles, such as traffic congestion, a lack of pedestrian infrastructure, and safety concerns, frequently impede pedestrianism. These factors can influence pedestrian perception of the built environment and surroundings and impact walking frequency and/or route selection. Therefore, understanding the link between pedestrian perception and the built environment is critical for encouraging pedestrianism in urban settings.

Human Perceptions are not innate or static; rather, they are profoundly influenced by the social and historical contexts in which individuals exist (Berger & Luckmann, 1966). Ultimately, embracing the notion of perceptions as socially and historically shaped enhances our comprehension of human behaviour, cognition, and the intricate dynamics between individuals and their environments.

Previous studies have predominantly employed quantitative methods to understand the relationship between the built environment and walkability, focusing on the impact of planning solutions on pedestrian behaviour. While quantitative methods are powerful in analysing large sets of numerical data and detecting statistical trends, they have limitations compared to qualitative methods. Quantitative methods bear the risk of oversimplification and misinterpretation of results by neglecting the context and meaning behind the data, assuming uniform interpretations among participants, and overlooking the richness of human experiences. In contrast, qualitative research methods provide valuable insights into the complex and nuanced experiences, emotions, and perspectives of pedestrians.

The research aims at exploring the connection between pedestrian perception, the built environment and perspectives on Malmö planning policies to understand how pedestrians experience the existing planning solutions and built environment. Specifically, the study will

explore pedestrian perception related to safety, security, and attractiveness of urban public spaces. The research questions are as follows: How do pedestrians experience public space in a centrally located complex area? How do they perceive aspects of safety, security, and attractiveness? Do planning requirements and guidelines of Malmö consider pedestrian perspectives?

Triangeln has been chosen as the research location due to its central position in Malmö, Sweden (see Fig. 1), and its significance as a transport hub. Triangeln has undergone notable development over time, transforming from a rural area to a city centre with high-rise buildings (Malmö Stadsbyggnadskontor, 2022). It serves as an important transport node for various bus and train routes, with a daily passenger volume of 40,000 people (NCC, 2022; Skånetrafiken, 2022). The surrounding districts have a high population, indicating that walking and cycling for short trips are common among locals. Therefore, studying pedestrian perception in Triangeln can provide insights into navigating dense and complex urban areas and inform the development of pedestrian-friendly infrastructure.

Through literature analysis, observations, emotional maps, interviews, and examination of secondary data such as Malmö's planning policies, the study aims to gain a comprehensive understanding of the current state of walkability in Malmö, identify areas for improvement, and propose recommendations from pedestrian perspectives to enhance the walking experience and encourage pedestrianism in the city.

3. Literature Review

Introduction

The literature review will focus on defining the key words and associated concepts. Safety, security and attractiveness as primary concepts have their own sub-sections. Walking as a means of transport, walkability, urban public spaces and pedestrian perception will be referenced within all sub-sections and as a result briefly defined below. The main method of emotional maps will be explained. Alfonzo (2005) explains how concepts such as safety, security and attractiveness are key in measuring walkability.

Alfonzo (2005) proposes the hierarchy of walking needs, which categorised the constituents of walkability into four primary factors: Sidewalk Condition, Traffic Safety, Security, Comfort, and Attractiveness. Alfonzo's (2005) hierarchy of walking needs suggests that an individual's needs related to walking range from the fundamental (feasibility) to the high-level (urban form-related), including accessibility, safety, comfort, and pleasurability.

Using these definitions these concepts have been narrowed down to three main concepts that can encompass the other concepts Alfonzo (2005) has highlighted. This chapter will include reasoning and definitions as to why these concepts include further elements. In defining safety, security and attractiveness, the associated concepts mentioned above are defined as follows.

Associated Concepts

Walking as a means of transportation. When distinguishing between walking as a means of transport, and recreational travel where the primary purpose is to visit an urban public space, different factors in the built environment impact the choice to walk for either purpose (Mirzaei et al., 2018; Bumjoong Kang et al., 2017).

Walkability. Walkability is a concept in urban planning to measure the accessibility of walking for users in an urban public space. Among factors and measurements that impact walkability

security, traffic safety, sidewalk condition, and comfort are perceived as crucial (Arellana et al., 2020).

Urban public space. An urban public space can be anything: a public garden, park, sports and recreational ground or sidewalk. But also links, nodes, squares and streets; in a word, the urban fabric. Facilities such as public toilets, parking areas, street lights, or traffic lights and signage are also part of public spaces. They serve as a buffer zone in high density areas that allow citizens to spend time or as a transportation network to get around the city. According to Lynch (1964), public spaces refer to all spaces that are open to people to use for all kinds of activities (Jurkovič, 2014; Lynch, 1964). They are aimed at every single individual, both residents and visitors and therefore, should be accessible to them (Jurkovič, 2014; Ramlee et al., 2015). However, Dewey (1927) gives another definition of the word ‘public’: the public encompasses everyone who is affected by decisions regarding spaces. Thus, the term ‘public’ is rather political as political institutions usually decide over urban problems. Therefore, the distinction between public spaces and private spaces can be seen as a social and spatial organisation of a city (Madanipour, 1999).

Urban public shared spaces. Furthermore, public space can be measured according to their accessibility which is dependent on material conditions or physical layouts (Tonnelat, 2010). One of those physical layouts is a shared space: a street or place that is designed for all means of transportation, especially designed to improve walkability by reducing the speed of cars and increasing safety (Kaparias, 2012). As drivers stay more alert and engage with their surroundings, they need to pay attention to other traffic users – which leads to a lower speed of cars. The overall goal of that scheme is to improve quality of life and to create spaces that people can enjoy. Shared spaces usually use features such as uncontrolled pedestrian crossing, no signal control or a single surface with no separation of pedestrians and vehicle areas. A successful shared space can be defined as a space that improves the comfort and confidence of pedestrians.

Pedestrian perceptions. Pedestrian perception of urban public spaces is influenced by various factors, such as accessibility, aesthetics, comfort, convenience, attractiveness, familiarity, connectivity, safety (related to traffic), and security (including personal safety and fear of crime) (Balasubramanian & Bhardwaj 2018; Basu et al., 2022; Ferrer et al., 2015).

Safety

Safety is physical safety in relation to traffic and infrastructure. Campos Ferreira et al. (2022) identify numerous determinants within the categories of traffic and infrastructure affecting the perception of safety in urban public spaces. According to Campos Ferreira et al. (2022), perception of safety in urban public spaces affects users’ decision to walk or cycle.

Perception of safety varies with the characteristics of the user. Holman et al. (2022) highlight how perceptions of safety in urban public spaces in Milan vary with the race of a user. Trop et al. (2023) explain how culture, biases, the situation and personal characteristics acts as a mediator in perception safety in urban public space. Dhasmana et al. (2022) explain how women prioritise different determinants in their perception of safety in urban public spaces in Chandigarh.

Therefore, in researching safety, two dimensions should be considered. Firstly the demographic of the pedestrian, this can gauge how unique their perception is to their demographic. Secondly, their perceptions of safety around traffic and infrastructure in the urban public space.

Security

According to Campos Ferreira et al. (2022) security encompasses two categories: crime and infrastructure. Differing from infrastructure safety, infrastructure security is where the construction of the built environment in an urban public space leads to the perception of a lack of security, whereby the pedestrian feels threatened that crime might occur. Infrastructure

highlighted in literature that contributes to a threat to the security of pedestrians includes parking lots, lack of street lighting, tree shadows or hidden spots (Campos Ferreira et al., 2022; Trop et al., 2023).

According to Ferrer et al. (2015), the factor that discourages walking the most is safety concerns related to crime. Pedestrian barriers can include crossing avenues, roundabouts, and narrow sidewalks. Additionally, some participants perceive sidewalk cafés and bollards as obstacles.

The perception of potential for crime in urban public spaces affects a pedestrian's perception of security in the space. Determinants of this can be potential for theft or vandalism of property, absence of people or fear of aggression (Campos Ferreira et al., 2022).

As with safety, perception of security varies with the characteristics of the pedestrian. Roy & Bailey (2021) explain how women feel less secure in urban public spaces in Kolkata because of perceptions of the male gaze. Furthermore, a perceived lack of awareness of the culture of other users decreased feelings of security. This results from both infrastructure (for instance crowded buses) but also from crime in the perception and previous experience of harassment in the space.

Similarly, Holman et al. (2022) highlight how the maintenance of an area and the emptiness of a space (so the infrastructure) can be regarded as determinants that affect pedestrians of different races differently.

Attractiveness

Attractiveness is a user's perception of attractiveness and consists of different elements to which the most obvious (but equally important) element is aesthetic attractiveness. Other elements include accessibility, social attractiveness, built environment, businesses and land use.

Basu et al. (2022) found that the land use environment along a walking path significantly impacts pedestrians' perceived attractiveness, safety, and security. According to the research, walking paths that pass through commercial or mixed-use areas tend to be perceived as less attractive for walkers. According to Ferrer et al. (2015), pedestrians may perceive micro-level factors, such as navigating through streets intersected by avenues, roundabouts, and narrow sidewalks as barriers in the built environment. Certain participants perceive sidewalk cafés and bollards as obstacles.

Therefore in defining perceived attractiveness, investigating not only perceived physical attractiveness but conceptualisation of the urban public space is important. Kamińska and Mularczyk (2021), highlight that aesthetic order is one element of attractiveness, and it is subjective. The authors also note that physical and visual accessibility enable people to enter space which is important not only from an inclusivity perspective but also for: tourism, settlement, investment and socially; as a meeting place for local inhabitants. Therefore inclusivity is an important element in making a space attractive to all.

With aesthetic attractiveness being a key element in perceived attractiveness and being so subjective; everyone will perceive it differently. It will therefore, as with safety and security, differ based on the characteristics of the user.

Summary

This literature review has reviewed concepts related to pedestrian perception in urban public spaces. The primary lens through which this paper will conceptualise this is through the concepts of safety, security and attractiveness.

In understanding actors and the space in this field the secondary concepts of walking as a means of transport, urban public space, pedestrian perception and walkability have been defined and reviewed. The main takeaways being that literature shows that many different elements affect the

perception of urban public space by users, and that safety, security and attractiveness are the primary criteria for understanding pedestrian perception of public space.

In addition to the elements of the urban public space the characteristics of the pedestrian affect how they perceive the space and thus everyone can perceive an urban public space differently and have different needs when improving the space.

Therefore, in creating well-used and positively perceived urban public spaces both elements of the space but also the characteristics leading to one's perception of the urban public space must be considered.

4. Methodology

The case study

The case study focuses on the application of emotional mapping techniques to study pedestrian perception in a specific and complex urban environment, such as Triangeln. The purpose of the research design is to explore and analyse pedestrian perception in a specific urban environment using qualitative approaches, such as emotional maps and interviews.

The research design is aligned with the purpose of understanding the subjective experiences, emotions, and perceptions of pedestrians in relation to the urban environment. It allows for an in-depth exploration of how individuals interpret and respond to the physical and sensory aspects of the environment. By focusing on this specific case, the nuances and complexities of pedestrian perception in a targeted area are captured, providing valuable insights into the factors that influence people's emotional experiences and their relationship with the built environment.

Triangeln is an interesting research location for studying pedestrian perception due to its unique characteristics and complexities. It offers a mix of commercial, residential, and public spaces, providing diverse experiences and interactions for pedestrians. This urban complexity creates a dynamic environment that can influence pedestrians' emotional responses and perceptions of the surroundings. Additionally, Triangeln showcases a blend of modern architecture and historical structures, resulting in an intriguing visual landscape. The architectural diversity adds another dimension to pedestrians' experiences and how they perceive the environment.

Furthermore, Triangeln serves as a major transportation hub with various intermodal means of transportation such as trains, buses, and bicycles. The integration of different transport systems into the urban fabric can significantly impact pedestrians' experiences and perceptions. By exploring Triangeln as a research location, we can examine how transport infrastructure affects pedestrian perception and behaviour.

By exploring Triangeln as a research location, it can be investigated how the interplay between the built environment, transport infrastructure, and emotional experiences influences pedestrians' perception of safety, security, and attractiveness. The integration of emotional maps and qualitative approaches enables researchers to capture pedestrians' subjective experiences and gain insights into their perceptions of these crucial factors.

Location

Triangeln, located in the inner Malmö stad in Sweden, underwent significant transformation from a rural area to a city centre during the 19th century (Malmö Stadsbyggnadskontor, 2022). The development included the construction of high-rise buildings, increasing the density and establishing Triangeln as a prominent centre (Malmö Stadsbyggnadskontor, 2022). In 1989, a hotel and shopping centre were added, which generated debates among residents (Malmö Stadsbyggnadskontor, 2022).

Triangeln Station serves as a crucial transport hub in Malmö, offering a range of bus routes (Skånetrafiken, 2022). Additionally, the train station, constructed 25 metres below ground level and opened in 2011, provides connections to Denmark and other regions of Sweden (Malmö Stadsbyggnadskontor, 2022). The adjacent Triangeln Shopping Centre, completed in 2013, is accessible from the train station (NCC, 2022). With a daily passenger volume of around 40,000 people, Triangeln Station is a key transportation facility in the city (Hässleholms kommun, 2017; NCC, 2022).

The areas surrounding Triangeln are characterised by dense developments, primarily comprising residential and mixed-use buildings in administrative districts such as Rådmanvängen, Mölllevängen, Västra Sorgenfri, Södervärn, and Davidshall (McShane, 2023). As a result, short trips suitable for walking and cycling are encouraged among local residents.

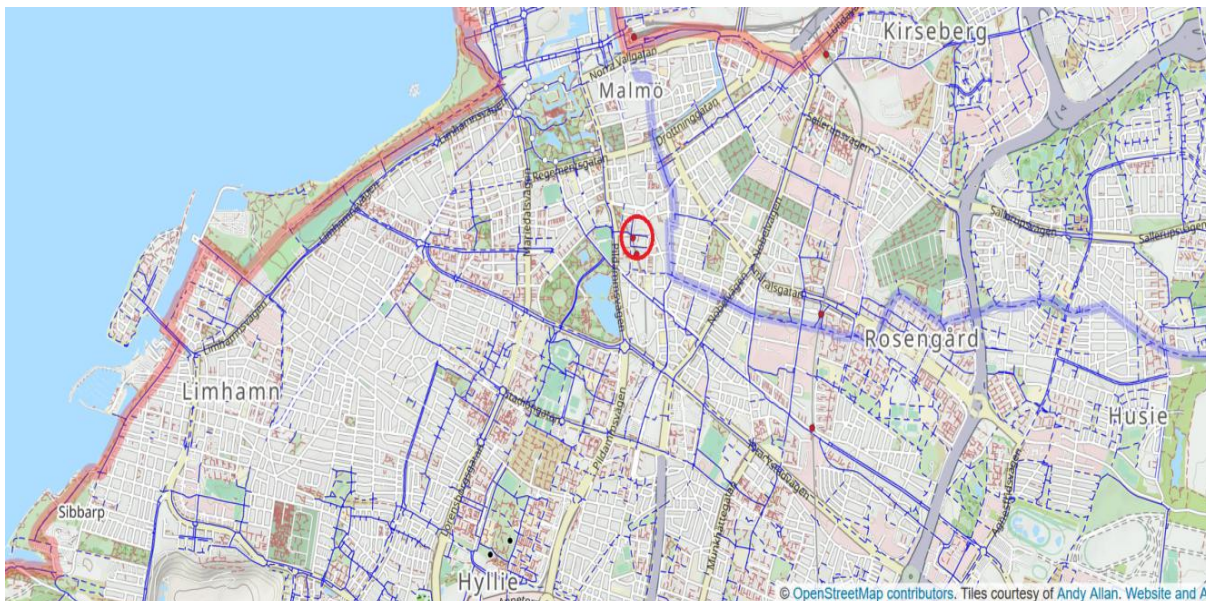


Fig. 1: Location of Triangeln in Malmö, Sweden (Maps sourced from OpenStreet map; Allan, 2022).

From Mental Maps to Emotional Maps

The human mind is capable of making inferences that extend beyond the information explicitly presented (Bruner, 1957). According to Johnson (2009), the process of perceiving even the most basic entity is not a simple task but rather a complex and multifaceted process. The process of perceiving is influenced by various factors, including cognitive limitations, attention, past experiences, and cultural background. Visual perception demonstrates that individuals construct their own perception of the world based on cognitive constraints rather than perceiving an exact image. They actively interpret their environment by selectively focusing on certain aspects. Thus, visual representations cannot be considered neutral or static but are shaped by the form(s) of representation used (Johnson, 2009).

The public's perception of urban planning is an essential component for planning authorities, as it contributes to a better understanding of the implications of policies and actions implemented with regard to the built environment. Therefore, it is crucial for planners to take into account the public's perceptions when formulating urban planning policies and actions.

Mental maps are highly relevant for studying pedestrian perception and the overall walkability of urban environments. A mental map refers to an individual's cognitive representation of their surroundings, including landmarks, routes, and spatial relationships. Examining mental maps allows researchers to understand how individuals perceive and navigate the built environment,

providing valuable insights into their experiences, preferences, and challenges related to walking (Golledge, 1999).

Similarly, emotional maps also play a significant role in understanding pedestrian perception and the overall walkability of urban environments. Emotional maps capture individuals' subjective emotional experiences and associations with different locations within the urban landscape (Pánek & Benediktsson, 2017). These emotional associations can greatly influence pedestrian behaviour, preferences, and perceptions of safety, comfort, and attractiveness. By examining emotional maps, researchers can gain insights into the affective dimensions of pedestrian experiences, shedding light on how emotions shape movement patterns, route choices, and overall perceptions of walkability.

Emotional Maps as the Main Method to Capture Pedestrians Perception

Mapping is a widely used method in quantitative research, but recent scholars have introduced qualitative approaches, such as mapping feelings and emotional maps (Pánek & Benediktsson, 2017; Weinreb & Rofè, 2013). These approaches are connected to the method of cognitive (mental) mapping, which was initially defined by Kevin Lynch in his book 'The Image of the City' and expanded to include mapping environments and the development of psycho-geography (Roberts, 2012). Social-psychological factors, such as gender and generalisation, can influence the mental map-making process and the understanding of recorded information (Manivannan et al., 2022; Roberts, 2012). Emotional maps and feeling maps are two similar approaches to mental mapping that can be used to analyse the relationship between the built environment and pedestrian perception (Bashandy et al., 2022).

Feeling maps involve participants walking through an area and marking on a map the locations where they experience specific emotions, providing a more accurate representation of their emotional responses to the environment (Weinreb & Rofè, 2013). The evaluation of the environment and the mapping of emotional experiences have been studied in environmental psychology using cognitive mapping (Golledge, 1999; Nasar, 1992, 1998). Weinreb and Rofè (2013) developed an approach called the feeling map technique, which allows participants to evaluate and describe their surroundings in real-time. This technique enables the identification of emotional response patterns and the assessment of the influence of environmental factors on emotional experiences.

Emotional mapping focuses on representing personal, qualitative, and grassroots spatial data about the environment in a structured, quantitative, and top-down GIS context (Pánek & Benediktsson, 2017). While emotions are integral to human nature, their representation in maps and spatial information is often overlooked (Griffin & McQuoid, 2012). Emotions are considered at the intersection of bodies, minds, and places, emphasising the importance of spatiality (Griffin & McQuoid, 2012). Pánek and Benediktsson (2017) argue that emotional mapping involves mapping individuals' perceptions and experiences of a particular place rather than mapping emotions themselves. Emotional maps can provide significant information for urban planners and city officials, highlighting the relationship between emotions, locations, and physical spaces (Pánek & Benediktsson, 2017).

The use of emotional mapping and feeling maps has been more commonly applied in studying the experiences of cyclists (Weinreb & Rofè, 2013; Pánek & Benediktsson, 2017). However, their application to studying pedestrian perception is limited in academic literature. This study further relates the concept of emotional maps to counter mapping. Counter mapping can be described as an alternative mapping approach, challenging power dynamics in maps and map-making processes (Harris & Hazen, 2006). It aims at mapping and thus exposing things that were not mapped before while providing different perspectives (Harris & Hazen, 2006). In this context of urban planning, counter mapping allows for showcasing perspectives of those who were not part of the planning processes. Consequently, counter mapping can inform policy makers and

introduce them to public perceptions of these planned spaces and how planning relates to lived experiences of users.

By applying these qualitative research methods to study pedestrian perception of Triangeln, this research can contribute to the literature on walkability perception through cognitive counter mapping. The use of emotional maps in this context can provide insights into the subjective experiences and feelings of pedestrians in the studied area. The study can be seen as experimental in using the emotional map technique and can shed light on the relationship between the built environment and pedestrian perceptions, adding to the understanding of urban spaces from a holistic perspective.

Choice of Methods

Qualitative research methods for pedestrian perception include conducting surveys and focus group interviews (Ferrer et al., 2015), photo voice methodology (Lockett et al., 2005), social media data mining (Vukmirovi et al., 2022), and cognitive mapping (Weinreb & Rofè, 2013). Ferrer et al. (2015) believe qualitative research methods to be the most suitable approach for examining the diverse array of factors in studying pedestrian perception.

This study makes use of a qualitative approach with observations and emotional maps accompanied by structured interviews. Initially, the research site was visited in an unstructured observation to get an overview of the space and to further determine the subsequent methods which are further explained in the following sections.

Unstructured Observation

By employing unstructured observation at the beginning of the research, a holistic understanding of the area has been gained before implementing more specific research methods. This approach allowed us to familiarise ourselves with the context, identify patterns and themes, and generate hypotheses for further investigation.

Based on the initial unstructured observation of Triangeln, specific routes were identified where it was aimed to explore pedestrian perception. These routes were chosen based on unstructured observations that indicated potential areas of interest in terms of pedestrian experiences, as well as possible conflicts related to safety. The goal was to examine how different modes of transportation coexisted, and whether there were conflicts or challenges in terms of pedestrian safety and convenience.

Furthermore, the objective of the unstructured observation was also to understand the intensity of movement of pedestrians and identify the busiest spots and routes where possible conflicts could arise with different transport modes.

Structured Observation

After conducting the unstructured observation, it was determined that a structured observation approach would be employed to gather more specific data about the site. The structured observation aimed to measure the intensity and direction of traffic by using sketch maps of pathways commonly used by users. Additionally, demographic data and specific criteria were collected during the observation. The criteria included observing safety of design and user behaviour, noise levels in the space, notable irregularities or outliers, adherence to social norms, the impact of structures on the space, good transport connections, and weather conditions. These criteria were predetermined and outlined in an observation guide.

The structured observations took place on Tuesday, April 25th, 2023, as well as Saturday April 29th, 2023, at various times throughout the day and night. Four time slots were selected: from 8:00-9:00 in the morning, around noon from 12:00-13:00, in the afternoon from 16:00-17:00, and at night from 21:00-22:00. These time slots were chosen to provide an overview of site usage and intensity throughout the day, considering commuting and shopping patterns. The

morning and afternoon time slots accounted for people travelling to and from work, with increased frequency of the Öresundstrain departing every 10 minutes. The noon time slot accounted for individuals taking their lunch break, which typically starts at 12:00 in Sweden.

At Triangeln, two specific sites were chosen for the structured observation considering the results of unstructured observation: the shared space between Triangeln Station and Triangeln Shopping Mall, and the nearby bus stop, Triangeln. The locations of these sites are depicted in Figure 2. Each site was observed for a duration of 30 minutes, resulting in a total observation time of one hour. The initial 15 minutes of each observation were dedicated to creating a flow and intensity map, documenting the movement patterns of pedestrians and identifying the number of people walking in different directions. The remaining 15 minutes were utilised to address the predefined questions from the observation guide and to take detailed notes on the individuals and activities observed.

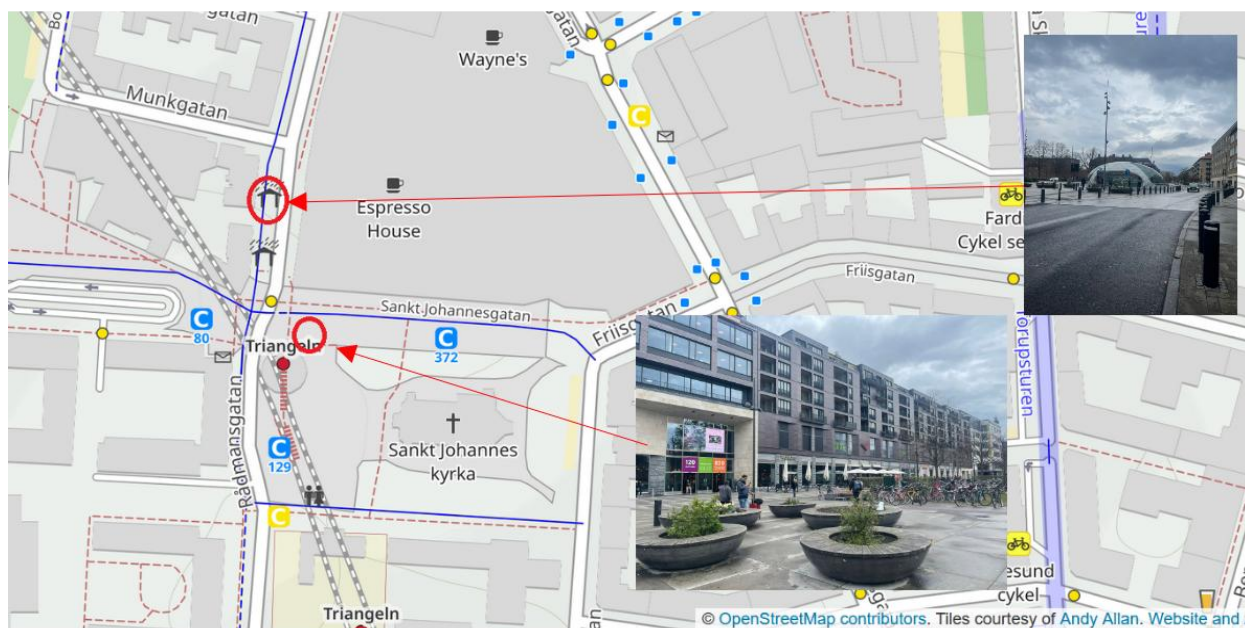


Fig. 2: Locations of study sites (Maps sources from OpenStreet map; Allan, 2022; Pictures taken by the authors).

Emotional Maps and Structured Interviews

Emotional mapping was chosen as the approach to visualise pedestrian perceptions of Triangeln. This method focuses on capturing people's feelings and experiences of a particular space, offering a unique perspective that goes beyond traditional mapping practices (Pánek & Benediktsson, 2017; Weinreb & Rofè, 2013).

Different individuals were approached and invited to share their opinions and feelings about the space, making this approach a participatory mapping method (Cochrane & Corbett, 2018). Participatory mapping can be described as a process of map making where communities are asked to present issues such as their experiences or feelings towards a certain space and thus making their perspectives visible (Cochrane & Corbett, 2018). This process is also called community mapping and aims at inclusiveness and can be considered as a bottom-up process (Cochrane & Corbett, 2018). Participants were specifically asked to identify and draw routes that were associated with positive and negative emotions or experiences. Each mapping session was accompanied by structured interviews, where pedestrians walking around the Triangeln area were asked a set of questions to gather further insights.

The interviews followed a predetermined set of questions that covered various aspects, such as general feelings about the space, changes in perception during different times of the day, and

factors like age, gender, mode of transport, and purpose of visit. Using a printed map, participants were instructed to mark areas they liked and disliked using different colours and provide explanations for their choices. The mapping and interview process lasted approximately 10 minutes per participant and took place on May 10th and May 11th, 2023, in the afternoon. A total of 11 maps were generated, offering valuable insights into the participants' personal opinions and emotional responses towards the Triangeln area.

Secondary Data

Secondary data analysis was conducted to examine the current planning policies in Malmö, specifically focusing on walkability and design considerations for public spaces. The study reviewed the Technical Handbook, which outlines requirements and guidelines for new developments in the city. Additionally, the comprehensive plan of Malmö and the Sustainable Urban Mobility Plan of Malmö were analysed to understand the broader policy framework.

Limitations

Creating the flow and intensity maps on site while also conducting structured observation proved to be a challenging task, as the space was very crowded, especially during morning and afternoon rush hours. Thus, it was hard to capture each and every person walking by and the flow/ intensity maps consequently provide more of a general overview of where people are going and coming from and indicate roughly how many people were present. Nevertheless, the flow and intensity maps still gave valuable insights and aided in identifying possible conflicts and how the space is used.

Similarly, the structured observations were only carried out by one person at a time and as a consequence can be regarded as subjective to some extent, despite an observation guide being determined beforehand. The observations were only carried out on two days due to time constraints. However, the observation guide allows for a repetition of these observations in the future and it could be beneficial to repeat these throughout the year, in different weather conditions and throughout weekdays and weekends.

The issue of time constraints can also be related to the amount of emotional maps and interviews that have been collected. Eleven emotional maps, accompanied with questions reveal important and valuable insights from users as to how they perceive the space as well as acting as bottom-up research. The emotional map that has been done using QGIS, summarising all emotional maps that have been drawn, it is rather unclear which side of a street was meant to mark. Therefore, an entire street is marked as negative or positive instead of showing the difference of different parts. Furthermore, the same map shows all the information that has been collected beforehand, regardless of whether the participant was male, female, between 20-30 or older than 60. Therefore, the emotional map is rather generalised.

For future research, pedestrian mapping could be extended to a larger scale and for a prolonged period of time. Another limitation regarding the mapping of pedestrian perception is the language barrier, which should be addressed in future research. The questions and tasks were written in English as none of the group members spoke Swedish on a sufficient level. Not all participants felt comfortable answering in English and therefore could not contribute to the research.

Besides this, data from the Malmö stad was sparse. Malmö stad was contacted in the beginning of the research process for policy documents, plans regarding Triangeln and a possible interview with a planner. Unfortunately, the requests remained unanswered which resulted in a limited amount of data about the city. Therefore, our analysis of current policy rests solely on technical and legal documentation that is publicly available and does not involve an interview with a planner.

During analysis literature available publicly has been used through google scholar and Malmö University library as well as reference to current policy publicly available through the website of Malmö Stad and various Swedish public agencies. Some documents of Swedish public agencies were in Swedish and were machine translated. When translation was unclear on the machine translation the original was consulted with Swedish colleagues to clarify meaning.

All academic articles that have been used are in English and as a result possible relevant research may have been excluded that was either in another language than English or not available through Malmö University library or found by google scholar.

Summary

The methodology employed in this study focuses on mapping the emotional and perceptual experiences of pedestrians in the Triangeln area. The research draws upon qualitative approaches, including emotional maps, which have been used to study the cognitive mapping of urban environments.

The choice of qualitative mixed methods both intended to fill a gap in walkability research but also highlighted disparities between planning and pedestrian perception in Malmö. The sequence of methods: unstructured observation → structured observation → structured interview + mental mapping, means that following methods can be prepared with information from the previous method with the result of the main method of mental mapping being informed by the most possible information.

By applying these qualitative research methods to study pedestrian perception in Triangeln, the research aims at providing insights into the subjective experiences and feelings of pedestrians in the area, contributing to the limited academic literature on pedestrian perception and walkability. Overall, this study utilises innovative approaches to map the emotional and perceptual aspects of the built environment, offering a holistic understanding of urban spaces from the perspective of pedestrians.

5. Results

Unstructured Observation

During the unstructured observation conducted on 24 April 2023 from 10:00 to 11:00 in the area around Triangeln, several specific areas were identified as interesting for further study. The main focus was to explore areas interesting to study how pedestrians perceive the safety, security, and attractiveness of these spaces. Two particular locations were selected:

- The shared space between Triangeln Station and Triangeln Shopping Mall: This area stood out due to its significant pedestrian flow and its role as a connection point between the station and the shopping mall. It is also characterised by its intermodal nature, with the presence of pedestrians, cyclists, and potentially motorised vehicles sharing the same space. The diverse urban fabric surrounding this shared space and the three main routes leading to different parts of the city added to its complexity.
- The bus stop at Triangeln: This bus stop, located around the corner from the shared space, was chosen because of its high activity levels and the potential conflicts that may arise between cyclists and pedestrians. With the continuous arrival and departure of buses, the area experiences a mix of pedestrian movements and interactions with different modes of transport. Studying this location could provide insights into the perception of safety, security, and attractiveness in a context where various transportation modes converge.

These specific areas were selected based on their complexity in terms of intermodal transport, mixed land use, and the potential for conflicts, making them ideal for investigating pedestrian experiences and perceptions.

Structured Observation

The structured observations of Triangeln revealed a mixture of uses of the space, potential and actual conflicts, walking routes, and gave an overview about the demographic that was present in the space. It became obvious that the space is used differently during the week compared to weekends and also the amount and composition of people varies.

On Tuesday, people were observed either rushing to the bus or to the train station in the morning. The main demographic appeared to be middle-aged people commuting to work, as the shopping mall was not opened yet. Many people leaving the station went to the bus stops to take a connecting bus. Conflicts that were observed concerned the crossing of the cycle paths by pedestrians without looking for cyclists and jaywalking at the bus stop.

At noon the square got moderately busy. The demographic changed compared to the morning. A mix of elderly people, middle aged adults with strollers with children and a few teenagers were observed. The main intensity of traffic was people walking from the entrance of the shopping mall to the entrance of the train station. Conflicts were observed involving pedestrians, bikes and buses seemingly weaving around each other without the need to stop and let others pass. Elderly users with various walking aids and one wheelchair were seen.

In the afternoon the space became very crowded. People primarily walked fast, some even ran to the station but a few shoppers were moving at a slower pace. Most people were identified as middle-aged commuters coming from work and shoppers. Overall, the age groups were imbalanced as children and elderly were in a minority. The situation was very chaotic and there were several conflicts with the high frequency of bike traffic. Pedestrians seemed unsure when to cross it as many bikes cycled fast. Several pedestrians wanted to cross the bike lane and immediately jumped back when they saw a bike approaching whereas others crossed anyways and were almost run over. The bus stops were also very crowded and jaywalking behind or in front of the buses was observed.

At night, the space was still busy, especially around the entrance of the station and the surrounding waiting area where people were seated on benches and standing around. The flow of cyclists was also intense and again conflicts between bike and pedestrians were observed. The bus stops were also crowded, and many people had to wait outside the bus shelter, creating a feeling of unsafety and discomfort. Street lighting was available, also around the bus stops. Overall, the demographic at night was rather imbalanced as no people with limited mobility were observed.

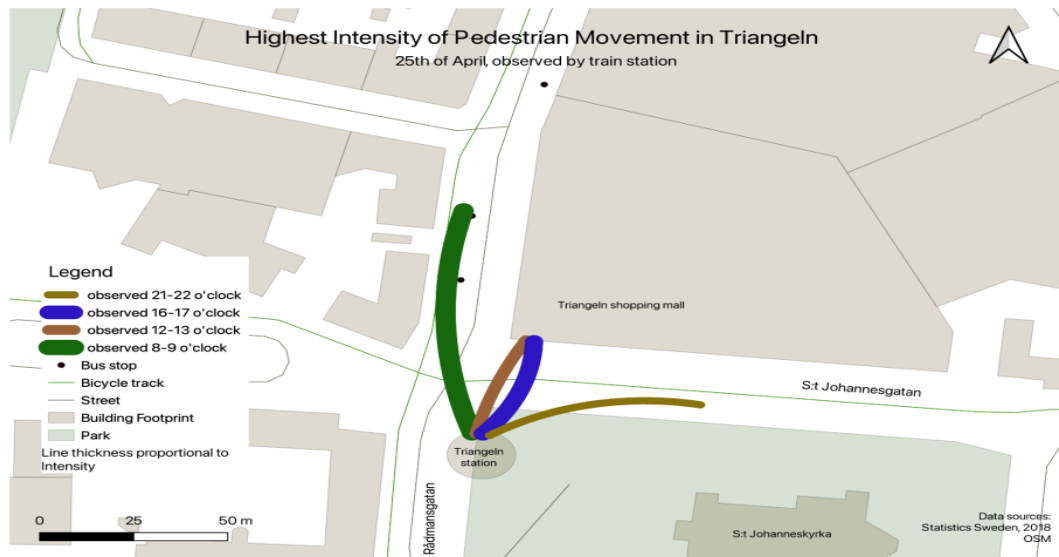


Fig. 3: Highest Intensity of Pedestrian Movement in Triangeln (25th of April, observed by the train station) (own figure).

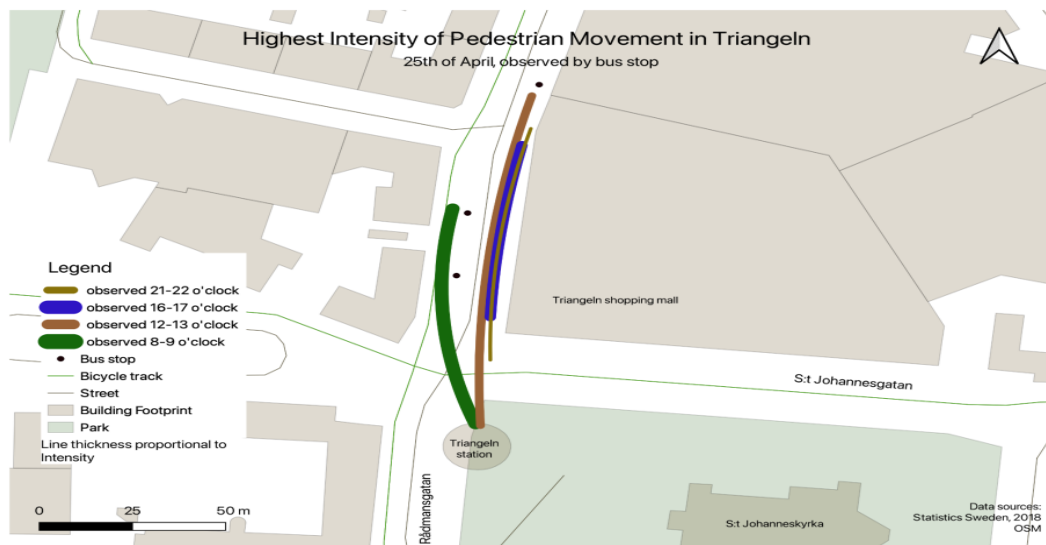


Fig. 4: Highest Intensity of Pedestrian Movement in Triangeln (25th of April, observed at the bus stop) (own figure).

On Saturday, the overall atmosphere of Triangeln early in the morning was calmer with very few cyclists crossing the square and the bike racks further away from the station were almost empty. People leave and go to the station every now and then but they are coming from all directions. Most of the pedestrians that are walking around in Triangeln are not taking the bus but crossing the square. One observed conflict was a cyclist cycling on the sidewalk but due to the limited amount of people present this did not pose any danger.

Around noon, the area was busy, especially around the entrance of the train station and the surrounding waiting area. People were mostly heading towards the shopping centre or the bus stop or continued walking alongside Triangeln shopping centre. During that time, more potential conflicts were observed regarding pedestrians, cyclists, strollers, and scooters around the entrance of the train station and waiting area. The physical setting of the area was overcrowded, particularly the waiting area around the entrance and the bus stops. The demographic makeup

was mainly adults, including some people with special needs or disabilities, several families with kids and strollers, and individuals going to the shopping centre.

In the afternoon, this demographic remained similar. The atmosphere appeared to be more relaxed with people walking at a slower pace. Even though fewer bikes were present in comparison to Tuesday, the cyclists still drove wherever e.g., on the sidewalk, and crossing the square without really paying attention to pedestrians. There were so many bikes parked near the station and a few bikes were blocking parts of the pedestrian space. Generally, pedestrians were able to cross the square without problems due to the reduced speed and quantities of bikes. The biggest flow of people was towards the shopping centre or alongside the shopping centre. Pedestrians jaywalked but due to the reduced number of buses, this was less dangerous at that time. Even though it was less busy at the bus stops, the sidewalk at the bus stop became easily crowded, especially with families and strollers getting on and off the bus. Besides this, one beggar was present, one seemingly homeless person and two very drunk persons, shouting aggressively and harassing bystanders and creating a feeling of unsafety and uncomfortableness for the observer.

During the observations in the evening, no street lights were turned on initially, only after a couple of minutes, even though it was already dark. Two officers from the Ordningsvakt were standing at the entrance of the train station for around 10 minutes, observing the space but not actively engaging with anyone. Ordningsvakt are swedish law enforcement officers, appointed by the police that have several police duties and powers and act as assistance. Overall, the demographic was mainly composed of younger people as well as middle-aged people and three families with strollers were observed. Not many bikes were observed, resulting in a relaxed atmosphere with little traffic and little conflicts. However, the majority of bikes had no lights, making it difficult for pedestrians to see them coming. After the Ordningsvakt left, a drunk person appeared on the square, making the observer feel rather uncomfortable and reducing the overall feeling of safety. Almost everyone jaywalked across the bus lane and bikes and e-scooters were also driving on the bus lane. One person with a blind guide was observed, but no obstacle could be observed as they had a partner to guide them.

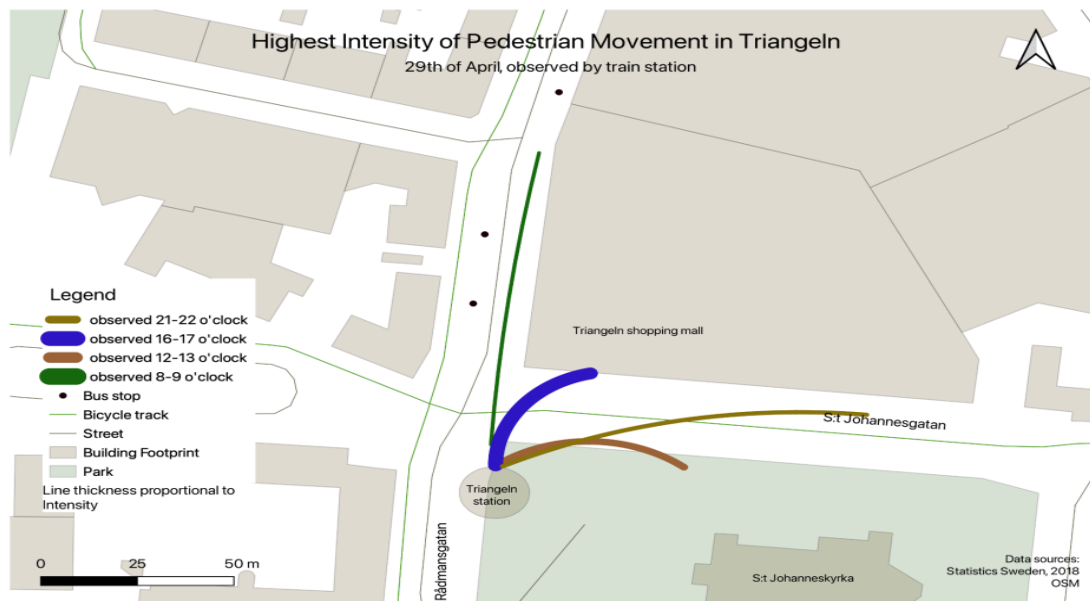


Fig. 5: Highest Intensity of Pedestrian Movement in Triangeln (29th of April, observed by the train station) (own figure).

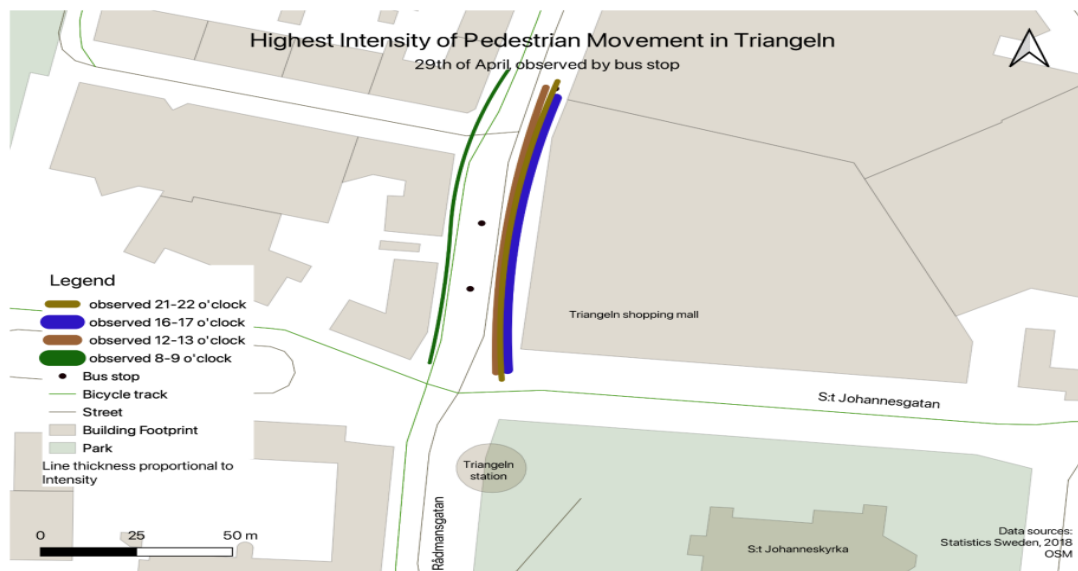


Fig. 6: Highest Intensity of Pedestrian Movement in Triangeln (29th of April, observed at the bus stop) (own figure).

Emotional Maps and Structured Interview

The emotional mapping exercise included a total of eleven participants, comprising four males and seven females. The age range of participants varied between twenty-three years old and sixty years and above, with the majority being between thirty and forty years old and sixty years and above.

To maintain simplicity, participants were provided a map of the Triangeln area and instructed to identify favourable walking routes and locations that evoke positive emotions. They were asked to elaborate on their choices by providing verbal feedback after marking each place and route on the map. The same process was repeated for unfavourable places and routes. The structured interview concluded with respondents answering several demographic questions, including gender, age, and the purpose of their visit.

Respondents were also asked to indicate where they had travelled from that day, and the results showed that they came from different neighbourhoods in the city, including Värnhem, Oxie, Skurup, Kungsgatan, Pildammsparken, and Hyllie. Two respondents reported living near the hospital, while two others indicated travelling from other cities, such as Lund and Åkarp. The purpose of their visit included transportation (five respondents) to commute to work or travel for personal purposes and leisure (six respondents) to meet friends and walk in the shopping area. The majority of participants (seven) used public transport to reach the area, while four participants walked.

Overall, the participants identified more positive features than negative ones. The number of positive routes and areas identified by the participants was twentyfive, whereas the number of negative routes or areas identified was twenty. On average, participants marked four features on the map.

Based on the respondents' assessment overlaid on the generalised map, certain stretches were universally considered "good" and associated with positive experiences. These stretches included the way on Johannesgatan towards the park (identified by five participants) and Rådmanngatan from Triangeln station towards Östra Rönneholmsvägen (identified by five participants). Conversely, the area behind the church (identified by five participants) and the section on Johannesgatan to Kapellgatan were universally marked as negative.

One area of particular interest was the entrance to the north entrance of the train station (a waiting area with benches) due to the mixed emotions it evoked. Four participants marked the area as positive, while two marked it as negative. Some respondents reported that the area was a good place to sit in the sun, meet friends, enjoy the aesthetic pleasures of the surroundings, and appreciate the modern architecture of the train station. However, others expressed concerns about safety due to the area's disorganisation and lack of signage, which leads to confusion among pedestrians and increases the risk of accidents.

The map (Fig. 7) below shows the aggregated emotional map (overlaid maps) of 11 participants.



Fig. 7: Pedestrian Perception of Triangeln. Based of Emotional Maps drawn by Pedestrians (own figure).

The pedestrians' experiences of the public space at Triangeln were varied, with mixed reviews among the participants. However, certain experiences were shared by most participants. One common perception was a sense of danger around and behind St. Johannes Church due to open and frequent drunkenness, as well as the perception of open drug trading, which led users to avoid the square, especially when alone and at night. Some participants opted to take a taxi instead of walking in these circumstances when using public transportation to and from Triangeln.

"When I have to come here at night, I take a taxi. I do not feel safe in this area."

"The area behind the church is particularly unsafe during the night, as there are often many drunk people around. I had to go to the hospital at 3:00 am and noticed that there was no police or security present in the area."

"(Area behind the church) *is not nice.*" (Does not explain further but expresses strong negative feeling.).

Fewer participants commented on traffic safety than expected, but it did come up in relation to an unclear separation between the sidewalk and bike lane, leading to confusion among participants. The bike infrastructure was seen as lacking, with bikes parked outside designated areas causing inconvenience for those working in the square. Additionally, the lack of signage and excessive speed of bikes raised safety concerns.

"(Way from Triangeln to Johannesgatan, towards the church) *When I first arrived, I found it difficult to navigate between the bicycles, and the situation remains the same when I am on my bike. It doesn't feel safe when pedestrians and cyclists share the same area without clear signage or designated crossings.*"

"The movements in this area are disorganised, with bicycles mixing with pedestrians."

"The absence of signage makes me feel unsafe, especially when going from Triangeln station to the shopping centre. This area is extremely unpleasant because of the safety issues that arise from the lack of clear directions for pedestrians. (Way from Triangeln to Johannesgatan towards the church) The presence of bicycles on the same path as pedestrians also makes walking unsafe, further adding to the discomfort of the area."

"There are a lot of bicycles moving around, and this can be confusing for pedestrians, especially on weekends when the area is busy with people. It can make it difficult to navigate and creates a feeling of unsafety due to the risk of accidents."

Those who did express positive experiences of the space, highlighted the area leading to Magistratsparken as attractive due to its greenery, restaurants, and sculptures. One participant mentioned bringing their child to Triangeln because of the presence of dogs.

"If I were to take someone on an excursion, I would definitely bring them to this place. I love the sculptures, fountains, Opera, and Concert Hall, which often have free exhibitions. Additionally, the area leads to a nice park which is a great place to relax and enjoy nature."

"It is nice with its greenery, sculptures, and restaurants."

"It is also pleasant. It leads to a lovely park and playground, and the surrounding trees and flowers add to the beauty of the area."

"It is nice. Leads to the park. Like greenery."

"This is very interesting. The greenery, sculptures, and fountain attract your attention and are aesthetically pleasing.":

Overall, the participants' experiences and perceptions of Triangeln indicated that safety and security concerns were a major focus. They expressed worries regarding personal safety, particularly during nighttime and when alone, due to the presence of overt and frequent inebriation and conspicuous drug transactions around St. Johannes Church. The absence of law enforcement or security personnel in the area, as observed during a late-night visit to the hospital, further heightened their apprehension. These safety concerns were significant enough to influence their decision-making, with some participants opting for taxi rides instead of walking.

In terms of traffic safety, participants mentioned the unclear separation between the sidewalk and bike lane, leading to confusion and potential risks for pedestrians. The disorganised movement of bicycles, along with the absence of clear signage and designated crossings for pedestrians and cyclists, added to their perception of an unsafe environment. They highlighted the need for improved infrastructure, including road signs and better separation between pedestrian and cycling areas, to enhance safety.

On the other hand, attractiveness played a relatively minor role for most participants. However, those who did mention it emphasised the positive aspects of the space. They appreciated the presence of green spaces, such as the pathway leading to Magistratsparken, which offered a pleasant environment with its trees, sculptures, and nearby amenities. These elements contributed to the overall attractiveness and visual appeal of the area. Although attractiveness was not the primary motivator for their current visit, some participants acknowledged its influence on previous and future visits, noting the presence of nice businesses, public art, and a nearby park.

In summary, the participants' experiences and perceptions at Triangeln were largely shaped by safety and security concerns, encompassing personal safety, traffic safety, and the presence of security personnel. Attractiveness played a secondary role, with participants acknowledging the positive aspects of green spaces, sculptures, and nearby amenities.

Secondary Data: Current Planning Policies in Malmö

To further investigate Malmö's stance on walking and their urban planning approaches related to walkability, planning policies of Malmö stad were analysed. Malmö's comprehensive plan states that *"The transport system should contribute to more people walking, cycling or using public transport. These means of transport should be prioritised in both local and regional traffic."* (Malmö Stad, 2018, p.13). Furthermore, the sustainable urban mobility plan states that its vision for Malmö where *"Walking, cycling and public transport are the first choice for all who work, live or visit in Malmö"* (Malmö Stad, 2016, p.10).

Walking is considered a sustainable means of transportation and serves as a viable option for the typical mode of individualised conventional commuting (Ferrer et al., 2015). Environmental design is linked to active mobility with research concentrating on examining mesoscale built environmental factors, specifically at the neighbourhood level and in relation to walking behaviour.

These factors typically include measures such as residential density, land use mix, and street connectivity (Cervero & Duncan, 2003). Other studies focus more on micro-scale built environment characteristics, such as the presence of trees, sidewalk width, and street quality, which are relevant at the street level (Ferrer et al., 2015). By analysing these factors in Malmö stad's policy, we can examine if pedestrian perspectives are considered.

While plans for Malmö wish to prioritise walking and cycling in the future, current policy documents do not prioritise the needs of pedestrians or cyclists. The Technical Handbook (Malmö Stadsbyggnadskontor, 2022) is the principle guiding document for new developments in Malmö. It is designed for developers, consultants and contractors to guide the technical aspects of building. Requirements and guidelines for new developments in the city are outlined here.

The priorities set out in the section "systematik och process" state that choices made in building should favour best quality as well as economic benefit to Malmö (Malmö Stadsbyggnadskontor, *systematik och process*, 2022). While this manual aims to outline technical specification for construction in Malmö it does not provide social considerations or requirements beyond those of accessibility, through which it references the accessibility programme Malmö (Malmö Stad, 2008).

Malmö's accessibility program outlines its current policy as: rebuilding current areas and making new areas for those with reduced mobility or orientation. They highlight that this process aims to balance interests in (re)constructing areas for accessibility (Malmö Stad, 2008).

In (re)construction public spaces to increase accessibility, practicality and cost are at the forefront of consideration. The goal is to make obvious separation of space between users of the street. Factors such as attractiveness and security are not distinctly stated in the guidelines.

Common mistakes in design of public space and in particular traffic markings are highlighted from a legal perspective where pedestrians or cyclists often lose out, for instance in losing right of way where the construction of streets implies that cars should give way to them.

While there has not been another accessibility plan for Malmö since the current one published in 2008, Malmö stad has been gradually publishing papers on various infrastructure of public space and how they relate to accessibility, such as street lighting, bus stops and playgrounds (Malmö stad, 2008). A clause on the accessibility page stating that should requirements come into conflict with the technical manual, the technical manual takes precedence. Therefore accessibility requirements can be overridden in favour of technical requirements.

In conclusion, the priorities of current design policy are primarily looking at reducing cost to the public finance while increasing long-term benefit particularly in the reduction of maintenance costs. Accessibility is seen from the lens of reducing traffic accidents for the largest perceived group on record. This begs the question as to if groups who are not walking in their trips and thus avoid the urban public spaces all together are excluded from consideration.

These planning documents outline visions for increased walking and cycling in Malmö in the coming years, however the current policy contained within the technical handbook and supporting documents contradicts this. The technical handbook and supporting documents overrides other commitments with the goal of cost saving and economic benefit.

6. Discussion

In the discussion section it is intended to delve into the findings of the study and examine their implications in a broader context. In this study, the experiences and perceptions of pedestrians in the Triangeln area have been explored, focusing on the aspects of safety, security, and attractiveness. The findings shed light on the factors that influence pedestrians' perceptions and behaviours, as well as their preferences and concerns related to the public space. This section will analyse and interpret the results, considering the implications for urban planning, design, and the overall quality of the pedestrian experience around Triangeln. Additionally, it will discuss the alignment, or lack thereof, between pedestrians' experiences and the existing planning processes.

It was interesting to find that according to the answers of the participant, safety and security concerns come first. As those two factors are met from the participant's perspective, then the factor of attractiveness is considered as important. It can be explained by Alfonzo's (2005) concept of the hierarchy of walking needs. It is based on Maslow's theory of human motivation. In this theory, individuals aim to fulfil their basic needs before moving on to more intangible and high-level needs. Alfonzo's (2005) hierarchy of walking needs follows a similar pattern, beginning with basic feasibility needs and progressing towards higher-level urban form related needs. This hierarchy includes accessibility, safety, comfort, and pleurability needs. The theory suggests that even if an environment is enjoyable, individuals may not choose to walk if their more fundamental needs, such as safety, are not met.

Perception of Safety

The definition of safety in this paper involves traffic and infrastructure safety. Safety was perceived as a secondary concern for pedestrians when using the space, but still a present issue. Six participants of varied ages and genders noted bike traffic or infrastructure as a concern. The speed and intensity of traffic was an issue and the lack of visual cues such as signage to indicate the presence of a bike lane was repeated by many as an issue.

Furthermore, the first interviewee perceived that his lack of cultural awareness of traffic norms in Sweden meant he felt even more confused and thus less safe when going between the station

entrance and shopping centre entrance. Interviewee three mentioned that insufficient bike parking meant that working on the square was more difficult. Both perceptions were unique to the characteristics of each interviewee.

No interviewee mentioned that issues surrounding vehicle traffic or infrastructure were particularly positive or negative. While the fact of Triangeln being a transport hub was the reason for travel to the urban public space, for many vehicle traffic or infrastructure was not mentioned as a reason they preferred or were attracted to the space.

To answer the research questions: Pedestrians have a slightly negative experience of safety at Triangeln as a centrally located public space in Malmö. Perceptions are that cycling traffic and infrastructure are a minor but noticeable problem. Triangeln does not stick out as a particularly good or bad example of safety in Malmö. To answer the second research question: the participants perceived safety as good enough but seeking improvement.

To answer the final research question: while the comprehensive plan and sustainable mobility plan seek to increase walking and cycling in Malmö, the requirements and guidelines highlighted in the technical handbook do not offer solutions in regard to safety issues perceived by the users of Triangeln. Therefore it would seem that in this case, pedestrian perspectives are not considered in safety requirements and guidelines at Triangeln.

Perception of Security

This paper's definition of security has two elements: infrastructure and crime. Both were perceived as poor by participants. Most participants highlight the area surrounding St. Johannes Church at Triangeln as negative due to the presence of people that were openly drunk and dealing drugs.

Infrastructure factors such as a lack of sufficient street lighting, infrequent presence of security personnel, difficulty to hail taxis, absence of people at night and many hiding spots meant that infrastructure security was perceived as sufficient during the day and very poor during the night. Many participants, particularly those with children or older in age, said they would rather take a taxi for a short distance when travelling to or from the station at night instead of walking.

Crime was perceived as a large issue here. The open use of alcohol was reported by most participants with several participants also mentioning open trading and usage of illegal substances. Threat of harassment in the area surrounding the church as well as the streets in the surrounding area led to the perception of crime related security concerns of the area.

Pedestrians therefore experience the security of Triangeln negatively, particularly at night. Security is experienced as a key issue in their decision to use the space at night. With many that were forced to use the station in the dark, doing everything they could to avoid the space at night including using a taxi for short trips that could be done in less than ten minutes.

Requirements and guidelines in the technical handbook do not include many of the security issues at Triangeln. There is nothing to make sure users feel secure in the space or provisions for minimum lighting or security personnel. Interviewee one had issues calling a taxi because of a lack of the Swedish language and so the presence of a taxi rank would be a possible consideration to boost security of the area.

Furthermore, some interviewees felt that particularly because of their gender, age or having a child, they did not feel safe at night without the presence of another and thus security can also be seen as an accessibility issue whereby the characteristic of pedestrians determines their perception of security in the space.

Perception of Attractiveness

According to the literature, attractiveness, as perceived by users, encompasses various elements, with aesthetic attractiveness being a prominent factor. Additionally, accessibility, social attractiveness, built environment, businesses, and land use contribute to the overall perception of attractiveness. Paths that traverse recreational areas are generally considered more appealing than those passing through residential areas. In the study, participants reported positive experiences in areas/routes due to the presence of greenery, parks, installations, attractive architecture, and the overall aesthetic pleasure they offered. Positive emotions were also linked to spaces where the natural environment coexisted harmoniously with the built environment, as observed in the experimental emotional maps of Mitzpe Ramon by Weinreb and Rofè (2013).

Despite previous claims by Basu et al. (2022) regarding higher attractiveness and safety while walking through recreational areas compared to commercial and mixed land-use areas, some participants in the study found areas with mixed land-use, shopping stores, and cafes attractive for walking. This suggests that the presence of these elements contributes to the overall attractiveness of the space for pedestrians.

Kamińska and Mularczyk (2021) emphasise the importance of conceptualising the urban space in relation to the perception of attractiveness. In addition to physical accessibility, visual accessibility plays a crucial role in enabling people to enter and navigate the space. In the study, one participant found a route attractive because it was easy to navigate, while another participant marked a route as less attractive due to the perceived difficulty in knowing where it might lead.

Furthermore, open and wide spaces are also perceived as attractive, as found in the research by Ferrer et al. (2015). In this study, the openness of the space was primarily associated with a sense of safety rather than attractiveness, as some participants mentioned the open space positively, highlighting it as a perceived safe area.

Effect of Personal Characteristics

Women's perception of safety in public spaces in Kolkata led to them avoiding public spaces, limiting their perception of their right to the city (Roy & Bailey, 2021). A fear of harassment in space, particularly those that were male dominated led to a lack of participation in public space. Spaces were seen as safer when a diverse range of people were present. Therefore, in making public spaces accessible to a diverse user base, perception of safety can be increased.

Holman et al. (2022) found that better upkeep and maintenance of neighbours in Milan led to a safer perception. This corroborates what our participants said in that poor maintenance and cleanliness led to a reduced sense of safety in Triangeln. The authors primarily highlight how the safety of different spaces is perceived by those of different racial groups and thus including perceptions of a racially diverse pedestrian population is important in considering safety for all in planning and in doing so attracting a more diverse public to the space.

7. Conclusion

Pedestrians experience Triangeln in Malmö, Sweden, in a variety of ways. Emotional mapping revealed that people positively perceive the areas where they feel secure, safe from traffic. Attractiveness does help people perceive an area positively but not without the space being safe and secure. Being a centrally located and complex area means the presence of a lot of traffic and people which leads to further security and safety risk.

Areas were perceived as attractive because of the mixed-use, greenery, recreational areas, and restaurants. Modern architecture and installations are also perceived as positive and stimulating the decision to walk in the area. Negative feelings are related to the areas/routes where people

consider it unsafe in relation to traffic and a lack of security measures in the area, which is particularly bad at night.

Perceived safety, security, and attractiveness of an urban public space has a significant impact on the walkability of the area. For example, the presence of clear signage and visible security personnel was reported as an essential factor for enhancing walkability. An aesthetically pleasing environment with more greenery, fountains, and installations increasing the attractiveness of the area, was perceived as an important factor to attract pedestrians to the space.

Lack of signage, security and surveillance negatively impacts the experience of pedestrians in the space and their decision to walk in the area as they reported preferring to take a taxi or avoid walking in the area at night.

From comparison with goals, requirements and guidelines outlined in Malmö stad's planning documents it can be seen that most perceived issues did not have guidelines or requirements that considered these issues or offered improvements. While Malmö's targets for the future want to increase walking and cycling, no effort can be seen to understand and incorporate pedestrian perspectives in the requirements and guidelines of Malmö stad's planning documents and thus meeting mobility goals would be challenging with current guidelines and requirements in place.

8. Outlook and Future Research

All in all, emotional mapping of pedestrian perception in a participatory and counter mapping approach can be considered as rather novel research which has not been carried out extensively. The research at hand contributed to filling this research gap and provided a first study on pedestrian perceptions of Triangeln in Malmö, Sweden. Taking this study as a base for future research and learning from the limitations described above can be a first step in repeating and scaling up this research or adapting it for other contexts. In addition, the emotional mapping exercise revealed several locations that were of interest and worthy of further observation. The findings from the emotional maps have potential to be generalized to some extent considering involvement of a diverse range of participants and conducting similar studies in different contexts to validate the emotional responses and perceptions observed in the mapping exercise. Besides this, it could also be interesting to work alongside Malmö stad to study possible improvements on the space and how they could be implemented. This would also resolve the limited data availability above and would provide a chance to study the site in more detail from different angles. Expanding on the research by interviewing planners in Malmö would give a complete picture of how pedestrian perspectives are implemented in planning. Mirroring this research in other cities in Sweden or abroad would help highlight if this is a regional or national issue.

9. Appendix

Observation

Observation Guide

Who is missing?

- age: kids, teenagers or old people
- gender
- people with disabilities (visible disabilities like wheelchair?)
- families with strollers
- ...

Physical Setting:

- What is the condition of the lights, crosswalks, and other pedestrian infrastructure, such as sidewalks? Is it even included? What is missing?
- Do physical barriers like construction areas or deteriorated pavement have an impact on how people behave on the street?
- How bad is the traffic situation, and how does it affect how people walk?
- How much noise is there in the area, and how does it affect how people walk?
- What is working/ what is good?

Pedestrian Activity:

- How frequently do people walk through this neighbourhood, and at what times of the day?
- What speed are the local pedestrians moving?
- What proportion of commuters, shoppers, or leisure walkers are there in the neighbourhood?
- What are the most popular walking routes and attractions in the area?
- What are the most common modes of transportation used by pedestrians to access the area?

Social Factors:

- What is the demographic makeup of the area's pedestrian population? → Do people actually use the accessible infrastructure that is provided? Are certain people missing?
- What social norms are apparent in pedestrian behaviour, such as jaywalking or waiting for the crosswalk signal?
- What is the amount of social contact among pedestrians in the area?
- What role do local companies or institutions play in shaping pedestrian behaviour and safety perceptions?
- What role do local businesses or institutions play in shaping pedestrian behaviour and perceptions of safety?

Other Considerations:

- How is the weather in the area, and how does it affect pedestrian behaviour?
- Are there any major events or festivals in the neighbourhood that may have an influence on pedestrian behaviour?

- Is there anything else noteworthy about the area that influences pedestrian behaviour or feelings of safety?

Structured Observation Notes

First observation: Tuesday, 25th of April 2023

The first observation day was Tuesday the 25.04.2023 and the site was observed at different times during the day and also at night. In total four time slots were selected: from 8:00-9:00 in the morning, around noon from 12:00-13:00, in the afternoon from 16:00-17:00 and at night from 21:00-22:00. The times were selected to get an overview about the usage and intensity of the site throughout the day and account for traffic flows due to commuting to work and shopping. The time slots in the morning and the afternoon account for people travelling to and from work, where the Öresundstrain also increases its frequency and departs every 10 minutes. The time slot around noon accounts for people taking their lunch break, as Swedish lunch breaks usually start at 12:00.

At Triangeln, two sites were specifically selected: the shared space between Triangeln Station and Triangeln Shopping Mall, as well as the bus stop Triangeln around the corner. These specific locations are visualised in Figure 2. For each site an observation time of 30 min each was set. The first 15 min were used to create a flow and intensity map, showcasing where people go and come from and how many people walk there. The flow and intensity maps are included below. The last 15 min were used to answer questions from the observation guide that was defined in advance and take notes on who and what was seen. The observation guide relates to issues like infrastructure and setting, pedestrian behaviour and traffic as well as composition of people.

The physical setting of the site was in an overall good condition: sidewalks run along St: Johannesgatan as well as Rådmanngatan while a little area around the street can be identified as shared space for both pedestrians and cyclists to cross it. The ground was a little dirty, mostly due to cigarettes laying around. When walking across the shared space, it seems like pedestrians and cyclists did not know who has the right of way and usually hesitantly crossed it. What is missing here could be signage or signs that give a little explanation about how to use it. Furthermore, the noise level increases the closer one is at the bus stop. Buses are coming and going all the time while people rush to work and others spend time in the area; all of it contributes to a rather high level of noise. The bus lanes are painted red which defines the space where pedestrians are not allowed to cross the street. Where pedestrians and cyclists are supposed to cross the street, kerbs are dropped.

The weather conditions that day have been rather rough: it was cloudy and really windy which made the average 8-10°C feel colder. Throughout the entire day, it had been raining lightly.

08:00-09:00

The overall impression of the Triangeln area around the train station early in the morning is that people are rushing to work. Every time a train coming from Copenhagen stopped, a big group of people left the station and rushed to the bus stops. Most of them carried bags that made them look like they are on their way to work. Regarding ethnicity and age of the majority of people taking the train around the time, they have mostly been in their late 20s to 50s and seem to have a western background. Barely any teenagers have been sighted and most of them who were there crossed the square to go someplace else. A few people walked with their dogs, but didn't take the train or bus. More cargo-bikes have been seen than people with strollers, and only one person

with crutches that crossed the bike path and nearly collided with a cyclist. No one went to the shopping mall as it opens later at 10:00 o'clock. In general, pedestrians crossed the bike path without looking out for cyclists, even though many cyclists crossed the bus lane and cycled across the square.

Generally, 2-3 buses stopped around the same time at the bus stops, creating a bulk of people getting off and walking to the station. It is noticeable that many people that leave the station go to the bus stops to take a connecting bus. Many pedestrians have been seen jaywalking, crossing the red-coloured bus lane when there is no bus in sight. Same happened when buses towards Scandic stopped: passengers got off and jaywalked right in front of it to cross the street, even though the bus was about to leave again. Even a person with crutches jaywalked there before the next bus arrived. Behind the waiting areas for buses on the northern side of the street, many cyclists and pedestrians walked, some of them with strollers. Approaching 09:00 o'clock, the number of people around the area slightly decreased.

12:00-13:00

At this time it was moderately busy. The demographic was a mix of elderly people, younger/middle aged adults with strollers with children in them and a few teenagers hanging out together. The main intensity of traffic was people walking from the entrance of the shopping mall to the entrance of the train station. A few groups of people lingered on the square including a couple young people stopping people to ask questions and those smoking cigarettes (although not in the designated area to do so). There were few issues with safety with pedestrians, bikes and buses seemingly weaving around each other without the need to stop and let others pass. Several of the elderly users of the space have variations of walking assistant devices such as a powered cart they ride, a rollator or walking stick more than half of those I see during this observation were alone and did not appear to need any assistance. Wheelchair users were absent from the space with only one user appearing during the observation who was assisted by someone pushing their wheelchair.

Nearing 13:00 many more young adults appeared in the space. I also saw a man with a toddler who he was holding the hand of as they walked through the square. I saw many people with suitcases but also those with backpacks entering the station. As time went on the space got emptier while a larger percentage of users had strollers with children in. The only noticeable people were those coming in waves as the trains arrived at the station at intervals of about 10 minutes.

16:00-17:00

During the observation in the afternoon the station and the shared space in front of Triangeln Station was very crowded, especially at 16:05. It was obvious when a new train had arrived as a new "bulk" of people exited the train station. The majority of people were identified as middle aged commuters coming from work and shoppers but also parents with kids and strollers were present, however they seemed to come to Triangeln for shopping or for leisure. Besides this, also teenagers were observed, mostly exiting or entering the shopping mall and coming or going to the bus and people with luggage coming from the bus or train. Three people with limited mobility were spotted, in a wheelchair, with crutches and a rollator. The gender ratio appeared to be balanced, however the age groups were imbalanced as children and elderly were in a minority compared to the middle-aged group. People primarily walked fast, some even ran to the station but a few shoppers were moving at a slower pace. The most popular routes were between the train station and the entrance of the shopping mall, from the station to the adjacent bus stops and from the bus stop to the shopping mall. Overall, the situation appeared to be chaotic and hectic

with people walking everywhere in any direction. There were several conflicts with the high frequented bike lane. Pedestrians seemed unsure when to cross it as many bikes cycled fast. Several pedestrians wanted to cross the bike lane and immediately jumped back when they saw a bike approaching whereas others crossed anyways and were almost run over. The same occurred with electric scooters, who were at times even faster than the bikes. One cyclist and one person on an electric scooter angrily rang their bell at pedestrians while going very fast. Moreover, one cyclist was on their phone while cycling, not paying attention to their surroundings. Bikes were also parked on the pedestrian spaces and one cyclist used the sidewalk at the bus stop instead of the bike lane on the opposite side. Children were in strollers or taken on their parents hand, often held back when crossing the bike lanes or when walking towards the bus. There was also a lot of bus traffic during that time and one bus stopped before their actual bus stop and released its passengers directly at the square at the train station. The bus stops were also very crowded and people constantly crossed the bus lane illegally, behind or in front of the buses. At the bus stop itself, people were waiting in clusters moving towards their buses as they approached. Two people with limited mobility were observed, one in a wheelchair. The space for the wheelchair at the bus stop was very limited due to all the people waiting there. This was also the case for parents with strollers. Besides this electric scooters and bikes were also driving on the sidewalk instead of bike paths.

21:00-22:00

During the observed period of 21:00 to 22:00, the area under review displayed high intensive activity. The entrance of the station and the surrounding waiting area emerged as the busiest spot, with individuals seated on benches and standing around. The flow of cyclists on Johannesgatan street from west to east, specifically from Point E to D, was particularly intense, with few cyclists observed travelling from west to north (E to B).

The most significant flow of pedestrians was observed walking from Johannesgatan towards the station's entrance. A relatively high number of individuals were observed arriving to the train station and departing towards the bus station or heading towards the Radmasgatan or west Johannesgatan (A to C and A to D), while fewer pedestrians were seen walking from Johannesgatan west to Radmasgatan (from E to B).

The shared space where Johannesgatan and Radmasgatan intersect presented potential conflict situations between pedestrians and cyclists. Furthermore, the physical settings of the area exhibited a crowded bus stop located at point C, resulting in many individuals standing outside the sheltered area. This situation could create a perception of unsafety and discomfort among individuals waiting for buses, particularly within the bus stop's crowded confines. While in terms of physical settings street lighting was available, the sidewalk and bus stops were not deteriorated, lacking a shelter at the bus stop (point B) provided minimal protection against the wind, causing possible inconvenience for individuals waiting for buses.

In terms of the demographic makeup of the area, adults with mixed ethnicities were the most common individuals observed during the given period. Notably, there were no individuals with special needs or disabilities present during the observed period. Additionally, no children were present.

Second Observation: Saturday, 29th of April 2023

The second observation has been done on Saturday, April 29th, following the same schedule as the previous observation. Therefore, observations have been carried out from 08:00 to 09:00, from 12:00 to 13:00, from 16:00 - 17:00 and from 21:00 - 22:00 o'clock.

It was rather warm that day as the sun had been shining which made the average 9-20°C feel warmer. It was significantly colder in the shadow.

08:00-09:00

The overall atmosphere of Triangeln at the train station early in the morning was quite calm and quiet. Very few cyclists crossed the square and the bike racks further away from the station have been almost empty. Three parents with strollers have been sighted. People leave and go to the station every now and then but they are coming from all directions. There is no clear connection between the train station and the bus stop. Most of the pedestrians that are walking around in Triangeln don't take the bus or the train, but cross the square for other purposes instead. Some people sit on the big plant pots in front of the station and play with their phone - most of them did not take any train but left to go somewhere else afterwards. Occasionally, a bigger group of people (2-4) get off the bus and walk with their suitcases in their hands to the train station. Five to six people cross the square with their e-scooters and every few minutes, a runner have been sighted that crossed the square. Overall, it is not much going on and the loudest noise is coming from seagulls. By the end of the observation, more people have been hanging out around the plant pots and more and more people are heading towards the train station carrying suitcases.

The area around the bus stop is even emptier than the square in front of the train station. Sometimes for minutes, no one is walking on the sidewalk behind the bus stops or is crossing the bus lane. No one jaywalked over the bus lane and not too many buses came and went. A Flyggbussarna stops and a big group of people (approximately 15-20) are getting off, heading to the train station with their suitcases and backpacks. Almost all the few people that have been seen take the sidewalk behind the two bus stops, a couple of families with their strollers among them. One cyclist is cycling on the sidewalk on the side of the street where no bike lane is. Even when nearing 9, not much is going on around the bus stops.

12:00-13:00

During the 12:00-13:00 period, the area remained busy, with the entrance of the station and its surrounding waiting area being the busiest spot. People were seen sitting on the benches or standing around. The most intensive flow of cyclists was observed on Johannesgatan Street, heading from the west towards the entrance (Point E to A) and vice versa. People arrived at the station and left towards the bus station or continued heading towards the west part of the street (points A to C and D). A significantly high number of people were walking from Johannesgatan to the entrance of the shopping mall (E to F). There was also a high number of people heading towards the shopping centre and leaving from the shopping centre towards Radmasgatan (F to B). There was a high probability of potential conflict situations between pedestrians, cyclists, strollers, and scooters around the entrance of the train station and waiting area. The physical setting of the area was overcrowded, particularly the waiting area around the entrance and the bus stops located at location C and B, where many people stood outside the sheltered area. There was no deterioration of the sidewalk or bus stops. The demographic makeup of the observed individuals was mainly adults, including some people with special needs or disabilities, several families with kids and strollers, and individuals going to the shopping centre.

16:00-17:00

At that time mostly shoppers and middle-aged people could be observed but also more parents with their children. The children even walked alone more often. The atmosphere appeared to be more relaxed with people walking at a slower pace. People were talking or sitting in groups and interacting more with each other. Also, fewer bikes were present, and the overall square was less busy than during the week. However, the cyclists still drive wherever, on the sidewalk and crossing the square without really paying attention to pedestrians. But more cyclists were

observed that were pushing their bike and thus moving at a slower pace. There were so many bikes parked near the station and a few bikes were blocking parts of the pedestrian space. A few people were running to catch the train but way less in comparison to Tuesday. The biggest flow of people was towards the shopping centre or alongside the shopping centre and a peak was observed at 16.00 with a crowd of people exiting the train station. A few people with luggage were observed, other than that some teenagers were skating and a couple of dog walkers. One person with a crane and one with crutches were observed and few elderly people were present. Generally, pedestrians were able to cross the square without problems due to the reduced speed and quantities of bikes. Moreover, fewer buses were driving by. At the bus stops there were also more families with strollers or little children and middle-aged people and the bus stops were less crowded than on Tuesday. Pedestrians still crossed whenever and wherever but due to the reduced number of buses, this was less dangerous at that time. More people with shopping bags than luggage were observed and most pedestrians walked towards the shopping centre. It was less busy, but still the sidewalk at the bus stop became easily crowded, especially with families and strollers getting on and off the bus. One wheelchair user was observed and one older person with a crane. Additionally, e-scooters were driving on the sidewalk and on the bus lane. Besides this, one beggar was present, one seemingly homeless person and two very drunk persons, shouting aggressively and harassing bystanders.

21:00-22:00

When arriving at Triangeln station at 21:00 in the evening, no streetlights were on and the overall square was only illuminated by a big advertising screen above the entrance of the shopping mall. The street lights turned on a couple minutes later. Two officers from the Ordningsvakt were standing at the entrance of the train station for around 10 minutes, observing the space but not actively engaging with anyone. Ordningsvakt are Swedish law enforcement officers, appointed by the police that have several police duties and powers and act as assistance. Overall, the demographic was mainly composed of younger people as well as middle-aged people and three families with strollers were observed. The majority of people were walking in groups and few people had luggage while more people were holding shopping bags and seemingly finishing their shopping day. The train at 21:05 releases the biggest crowd of people onto the square with the majority going to the nearby bus station to continue with their journey. Not many bikes were observed, resulting in a relaxed atmosphere with little traffic and little conflicts. However, the majority of bikes had no lights, making it difficult for pedestrians to see them coming. Also, e-scooters did not always have their lights turned on. After the Ordningsvakt left, a drunk person appeared on the square, making the observer feel rather uncomfortable and reducing the overall feeling of safety.

At the bus stop, a peak was observed shortly after the train of 21:05 arrived and also around 20:30. The majority of people were middle-aged people or younger people, appearing to go out or coming from events or finishing their shopping day. One person with crutches, very few families and a few people with luggage were observed. Generally, fewer buses arrived than during the daytime, resulting in longer waiting times and two people smoking inside the bus stops during their wait time. Almost everyone crossed the bus lane "illegally" when and wherever. Bikes and e-scooters were also driving on the bus lane instead of the attached bike lane. The police drove by around 21:40 but just passed the bus stop. One person with a blind guide was observed, but no obstacle could be observed as they had a partner to guide them and the overall number of pedestrians was low.

Intensity/ Flow maps (sketches)

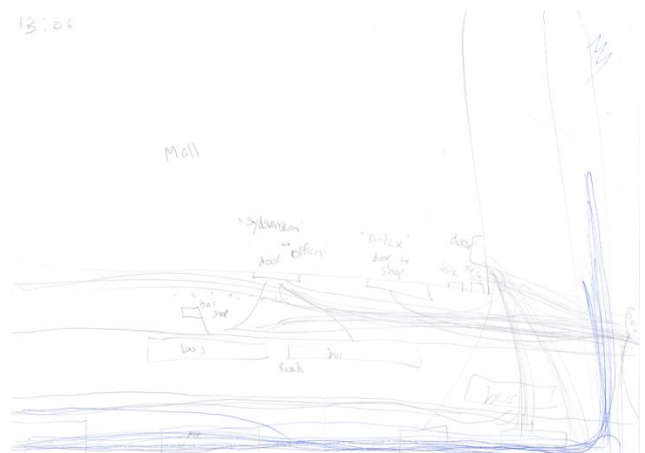
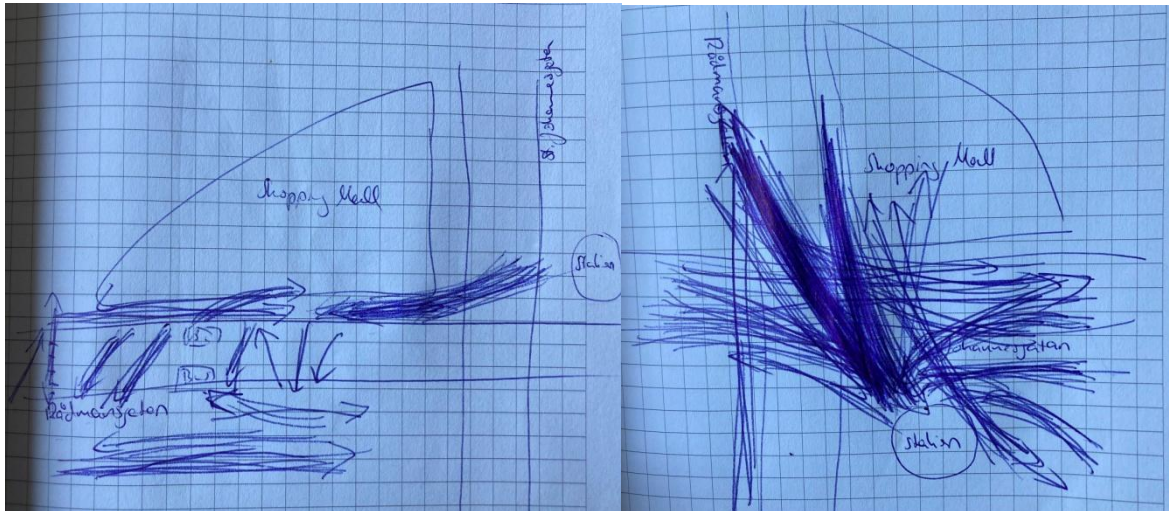
Instructions:

- draw a line for each person walking (with arrows)
- note down conflicts that you see
- we select a specific spot where we stand and observe

Figure 3: Flow and intensity maps

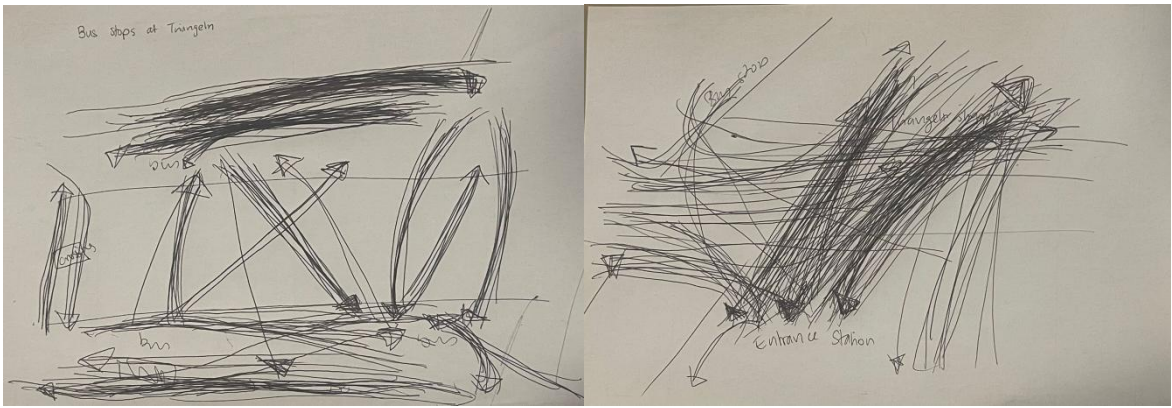
I. Tuesday, 25th of April

Tuesday, morning 08-09:00

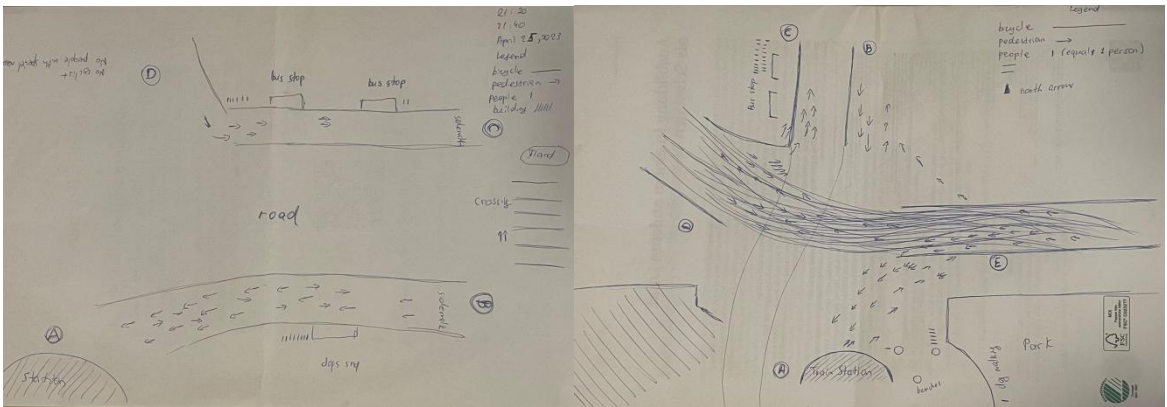


Tuesday, noon 12-13:00

Tuesday, afternoon 16-17:00

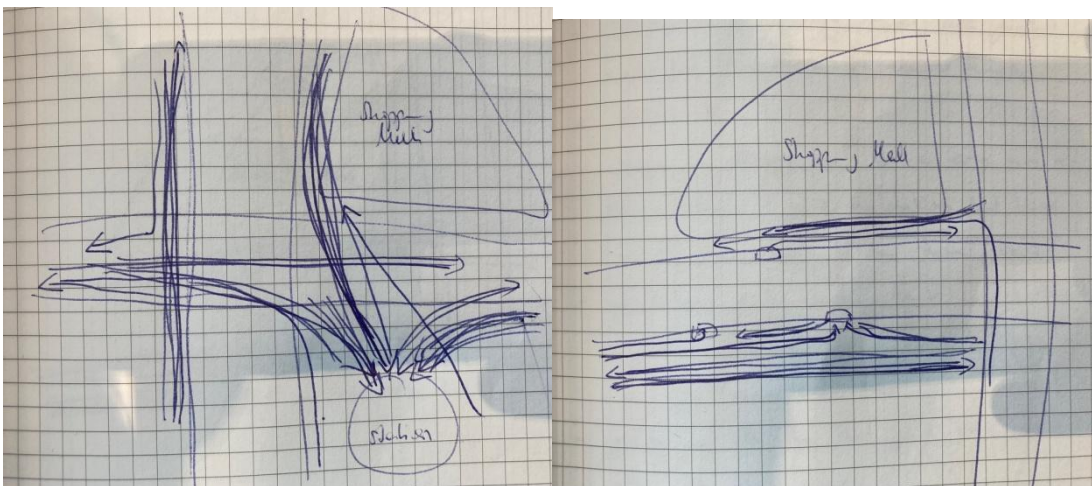


Tuesday, night 21-22:00

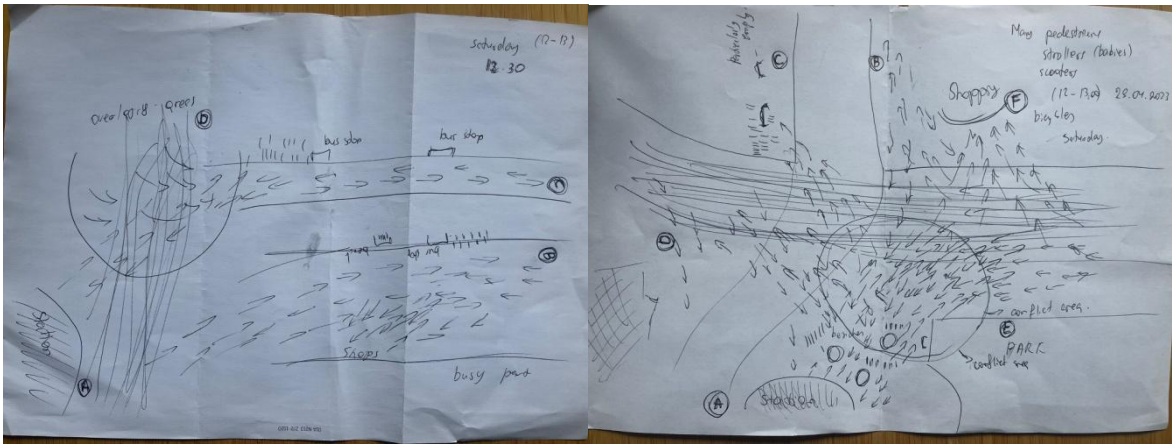


II. Saturday, 29th of April

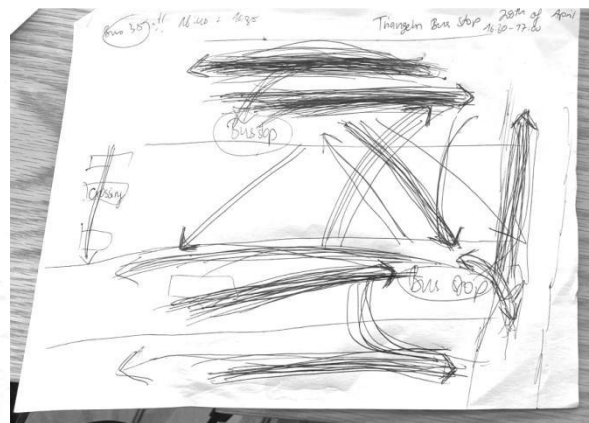
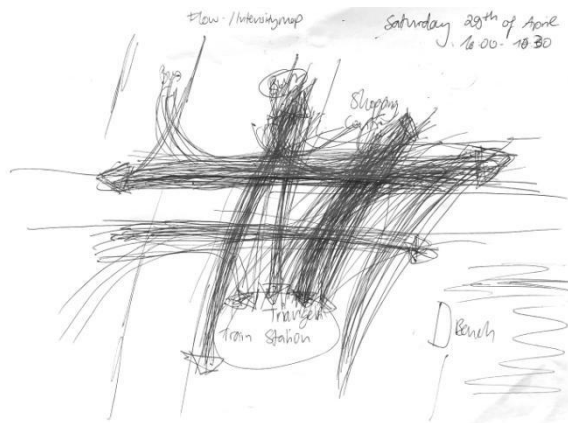
Saturday, morning 08-09:00



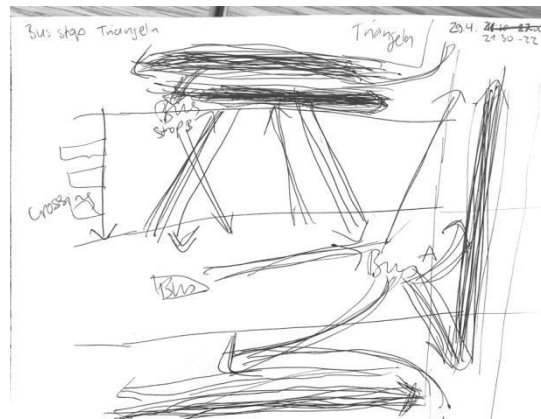
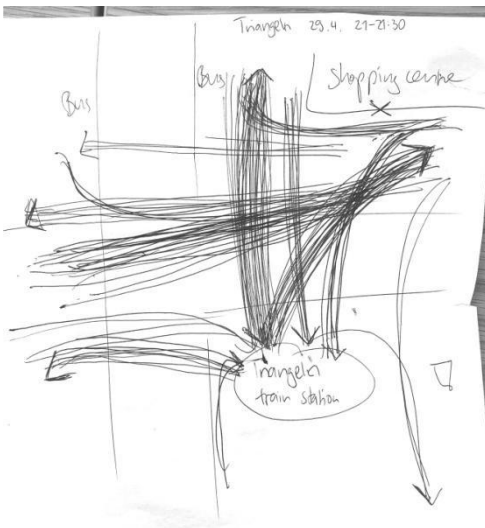
Saturday, noon 12-13:00



Saturday, afternoon 16-17:00



Saturday, night 21-22:00



Emotional mapping of Triangeln: Interview Questions and Map Exercise

About us: Who are we and what do we want to research?

We are researchers from Malmö University and we are doing research about pedestrians' perceptions of Triangeln and how easy, nice and safe it is to walk. Our goal is to promote or improve the quality of walking in this space. Could we ask you a few questions about the place? It will take like 10 minutes. It will be anonymous and not recorded.

Questions:

1. Age Groups

20 - 30

30 - 40

40 - 50

50 - 60

60 - above

Answering for my child

2. Gender

Male

Female

Other

3. Where are you coming from/ where are you headed to? (mark it on the map)

4. What brings you to Triangeln today or in general? Why are you walking here mainly? Leisure, going to work etc.

5. How did you come here? Bike, walking, public transport, other

By bike

By foot

By bus

By train

By E-Scooter

By Taxi

6. How do you feel about this space in general? Why? Does it change during the night and how?

Mapping your experiences of Triangeln:

We would like to capture your feelings towards Triangeln and how you perceive the space. There is no right or wrong, we try to explore how do you feel about the space. Starting points can be issues like **safety and security as well as attractiveness** but you can also add other factors. Please draw how you feel during the day, below you can add your feelings for the night as well.

Routes: **blue: positive** **pink: negative**

Particular area on the route: **yellow: extremely positive** **orange: extremely bad**



1. If you marked a route **blue**: why do you perceive it positive?

2. If you marked a route **pink**: why do you perceive it negative?

3. If you marked an area **yellow**: why do you perceive it so positive?

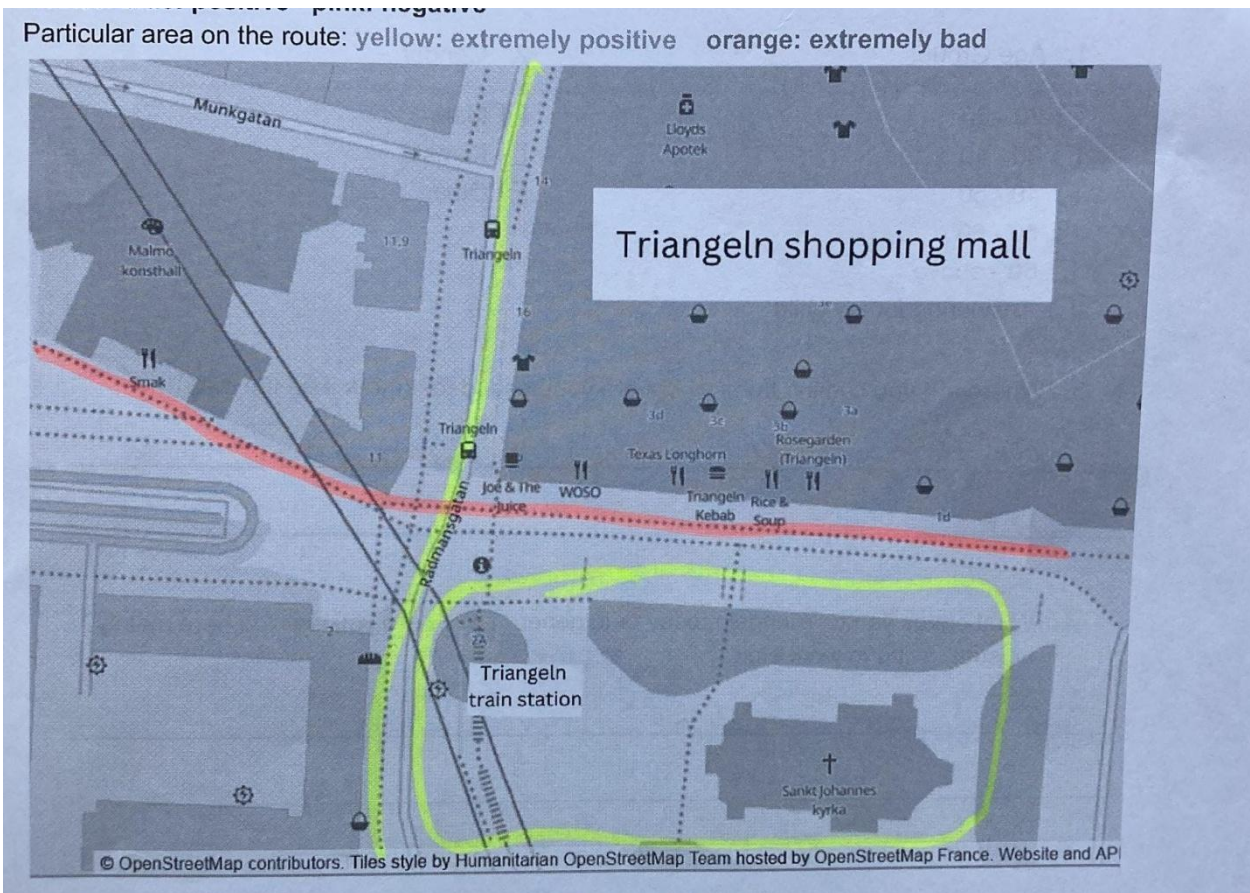
4. If you marked an area **orange**: why do you perceive it so negative?

5. Feeling at night?

6. What would you like to change?

Other factors

Figure 7: Example of Emotional Map Drawn by the Participant



Results of Structured Interview

Participant nr.	Age group	Gender	Where are you coming from/headed to?	What brings you to Triangeln today? Why are you walking here mainly?	How did you come here?	How do you feel about this place in general? Does it change during the night and how?	If you marked a route blue. Why do you perceive it positive?	If you marked with pink: why you perceive it negative?	If you marked Yellow: why you perceive it so positive?	Feeling at night?	What would you like to change?	Other Factors
Participant 1	30-40	Male	From Hyllie to Triangeln. Staying to play on the playground with his kid.	For leisure to bring his kid	By train	In general, I like the area. I come here often to take my kid to play on the nearby playground with our dogs. However, the area around the entrance of the station is not very pleasant. There are no organized bicycle lanes, and it can be confusing for pedestrians as there are no zebra crossings. When I first came here [to Sweden], I was stressed because I didn't know how to navigate through the cyclists.	I marked the route as nice because of the availability of buses, trains, and various transportation means that make it convenient. The bus stops are conveniently located and provide comfortable seating. The way on Johannesgatan (towards the park) is also pleasant. It leads to a lovely park and playground, and the surrounding trees and flowers add to the beauty of the area.	The absence of signage makes me feel unsafe, especially when going from Triangeln station to the shopping center. This area is extremely unpleasant because of the safety issues that arise from the lack of clear directions for pedestrians. (Way from triangeln to Johannesgatan towards the church) The presence of bicycles on the same path as pedestrians also makes walking unsafe, further adding to the discomfort of the area.	Flowers and greenery, nearby park, shopping street.	The area behind the church is particularly unsafe during the night, as there are often many drunk people around. I had to go to the hospital at 3:00 am and noticed that there was no police or security present in the area.	It would be helpful to have road signs that provide clear directions to both pedestrians and cyclists, as this would help to improve safety in the area. Additionally, there should be more measures in place to enhance security, such as increasing the presence of police officers to deter criminal activity and ensure the safety of residents and visitors alike.	
Participant 2	60 and above	Female	Comig from area near the hospital. Going to Kalmar.	To take a train.	By taxi	Not that nice. Crime and accidents. I would not come to this area alone at night. There are many alcoholics behind the church.	(The way on Johannesgatan, towards the park) is nice with its greenery, sculptures, and restaurants.	There are many alcoholics behind the church. I would not come here during the night.		When I have to come here at night, I take a taxi. I do not feel safe in this area.	Increased security, more security guards.	

Participant 3	60 and above	Male	Coming from (North of Malmö) to work.	To work	By bus	This is a newly developed area and it's quite nice. There is a lot of movement with buses and bicycles, and it only takes two minutes to get to the Central Station. (At night) everyday is a surprise here. Some crime accidents happen sometimes.	(Area to the right of the entrance) Many people come here to meet each other, which is good for my work. There is a lot of movement in this area.	(Way from triangeln to Johannesgatan, towards the church) The movements in this area are disorganized, with bicycles mixing with pedestrians. The area behind the church is not nice.		(At night) everyday is a surprise here. Some crime accidents happen sometimes.	improved bicycle parking and more benches in the alley with trees.	
Participant 4	60 and above	Female	Coming from area near the hospital. Going to Kalmar.	Leisure. To meet friends	By foot.	The area is nice. Coming here to meet friends and take public transport.	(The way on Johannesgatan, towards the park) is nice. Leads to the park. Like greenery.	(Area behind the church) is not nice. (Does not explain further)		(Area behind the church) is not nice. (Does not explain further, but expresses the strong negative feeling)		
Participant 5	20-30	Female	Coming from Pildammsparken to Radmasgatan. Going to shopping street (Sodra Forstaden)	cafes and coffee shops. I often take this route because it feels familiar to me.	By foot.	I really like this area for its convenience for commuting and the variety of shopping options. It's also easy to access different parts of the city from here. While I don't have much experience with this area at night, I don't think it changes much. However, as someone who isn't much of a night person, I don't often visit this place after	I love taking the route along Radmansgatan to get to the city center, not only because it's convenient but also because it gives me aesthetic pleasure. The area around the entrance, where there are benches, is particularly beautiful, with views of the trees, flowers, and the church. I also appreciate the modern glass architecture of the station.	(Way from triangeln to Johannesgatan t, towards the church) When I first arrived, I found it difficult to navigate between the bicycles, and the situation remains the same when I am on my bike. It doesn't feel safe when pedestrians and cyclists share the same area without clear signage or designated crossings. I also have an aversion to the area behind the church as it feels empty and difficult to navigate. During the day, it lacks vitality and	(The way on Johannesgatan , towards the park) If I were to take someone on an excursion, I would definitely bring them to this place. I love the sculptures, fountains, Opera, and Concert Hall, which often have free exhibitions.	There are always people around, and there is enough lighting to make me feel safe. Since it is an open space, I don't usually have any safety concerns. However, I would avoid walking near the trees at night.	To make it more attractive. adding some features such as art installations, fountains, and cafeterias. These additions would enhance the overall atmosphere and make it a more enjoyable destination for me to visit.	Aesthetic values: Flowers, Installations, trees to bring more colours.

						dark		it's challenging to know where it might lead.	Additionally, the area leads to a nice park which is a great place to relax and enjoy nature.			
Participant 6	30-40	Female	Coming from Farsteboplan, going to Lund	Transportation. To take a bus, train or walk to the city centre (library, Gustav Adolph Torg)	Train	I like this place. It is quiet and comfortable. When I want to go somewhere for leisure from Lund, I decide to come here. I choose this location because I feel safer here compared to Malmo C, and Hyllie station is always extremely windy. That's why I prefer to come here if I have to decide on a train station.	(Mixed feelings about the way from Triangeln to Johannesgatan, Church) I like this route because it is interesting and leads to the main shopping street that I visit quite often. This road is familiar to me, and I feel comfortable taking it. Besides, there are nice cafes where I can stop.	(Mixed feelings about the way from Triangeln to Johannesgatan, Church) There are a lot of bicycles moving around, and this can be confusing for pedestrians, especially on weekends when the area is busy with people. It can make it difficult to navigate and creates a feeling of unsafety due to the risk of accidents	(The way on Johannesgatan, towards the park) This is very interesting. The greenery, sculptures, and fountain attract your attention and are aesthetically pleasing.	Come here very rarely to take a train. Do not feel any discomfort.	It would be helpful to have road signs for bicycles or pedestrians. Additionally, a sign for a public toilet that is nearby would be helpful as well. If you don't know the exact location, it can be impossible to find. This is especially important for people with kids. It would also be nice to have a drinking fountain. Although not common in Sweden, in my opinion, it would be very convenient to have in busy public spaces like Triangeln	Safety is the first priority, which means having fewer cars around. When I decide whether to walk or not, my first consideration is safety, followed by aesthetic pleasure. The area should be interesting, not just attractive - this is an important distinction. The combination of

												sculptures, churches, glass architecture, shopping malls, and other elements all together make the area interesting
Participant 7	20-30	Female	coming from Kungsgatan in the Inner-City (Komvux) and heading to Oxie (home)	sitting on a bench and enjoying the sun with a friend. it is convenient that the station is nearby. usually, I take a bus or train from here to go to work/Komvux	by foot and train	I like it. It is a public space where everyone can sit, especially during summer. at night it depends on: if I am alone it is a little scary but it is ok if I am here with friends.	there is usually many people here and it is an open space which is why you can see everything.	i feel less safe if there is less people around. especially when its dark. and especially in the courtyard behind the bus stops since it is barely connected to any street.		there is a difference between summer and winter, but I usually feel unsafe if there is not so many people around.	the square is perfect as it is. not dirty.	the place is great because it serves as a meeting point for people.
Participant 8	30-40	female	Coming from Komvux at Kungsgatan, going to Triangeln Shopping Mall and square	for leisure, meeting with friend	foot	The area is nice with the benches and its nice in the sun. Its lively and nice when people are out. Also there is no direct traffic so its calm and not dangerous. At night it is still okay here and not scary.	Its a nice space to sit in the sun and to meet friends	The smoking area is dirty and could be cleaner. Bikes could also be slower but I am always paying extra attention here so it is okay for me.	benches	Its okay, I still feel safe at night there are a lots of lights.	Bikes could be slower and smoking area could be cleaner.	
Participant 9	50-60	male	i am coming from Skurup and i am on my way back there, since i live there but work in the	for work, need to walk to the station	by train	i really like it, it is crowded. but it is a little dangerous with the bicycle track; it seems like a troubled spot.	the lights are good especially at night. open space and not many hidden place are good. no cars.	water sites would be nice for stimulation		I feel safe all the time	better system for bikes, signs for example. other signs don't really say anything and the	water fountain for stimulation

			city.			what is also nice is the shopping mall and the greenery around the place.					infrastructure for bikes should be better.	
Participant 10	30-40	male	Coming from Oxie, going to Triangeln and Malmö C for fun	for leisure and going to the train	train	The space is very nice, enjoying the atmosphere. No bad things during the day but it changes at night. At night it is not safe because there are strange people that approach you.	It is safe during the day but not at night.	At night it is not safe because of strangers, especially during the weekends.	The place is lively and good for families to enjoy.	Not safe due to strange people.	The place should be more secure and safe that would be better for the people. The problem are strange people and people asking for drugs. Maybe more policy security is needed.	
Participant 11	20-30	female	From home so from Värnhem to Triangeln for meeting here, go back home after	for leisure, getting a coffee with a friend	foot	It is good during the day but not at night time. A lot of alcoholism and drug abuse.	It is all okay during the day but nothing super positive.	Alcoholism and drug abuse and open or public drug dealing.	Nothing super positive its all okay.	Not really unsafe but uncomfortable, a lot of "weird" people.	More surveillance	

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Figure 1 & 2: Allan, A. (2022). OpenStreetMap. <https://www.openstreetmap.org/>

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