PARKING GARAGES AS SPACES OF OPPORTUNITY

An Analysis of Overlooked Nodes as Potential Spaces for Adaptive Reuse

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ABSTRACT

Parking garages belong to the basic inventory of today’s cities, however their existence and contribution to the urban fabric is marginally discussed under the urban themes of structural transformation, environmental underperformance and socio-cultural fragmentation. This thesis is a study of parking infrastructure in the inner-city of Malmö with a particular focus on rooftops as spaces of opportunities for a sustainable urban development.

The thesis aims to investigate whether an integration of parking garages into the urban fabric of their local environment can contribute to a more equal, mixed-use city development through adaptive reuse of the rooftops as public green spaces.

Based on a literature review on public space transformation, urban green spaces, its threats and services and an investigation of a specific case study, this thesis identifies parking garages as potential spaces to compensate a lack of urban green and public environment. The study of possible integration of public and green services into the existing structures of parking garages is performed on the level of a city wide analysis, as well as in a particular context of a central district in Malmö.

The study shows that the location of parking garages within network nodes of an increasingly mobile society and fragmented city structure could be strategic locations for additional uses. Furthermore an evaluation of parking garage usage has confirmed, that stand-alone, open-roof structures have been affected by vacancy, specifically in the upper floors due to decrease of demand for car parking in the central parts of Malmö. Finally this study concludes that parking garages are overlooked nodes with further potentials for adaptive reuse.

KEY WORDS

Parking Garage, Multi-Storey Car Park, Public Space, Green Space, Adaptive Reuse, Urban Transformation, Malmö, Lugnet, Sustainable Urban Development
European cities are undergoing rapid transformation processes of deindustrialization, economic globalization and climate change (Madanipour et al., 2014). Facing an increasing urbanization, social fragmentation, climatic threats and a global competition between cities the concept of sustainable urban development has been set on the planning agendas of urban metropoles.

The city of Malmö is an appropriate example for a middle sized European city, and is formulating a change of paradigm in urban planning and design of the physical environment. This is achieved through a conscious construction of a new city image developing from an industrial city to a sustainable city of knowledge. The visionary work comprises physical development according to the principles of a sustainable urban development. The transformation of the urban fabric is intended to support new forms of compact city life by incorporating mixed use, collective services and green spaces into the existing infrastructure (Malmö OP, 2012). With an aim of continuous densification the city planning is in search of new approaches and alternative forms to allocate and mix a plurality of services at neighborhood level. Moreover the city is investing in the expansion of public transport services and biking lanes throughout the city districts. These interventions give reason to believe, that the number of car ownership and individual motor traffic will decline steadily, proved by a decreasing share of car traffic on the modal split of the city (Malmö SMILE, 2009).

As a consequence of the motorization of traffic, parking garages belong to the basic inventory of today’s city (Hasse, 2007). In Malmö, the construction in the inner city parking garages started with the first wave of motorization in the 1960’s to increase the accessibility of the inner city and at the same time contribute to a car-free street environment (Malmö Stadsbyggnadskontoret, 2002). From the 1960’s the growing number of vehicles got functionally and spatially concentrated in an increasing number of mono-functional and standalone parking garages. In many ways, parking spaces are already being described as spaces of transit, often perceived as inanimate non-places (Augé, 1995). In this context, challenges but also opportunities of reconceptualization of car parks need to be investigated.

1.1 RESEARCH PROBLEM AND AIM

Despite the above mentioned change of paradigm in urban planning and large investments in public transport and bicycle lanes the built environment and urban life in the inner-city of Malmö is characterized by a large amount of traffic and car parking. This includes street parking, underground car parks and particularly multi-storey car parks. Privately owned motor vehicles have a share of 51% in the modal split of the city, hence the car is the main mean of transport in the city (Fryklander, 2014). In addition the inner-city of Malmö is dominated by large retail and shopping infrastructure, however it faces a lack of urban green and public spaces (Kärreholm, 2009). The lack of green and public spaces is increasing with a growing population and ongoing densification of the built environment. Further, extreme weather events, such as heavy rains,
storms, and urban heat islands are increasing environmental problems in the city (Malmö Stad, 2014).

The contribution and existence of parking garages in cities has not been discussed under the urban themes of structural transformation, environmental underperformance and socio-cultural fragmentation. This paper aims to analyze parking garages as possible spaces of opportunities for physical redevelopment and multiple-use environments. The mainly mono functional, multi-storey stand-alone structures provide a solid substance for analyzing possible additional services such as public and green spaces. Consequently this study formulates the following research questions:

**Are parking garages overlooked nodes in Malmö’s planning strategies towards a sustainable urban development?**

**What are the opportunities and challenges of integrating green and public functions onto the existing structures of parking garage roof tops?**

1.4 PREVIOUS RESEARCH

Parking garages belong to the basic inventory of today’s cities. However their existence and contribution to the urban fabric has been marginally discussed and analyzed in contemporary urban research and in regard to sustainable urban development.

Literature and research are mainly dealing with parking garages as profane service architecture, focussing on their economic and technical aspects, e.g. cost benefit analysis, security aspects or challenges in construction and maintenance (Tighe & Van Volhinburg, 1989; Arnott, 2006; McConnell, 2008; Kurz, 2004).

A cultural historical review of parking garages, compiled by Jürgen Hasse (2007) has been crucial for this thesis to understand and reflect upon the parallel development and transformation of city life and parking garages, as an entirely new achievement in mobility during the early years of the 20th century, to a modern comfort and subsequently a necessary implicitness of contemporary cities.

Since the burgeoning of criticism of ‘the functional city’ during the 1960’s the boundaries of a rationally structured city and its individual parts have been renegotiated (Smithson & Smithson, 1957; Mumford, 1967; Jacobs, 1961). Urban concepts for a redistribution and accumulation of green and public space in cities have been discussed (Gehl, 1971; Burton et al., 1996). Adaptive reuse, urban recycling and change of use of mono-functional and disintegrated architecture or service infrastructure has remained enduringly relevant in the current architectural and urban planning discourse (Baum & Christiaanse, 2013; Dell, 2011; Guggenheim, 2008; Zukin, 1982). The consequent discussion on Everyday Urbanism as a shifting entity of space production and reproduction has put the active user back into the center of urban (planning) discourse, capable of defining, redefining and changing the collective perception of a physical place through interaction and use (Certeau, 1984; Lefebvre, 2003; Latour, 1993).
However, the analysis of parking garages as spaces for a sustainable urban development in times of structural transformation, environmental underperformance, socio-cultural fragmentation have not been conducted. Urban paradigms discussed under such terms as ‘post-carbon society’ and ‘compact city’ set the task to challenge and rethink the prevailing concept of parking garages as mono-functional space-provider for a car driven urban society.

2 METHOD

The major methodological work in this study is based on qualitative research. Hence the research is not only conducted to amass data, “the purpose of the research is to discover answers to questions through the application of systematic procedures” (Bruce, 2004). The research refers to the meanings, concepts, definitions, characteristics, metaphors, symbols and descriptions of things” (Bruce, 2004). An Arc-GIS analysis is the only quantitative research method used in this study. Quantitative research refers to counts and measures of things (Berg, 2004).

The following chapter is describing the field, object and limitations of the study followed by a description of the research methods.

2.1 FIELD AND OBJECT OF STUDY

The field of study is the analysis of parking garages as overlooked nodes for public green spaces. This field is chosen since parking garages are not yet issue of urban planning and development discussions and seem as overlooked, while at the same time being basic structures in the urban fabric and in the course of urban renewal processes. The selection of parking garages in relation to urban green and public spaces as the field of study evolves through the researchers personal interests in exploring alternative and overlooked urban environments.

The object of study is a parking garage in Malmö, in the district of Lugnet. Malmö was chosen as a transforming city under large population growth and redevelopment processes with progressive city strategies and vision concepts, based on a dynamic historical background as an industrial city. In the course of the master programme, excursions and discussions on Malmö’s development provided a fertile ground for theoretical interpretation and knowledge production. Therefore it seems natural to deepen the research and analysis of this master thesis in Malmö and in relation to the city’s strategies. On the one hand this might limit the horizon and increase the risk of bias of the study. On the other hand, Malmö as a middle sized city is a good example of urban renewal with significantly large number of parking garages and therefore suits the object of study.

Using the example of the district Lugnet in Malmö and its parking garage P-Huset Anna as a case study, it is possible to trace back several stages of development of local neighborhoods,
residential areas and public spaces beyond the historical part of Malmö. Primary attention has been given to Lugnet’s constant physical transformation throughout the process of Malmö’s urbanization. In many respects Lugnet offers a substantial ground for a descriptive analysis of various planning intentions contrasted with individual and collective perceptions, with regard to the changing role of public space and pressures on green structures in the transforming city.

A case study as a methodological approach includes several data-gathering measures, e.g. observations, interviews and surveys (Berg, 2004). With regard to the particular study of provision of green and public spaces in relation to the parking garage P-Huset Anna in Lugnet, a case study aims to manifest interrelations of significant factors, such as historical background, Malmö’s city development strategies and contemporary urban themes. Therefore a case study can “serve as the breeding ground for insights and even hypotheses that may be pursued in subsequent studies” (Berg, 2004).

2.2 LIMITATION OF THE STUDY

Apart from a best practice example from Berlin the thesis is particularly focussing on Malmö and its parking garages in relation to the city’s planning and urban renewal strategies. This geographical limitation was chosen due to personal experience and knowledge about the city and good access to data and interview partners.

The study is analyzing to what extent parking garages can provide additional functions such as green or public space on the top floor. However the study is not including a technical discussion of a parking garage’s concrete infrastructure and how green or public spaces could be technically applied on the top floor.

The study focus is put on considerations entrenched in social cultural theory and environmental sciences due to the field of interest of the researchers. The interdisciplinary study aims to investigate possible social and environmental benefits, difficulties and challenges in the processes of adaptation of parking garages to the envisioned strategies of a compact and mixed-use urban environment. In the given context of the study, economic and legislative aspects, e.g. benefits and challenges of multifunctional and cooperative modes of site management between the private parking space provider and possible facilitators could not be included.

2.3 PRIMARY DATA

The contribution and existence of parking garages in cities has not been discussed under the urban themes of structural transformation, environmental underperformance and socio-cultural fragmentation. Therefore, and in order to base the thesis on a profound basis of empirical data and opinions on the transformation and conversion of parking garages, interviews as primary data with experts and responsible from the city planning and traffic department have been included in the study. Moreover primary data was collected in the course of 20 randomly conducted interviews in the area of Lugnet and on site observations and documentations.
2.3.1 INTERVIEWS

This thesis includes four interviews, of which two have been semi-standardized and two unstandardized. Semi-standardized interviews are structured but include flexibility in wording of questions, the level of language and adjustability to possible interventions of the interviewer to make clarifications and remove or add questions (Berg, 2004). In this thesis the interviewees of semi-standardized interviews with the planning architect Kenneth Fryklander and sales manager from P-Malmö Christian Dahling received a brief project description and an outline of questions before the interview was held. Therefore the interviews were structured in advance but flexible for possible changes and adjustments in situ. Semi-standardized interviews were chosen when the interviewee was limited in time, hence the respondent could prepare for the interview.

The unstandardized interviews, with one of the initiators of the best practice example Klunkerkranich, as well as the former city planning architect Olov Tyrstrup were unstructured and had no order of question and wording, thus total flexibility in language and questions by means of situative communication. In particular the combination of observations and walking interviews facilitates a maximum flexibility for both parties. The interview partners can respond directly to the occurring events and observations (Berg, 2004; Evans & Jones, 2011), while the interviewers can include the actual field experience in the questionnaire. The unstandardized interviews were chosen when the interview was held outside and a flexible and unstructured form of the interview were more profitable for the data collection.

A walking interview as a mobile methodology can provide further advantages and richer data than secondary data and conventional expert interviews (Evans & Jones, 2011). The interview participants are less likely to give a strategic correct answer and just answer affected by meanings and connections to the surrounding environment and urban landscape.

For further information about Malmö's city strategies and visions in relation to parking garages an interview with city planner Kenneth Fryklander was held in the city planning department of Malmö. Since most of the official information and promotion material on the municipality's websites is in Swedish, an additional interview was helpful in order to clarify emerging questions and avoid possible misunderstandings.

A walking interview with the former city planning architect Olov Tyrstrup in the area of Lugnet was part of the primary data collection. Tyrstrup was in charge of writing and elaborating the general city plan (Swedish: Översiktsplan) during the 1970's. Hence, he was responsible for the division of planning processes, housing, traffic and road systems and green spaces. In particular for further information about the area of Lugnet and its demolition and modernization processes in the 1970's, Tyrstrup could provide valuable information and insight in the planning processes at that time. The interview was held due to a lack of secondary data about the modernization processes in Lugnet and further historical planning developments in Malmö.

The interview with Klunkerkranich initiator and gardening expert Christian Kühner was held during a study visit of the best practice initiative in Berlin. Detailed notes and a photo documentation have been made by both interviewers. Open questions about the formation of the idea, specifically with regard of the chosen site, the actors involved, the implementation...
process, the daily routines and the actual benefits for locals, users and facilitators, have provided a holistic picture of a specific cooperative private-private initiative on a parking garage roof-top. During the tour, possible solutions for building, greening, species protection, water management, as well as security regulations and waste management have been shown by means of practical examples and projects on site.

2.3.2 SURVEY WITH LOCALS AND RESIDENTS

“Qualitative researches are concerned with how people think and act in their everyday lives” (Taylor, 1998). In order to illustrate the perception of public and green spaces and the opinion about parking garages, this thesis includes a survey of 20 randomly chosen pedestrians and cyclists in the area of Lugnet. “Particularly when investigators are interested in understanding the perceptions of participants or learning how participants come to attach certain meaning to phenomena or events, interviewing provides a useful means to access” (Berg, 2004). The interviews were semi-standardized interviews with a structured order of questions, however adjustable to the situation, interest, ability and the respondent’s willingness to participate. The interviews were conducted in English, hence the knowledge of English set a precondition for a conversation. Questions considered actual everyday uses, as well as individual and collective perceptions of the public space in Lugnet and the parking garage P-Huset Anna. All interviews have been conducted in the course of 3 weeks, while variations of daytime and weekdays were considered to base the analysis on a broad variety of daily routines co-organized in time in the area.

2.3.3 BEST PRACTICE EXAMPLE: KLUNKERKRANICH

Best Practice is a method and practical approach for dissemination and implementation of project results (EU Life, 2014). Evaluation and Application of best practice examples can stimulate a knowledge-based, sustainable development. Best practices are relative, hence they are dependent on context and time. Since adaptive reuse as a distinctive approach in urban renewal has not been yet adequately theorized (Guggenheim, 2008), a practical example should provide background information and comparative material for the analysis of the study object. The information gathered by means of a walking interview with one of the initiators has been interpreted and enriched through a participant observation. The choice of the Best Practice project has been made on the base of consistently positive media coverage.

2.3.4 ON SITE OBSERVATION AND DOCUMENTATION

“In qualitative methodology the researcher looks at settings and people holistically. People, settings, or groups are not reduced to variable but are viewed as a whole.” (Taylor, 1998). Therefore, several participant observations by means of dense descriptions of activities in the open public areas of Lugnet, (Geertz, 1983) have been conducted in the course of 3 weeks, while variations of daytime and weekdays were considered to base the analysis on a broad variety of daily routines in the area. During the descriptive phase, the observations have been noted. During the focussed phase, an additional photo documentation of the district’s public realm, e.g. the walking and biking path,
a pedestrian intersection with the promenade on Kungsgatan, two playgrounds, a café with outdoor space and an open space with sitting accommodation opposite the former market hall, has been performed to support and enrich the main arguments collected in the interviews.

2.4 SECONDARY DATA

Secondary information and data has been collected and compiled by other parties. Subsequently the information is archived and published in municipal reports, on official web pages, in guidebooks and presentations (Kamins, 1993). The main advantages of the use of secondary sources are cost and time factors. The use of secondary data allows inclusion of more than just one source in the study, hence it allows a broader research (Bryman, 2008).

2.4.1 INFORMATIONAL & PROMOTIONAL MATERIAL & NEWSPAPERS

In particular official promotion and information material published by the municipality of Malmö was included in the study in order to illustrate the city’s strategies and vision concepts of a sustainable city development and consequently base the analysis of the actual structure of parking garages on a broader municipal discourse of a compact, mixed-use city. Further promotion material by the parking space provider P-Malmö and articles from local newspapers were included in the study.

2.4.2 GEOGRAPHIC INFORMATION SYSTEM ANALYSIS

The mainly qualitative research was supported by quantitative research with Geographic Information Systems (GIS). In order to analyze and visualize the location of parking garages in relation to green and public spaces a mapping and measuring with ArcGIS was included. The use of GIS allows to manage and measure a large amount of data and can function as a starting point for further research and on site investigation in an area. The data for the ArcGIS analysis was provided by the County Administrative Board, Länsstyrelsen.

Based on an orthophoto, an own definition of categories of land use and aerial picture interpretation the green spaces and parking garages in Malmö were mapped. Subsequently the green spaces were subdivided in green areas and green surface areas based on their size. With the use of the buffer-tool and euclidean distance the proximity of parking garages to green areas was illustrated. Further the height of some of the parking garages was measured in order to illustrate the viewshed from the top floor of the parking garage in comparison to the viewshed on ground floor. The maps are included and further described in the analysis in chapter 7.

2.4.3 HISTORICAL MAPS

In order to analyze the development of parking space and modernization processes of the built environment several historical maps and general plans were included in the research. The maps
are provided and archived by the municipality of Malmö. In particular tourist maps from the 1940’s until the 1980’s were useful in identifying the development of parking space since these maps show visitors very clearly access to parking.

2.5 LITERATURE REVIEW

The literature review is based in the field of urban studies and thematically divided into green spaces and public spaces as the main issues of the formulated research problem and in connection to the conversion of parking garages as spaces of opportunities. The literature search was carried out with the help of the online library catalog of Malmö University and Google Scholar. Further literature and relevant materials were found in several library catalogues including: Landesbibliothek Wiesbaden, Senatsbibliothek Berlin and UDK-Bibliothek Berlin. The literature was chosen on the basis of professional knowledge and experience of the researchers and suggested by the thesis supervisor Per-Markku Ristilammi.

3 THEORY

The following theoretical framework consists of three parts. First a cultural historical review of parking garages is illustrating the development of parking garages and its altered relationship to its users and the urban environment. Second, theory on urban green spaces, its ecosystem services plus social and cultural benefits are presented in order to analyse parking garages as possible structures for urban greening. New forms of urban green spaces and their ecological and social benefits are described to illustrate some possible opportunities for converting the top floor of parking garages. Finally the third part of this chapter is describing the transformation of public spaces in urban settings. In the context of ongoing processes of privatization and commodification of public environment, everyday practices can reclaim alternative spaces for public on the inside of an economized public life.

3.1 HISTORICAL DEVELOPMENT OF PARKING GARAGES

Parking garages are a consequence of the motorization of traffic and their infrastructural function is primarily the disposal and parking of cars (Hasse, 2007). Although this is a subsidiary function, parking garages are a clear and visible structure of the urban fabric in an aesthetical and atmospheric perspective. However today, the contribution and existence of parking garages in cities is not discussed under the urban themes of structural transformation, environmental underperformance and socio-cultural fragmentation. They are means to an end and never target of a trip or visit to a city.
3.1.1 PARKING GARAGES AS A NEW URBAN FORM

In the beginning of the 20th century the parking garage was a strong symbol of technological progress and modern achievement (Hasse, 2007). The garages were part of the new culture and wave of the automobile and individual motor traffic. The designing and constructing of parking garages was a new form of building and function in the city. Therefore the attention and expectations of the building and the consideration for its design and architectural values were much higher than in later times. In addition the construction of a multi-storey car park posed a variety of technical challenges for engineers and architects, characterized by economic risks and uncertainties.

In the 1920's to 1940's the use of garages was limited to a specific, high class clientèle due to high acquisition costs for a car and enormous rents for a parking space in a garage (Merki, 2002). Hence, garages expressed a symbolic status to meet the demands of an affluent clientele. In addition to the service function of parking a car, the garages had to provide further services in order to maintain and repair the susceptible vehicles (Hasse, 2007). Car wash systems, repair shops, gas stations, specialized shops for spare parts and in many cases even accommodation or entertainment facilities, such as hotels or casinos were integrated parts within the garage. Heating and security service reinforced the impression of a status, that Hasse describes as a home of the car.

Steel, concrete and glass as primary building materials, as well as clear forms of the building symbolized progress and modernity. Due to uncertainties of the development of the automobile and technical challenges in the construction and maintenance of the building, the investment in parking garages was of high risks and the investors relied on additional functions provided within the garage (Hasse, 2007).

3.1.2 PARKING AS A MASS PHENOMENON IN 1950'S AND 1960'S

In the 1950's and 1960's the role and status of parking garages changed to a necessary implicitness of inner cities, due to an increasing number of cars, a car oriented design and city planning and consequently a larger number of parking garages (Hasse, 2007).
The architectural work and design were limited to construction of functional buildings without aesthetic claims, apart from a few exceptions. In many cases the results were brutal, standalone concrete structures, excluded from any architectural discourse and consideration. Moreover the multi-functionality of parking garages got increasingly limited to functional parking space.

Already in the 1950's and 1960's urban planners identified the emerging problems of the amount of parked cars on ground floor level, in the streets and in open parking spaces, harming the flow of traffic and using up enormous and valuable space in the inner cities (Sill, 1951; Sill, 1961). The multi-storey parking garage in contrast was considered to be an ideal and necessary solution to densify and create additional parking spaces in the city. Sill (1961) claims that cities had to adapt and invest in a larger amount of parking garages to solve the increasing problem of congestion.

At the same time the success of commercial activities in the center was increasingly depending on available and adequate parking spaces in close proximity. This phenomenon was a natural result of a modernistic planning, fragmentation and disconnection of the different functions in the city, such as living, working and leisure, which resulted again in a dependency on the automobile to move between the different spaces. Finally the city planning of the 1950's and 1960's was largely characterized by an adaptation to the car and its scale which included an increasing construction of parking garages (Hasse, 2007). Jan Gehl (1971) describes the design and planning adaptation to the needs of cars as quick architecture. Car oriented design is characterized by large spaces and scales of the built environment, adapted and oriented to the speed of cars.

3.1.3 EMERGING CRITICISM OF THE MOTORIZATION OF CITIES IN 1970'S AND 1980'S
In the 1970's and 1980's the construction of parking garages in cities was ongoing. The speed and dynamic of the city's development with an even further increasing number of vehicles required new parking garages in order to solve congestion and traffic problems in the cities. The design and functions of parking garages were not developing and changing in these decades. However, computer technical improvements led to largely automated parking garages without additional staff. Further, the users of parking garages got additional information, for instance the amount of free parking spaces in a garage. Nevertheless, the parking garages constructed in the 1970's and 1980's were standalone, mono-functional buildings (Hasse, 2007).

However the parking garages were indirectly influenced by an upcoming ecological movement and awareness raising of environmental damage caused by human behavior (Hasse, 2007). The car was no longer just a symbol for positive values such as freedom and autonomy. In particular in the end of the 1980's it was increasingly associated with negative attributes such as environmental pollution, energy dissipation, loss of forests and unlivable streets etc. (Worthmann, 1989; Hasse, 2007). Consequently, the ongoing criticism and a changed spirit of that time affected the design of newly built parking garages and necessary renovations of the garages built until the 1960s. Hasse (2007) describes the architecture as an aesthetical moment of self-denial. In particular green facades and climbing plants proved to be an ideal instrument to superficially reevaluate, cover up and distract from the deteriorating reputation of the car and parking garages. Hence, the idea was that facade greening could increase the social acceptance of parking garages (Hasse, 2007).
3.1.4 AESTHETICISATION AND RENAISSANCE OF PARKING GARAGES SINCE THE 1990’S

Since most of the large inner city parking garages were built between 1960 and 1980 with ferroconcrete, the 1990’s were characterized by renovation and further aestheticisation of aged and affected structures (Hasse, 2007). This included renovations of the facade, interior painting, illumination, elevators and staircases. Hasse (2007) speaks about a general trend of aestheticisation in cities including parking garages.

Moreover in the last decade a large number of new parking garages have been built, but under different conditions and determining factors than in the previous century. The parking garages from the 1950’s to 1980’s were attended to solve increasing traffic problems and congestion, thus were a subsequent action. In contrast the newly constructed parking garages are part of reintegrating the residential function in inner cities or new urban development projects, hence they are prematurely planned. The habitation of inner cities and new developed districts needs to be attractive by providing parking spaces in close proximity. In addition Hasse (2007) describes that parking garages have to meet aesthetical claims and are an issue of architectural debates and competitions. Nevertheless to a large extent, parking garages remain monofunctional from ground floor to top floor with no additional services or alternative uses included.

3.2 GREEN SPACES IN URBAN SETTINGS

In order to base the analysis of parking garages as possible green spaces on a theoretical background this chapter is presenting different concepts and theory on urban green spaces, its ecosystem services, social and cultural benefits. Further contemporary threats on urban green spaces and consequent countermeasures, thus new forms of urban greening will be introduced.

An urban environment is primarily made by humans. It consists of natural, semi-natural and artificial networks with multifunctional ecological systems at all spatial scales (Sandström, 2002). Urban green space can be defined as “planned or unplanned remnant, intact patches of vegetation embedded in the urban matrix, planned spaces such as parks or restored areas, and abandoned or derelict sites that are slowly being colonized by pioneer plant species” (Perry, 2010). The definition might be expanded by water bodies and marine environments.

3.2.1 ECOSYSTEM SERVICES OF URBAN GREEN SPACES

Urban population benefits from a variety of ecosystems, such as trees, lawns, parks, urban forests, cultivated land and water bodies (Bolund et al. 1999). Green spaces generate various ecosystem services and have a significant impact on the quality of life in the city. Ecosystem services are defined as goods and benefits delivered, provided, or maintained by natural resources, that humans obtain directly or indirectly from ecosystem functions (Costanza et al., 1997).
Urban green spaces have a significant effect on the thermal comfort of the city by cooling the air in its surroundings, regulating the micro-climate and reducing the risk of urban heat islands (Honjo 1991; Bolund et al. 1999). Another important service is the air filtration and reduction of pollution (Mayer, 1999). Further Bolund et al. (1999) mention noise reduction, rainwater drainage, sewage treatment and recreational and cultural values as ecosystem services in cities.

According to Tzoulas et al. (2007) green infrastructure maintains the ecosystem health by conserving and enhancing biodiversity. There are a number of ecological, social and economic arguments, suggesting that biodiversity needs to be protected and conserved (Beatley, 1994). Nevertheless, the ecological value and biodiversity differs between the green structures. For instance large green areas are providing a bigger habitat and basic structures for diversity than a few single trees on a private parcel (Mansfield, 2005). Further a functional network of green spaces is needed to maintain the ecological values of an urban landscape (Sandström, 2006). Although the mitigation of emission inside the city is limited, urban green spaces can be seen as one contributor to decrease the carbon footprint of cities if they are combined with promotion of footpaths and cycling (Strohbach, 2012).

3.2.2 SOCIAL AND CULTURAL SERVICES OF URBAN GREEN SPACES

In particular on a neighborhood level green spaces, for instance a green backyard or lawn can provide a common habitat and space for social interaction (Kazmierczak, 2013; Zhou et al., 2012). Hence, by sharing the green spaces with a number of users a feeling of community can be encouraged. Essential for the provision of social and cultural services of green spaces is the distance to its users (Koppen et al. 2013). According to the Norwegian Institute of Public Health (2009) the number of visits to a recreational area is reduced by 56% if it is further away than 500m from people's home. The average maximum distance people walk to get to a recreational area is around 10 minutes (Koppen et al. 2013).

Many of epidemiological, experimental and survey studies have shown that urban green infrastructures have an effect on human health and well-being (Tzoulas et al. 2007; Lee et al., 2011, Ulrich, 1984). Tzoulas et al.'s (2007) study shows that: “green infrastructure can provide healthy environment and physical and psychological health benefits to the people residing within them”. By promoting physical activity and exercises, green spaces lead to physical health and well-being. Furthermore, according to Ulrich (1984) the passive viewing of green spaces enhances psychological health and well-being. Finally the active interaction with green spaces and nature plays a crucial role in children's cognitive, emotional, and social well-being (Wells and Evans, 2003; Perry, 2010). Further studies illustrate that green spaces and vegetation lead to a lower levels of fear and less aggressive and violent behavior, hence reduce crime (Kuo and Sullivan, 2001).

3.2.3 URBAN GREEN SPACE UNDER PRESSURE

Ecosystem services and benefits of urban green spaces are increasingly threatened or have a loss in quality and function (Kremen et al., 2005). Urban areas are proportionally the fastest growing type of land use, therefore urban green spaces are under enormous pressure. Especially in cities,
where the demand for land is increasing, open green spaces are subject for residential and commercial development projects (Tajima, 2003).

The ongoing fragmentation of habitats and biodiversity in densely populated landscapes is one of the key pressures on green structures and consequentially on its provided ecosystem services and social dimensions (Di Giulio, 2009; Saunders et al., 1991). Landscape fragmentation interrupts the bonds and ties between natural resources and communities. Especially car oriented infrastructure within a neighborhood might present barriers to humans. A high fragmentation of the everyday landscape can cause difficult conditions for pedestrian activities, diminishing the accessibility of public green spaces and discouraging its use.

3.2.4 NEW URBAN GREEN STRUCTURES

Facing the emerging environmental and climatic problems, an increasing urban population and consequentially demand for, as well as fragmentation and erosion of green spaces and its ecosystem services, new forms and structures of urban green have been developed and analyzed. The following paragraphs are briefly illustrating these new forms of urban green structures.

Green roofs are covered with vegetation and soil, often supported by additional layers, such as waterproofing membrane, root barrier, drainage or irrigation systems (McKendry, 2011). Green roofs have a variety of advantages for the building and its proximate surroundings (Getter and Rowe, 2006). First, the additional layer of insulation and absorbing of heat leads to lower heating and cooling costs, hence increases the energy efficiency and improves the thermal performance of the building (Niachou et al., 2001). Second, rooftop vegetation has a cooling and absorbing effect, thus reduces the risk of urban heat islands and cleans the air from fine particulate matter and carbon dioxide. Third, the total amount of sealed surface in the city is reduced and the roof can absorb and store a large amount of rainfall and stormwater run-off. Furthermore green roofs provide an additional habitat, maintaining and improving biodiversity, have an aesthetic improvement of the urban space. Furthermore it protects the roof from harsh weather and increases its lifespan (Getter and Rowe, 2006; Carter and Keeler, 2008).

Similar to green roof, Vertical green structures, such as green façades and living walls can provide the same functions and services but in the vertical form (Dunnett and Kingsbury, 2004; Preiss et al. 2013). Through evapotranspiration the plants cool the air around the building and an extra insulation of the façade is provided (Pérez et al., 2011). Therefore the vertical vegetation is a passive system for energy savings but has also positive effects in noise reduction, air purification, maintenance of the building, as well as provision of habitat for insects and birds. In particular in dense urban areas vertical green systems can improve the environmental conditions, but also in regard of a cost- benefit analysis be economically sustainable (Perini and Rosasco, 2013).

Pocket parks are different green structures of the smallest type of park, often in dense, fully developed inner-cities. They can provide the same ecosystem services as larger green structures, just limited to a local and smaller scale and they have the same public health and social benefits, in particular on a neighborhood level (Le Flore, 2012). The unique advantage of pocket parks is that they can be integrated into the urban fabric where a more traditional, larger park would
never be feasible. They are located in close proximity and easy accessible for people to satisfy their daily need and demand of a green environment. A number of pocket parks in inner cities and larger green spaces can form an interconnected network of urban open spaces which would have positive effects on the urban habitat structure (Ikin et al., 2013).

*Urban gardening* is the process of growing plants of all varieties in an urban environment. There are several types of urban gardens and therefore different words for similar concepts. The concept of Urban Garden is a blanket term for the different kinds of gardening activities that are taking place in the city with origin in a private initiative. The common denominator for what is described in the concept is the activity and the hefty action in the gardening (Eco Life). The administration of the garden is not of importance for the definition and can vary depending on the legal right to the land for the garden or if the land is appropriated. The intervention in urbanity seen as urban gardens exists in a wide range of scale, from a private plantation around a street tree to a plot at a brown field transformed into a vegetable-producing garden by a community (Boström, 2013).

The underlying motifs for urban gardening are connected to a will of citizens to take care of the city's and their everyday environment, to have a meaningful free time and to create a place for social activities and meeting in the neighborhood. The action of gardening has a more or less outspoken political agenda where the objective is to reclaim, use and shape the city after the own preferences by transforming the existing environment and adapting it to the their needs (Goethe Institute, 2014).

Different types of urban gardening from traditional agriculture to modern methods as hydroponics are today debated as concepts of self-sufficiency for a growing urban population. Additional benefits to provision of a local source of food are the cleaning of air, taking care of runoff water, air cooling and limiting the effect of heat islands, as well as increasing the amount of accessible greenery for city dwellers (National Geographic, 2014).

3.3 TRANSFORMATION OF PUBLIC SPACE IN URBAN SETTINGS

In order to analyze parking garage top floors as possible spaces for public encounter a literature review on transformation of public life and its spatial dimensions in cities was considered. Particular focus has been put on the changing nature and disintegration of cities public spaces in the processes of urbanization and globalization. The social dimension of publicness, as well as practices of everyday life have been particularly relevant to understand the processes of public space production.

3.3.1 DIMENSIONS OF PUBLIC SPACE IN THE CITY

In urban planning, public space is generally defined as an open and accessible space of encounter, including streets, parks, squares and other publicly owned and managed outdoor spaces, as opposed to the intimate private domain and working place (Sennett, 2010; Tonnelat, 2010). A broader definition understands public spaces as “crossroads, where different paths and trajectories
meet, sometimes overlapping and at other times colliding” (Madanipour et al., 2014). Social science disciplines further extend the dimension of public space to any spatial accumulation of individuals, such as transportation facilities, where no distinctive access restrictions would regulate the influx (Tonnølat, 2010). In addition so called ‘Third Places’ (Oldenburg, 1989) such as cafés, restaurants and general stores have been described as non-traditional public settings, where the dualism of private and public as a delimiting key element of public environment would be for the first time called into question (Jacobs, 1961; Gehl, 1971). As new social centers, privately owned places such as shopping malls have been broadly discussed as commercialized public spaces, essential for community vitality, offering a new environment open to the public (Leong, 2001; Chung, 2001). Despite the defined openness and accessibility as crucial criterions for collective representations and attribution of a symbolic meaning to space, social norms of interaction and in many cases specific rules imposed by city authorities have been acknowledged as critical components of public space governance.

3.3.2 SOCIAL DIMENSION OF PUBLIC SPACE

“The social public realm is where shared understandings are constructed, which in turn structure interactions with others (e.g., behavioral norms), permitting the cultivation of individual and collective identities and the emergence of culture” (Neal, 2010). Cities are spaces of frequent interactions and contact with strangers, hence public spaces are of crucial importance and are necessary for the construction of shared understanding and agreements. Through the performance and interaction with strangers with multiple overlapping roles, individual identity and consequentially distinct cultures and cultural practices emerge (Neal, 2010).

In a more micro-spatial, urban planning perspective on public space, particularly the studies by Jane Jacobs (1961), Jan Gehl (1971) and William H. Whyte (1980) have illustrated and discussed the social role and advantages of public space and its manifold relations to social life in cities. Jane Jacobs with „The Death an Life of Great American Cities” (1961) was one of the first critics of the modernist architecture and planning. Both Jacobs and Gehl have been advocating for a reflection and reconceptualization of the contemporary city, widely spread and separated by functions. They drew their inspiration from traditional city centers, distinguishable by mixed-use architecture and a sufficiently dense population, mainly created through buildings arranged in short blocks, mixed in terms of age and design and primary uses allocated in the ground-floors. Gehl and Whyte based their analysis of urban space on human behavior in micro-publics, such as the public plazas and squares. Their urban ethnographic and behavioral studies of urban life between the buildings and of actual use of urban places contributed to a better understanding of the interrelations of material structures and public behavior. Since then urban design has been widely recognized as an active component to enhance enjoyable social order, where regular casual encounters in public space could form a basis for stronger community ties and stabilize the structure of social relations (Cattel et al., 2008; Gehl & Gemzoe, 2000). Public spaces in this context reappeared as main contributors to human well being and quality of life in cities (Beck, 2008; Cattel et al., 2008).

In particular the concept of ‘compact city’ is a popular solution for sustainable city planning and strengthening the role of public spaces (Burton et al., 1996; Gehl, 2010; Jacobs, 1961). Inspired by
the model of historic, densely developed European cities, the concept has taken form as an urban planning movement with core concepts such as ‘New Urbanism’ and ‘smart growth’. Its prominence and transdisciplinary recognition shaped what is today called a ‘sustainable paradigm of urban planning, architecture and municipal agendas.

The compact city promotes high residential density with mixed land uses and short walking distances. Therefore it limits the dependency on the car, hence decreases the emission of greenhouse gases, requires less infrastructure and valuable land and promotes walking and cycling (Gehl, 2010, Burton et al., 1996). Consequently the intensified land use and dense population enhance a vibrant urban life and provide opportunities for social interaction, a feeling of safety and stronger community ties (Jacobs, 1961, Gehl, 2010). Nevertheless the effectiveness of the compact city in achieving a sustainable city development is questioned and discussed by a variety of scholars (Burton et al., 1996; Neuman, 2005), which cannot be covered by the present study.

3.3.3 COMMODOIFICATION OF PUBLIC SPACE UNDER NEOLIBERALISM

The previously mentioned discourse on urban design as an attractor of a certain kind of public life, led in following years to a (re-)investment in public spaces. Improvements were on the top of the agendas of cities authorities, private developers and urbanists. According to Madanipour (2005), one of the main reasons behind the new interest in improving public spaces lies in the promotion of cities in a global market. In the age of global competition and fluidity of capital, cities try to be attractive and distinctive destinations to encourage the investment and (re-)allocation of these mobile resources, such as financial investors, tourists, cooperates, creative classes. Since the public sector has given most of the responsibility and ownership of buildings to private developers, the urban infrastructure and public realm are its main focus.

A further challenge lies in the growing political-economic interdependency dominating the processes of provision, supply and management of public realm (Madanipour, 2005). The structural changes in the global economy led to fundamental conceptual restructuring and transitions in cities and its public spaces. Since the mid 1970's political powers increasingly focused on stimulating economically productive activities by attracting private investments on site rather than investing in social housing or public facilities (Fainstein, 1991). This market- and economically oriented policy is still increasing in contemporary cities by using new strategies in order to strengthen the cities competitiveness (Dannestam, 2008). Based on David Harvey’s (1989) ‘Entrepreneurial City’ a number of researchers have identified a new trend of growth oriented policies and economization of the local governments (Brenner & Theodore, 2002; Dannestam, 2008). This shift from governmental, to managerial and further to entrepreneurial modes of shaping urban spaces has imposed a dominating influence of market oriented forces and private cooperates organizing contemporary cities and consequentially public spaces (Brenner & Theodore, 2002; Harvey, 1989; Harvey, 2005).

The structural economic changes in cities have led to substantial social effects and challenges which are threatening the social dimension of public spaces. Lefebvre (1991) among others describes the privatization of public spaces as a major threat to the life of cities and its public
spaces. The increasing economic liberalization and restructuring of cities has led to crucial social consequences such as segregation, polarization and wider gaps between rich and poor which affects the social dimension of public spaces. As described above, Lefebvre (2003) has illustrated a dissolution of the ‘social object city’ by an increasing homogenization and commodification of social public space.

3.3.4 DECENTRALIZATION AND DISSOLUTION OF THE CITY

„I’ll begin with the following hypothesis: Society has been completely urbanized. This hypothesis implies a definition: An urban society is a society that results from a process of complete urbanization.“ (Lefebvre, 2003:1)

The persistent discourse on dislocation and erosion of the cities specific urban entities goes back to the late 1960’s when the first common concerns about the developing complexity of the urban condition have been described in terms of a radical change in the collective perception of social reality under the process of ‘complete urbanization’ and the emergence of a ‘global city’ (Lefebvre, 2003). In the course of expansion of big metropolitan centers due to a global extension of the so-called free market under political liberalization, an interconnected world-pattern of spaces of circulation, consumption and communication led to a transgression of the previously existing spatial boundaries as a spread of urbanization on the world level (Augé, 1992).

An analysis of the rise of a new western space perception has been made during a lecture given by Michel Foucault in 1967 to the Circle of Architectural Studies. Following the traces of the history of space, Foucault first introduces the spatial categories of ‘localization’, ‘extension’ and ‘emplacement’. As consecutive, paradigmatic figures of the transformation from a medieval, pre-industrial, to a historical, industrial and subsequently post-industrial, post-historical space, the categories supply a corresponding conceptual key to the spatial ordering of the old city, the modern metropolis and the post-industrial sprawling megalopolis (Dehaene & De Cauter, 2008: 24). The traditional spatial organization of a city as a hierarchical and relational ensemble of places, clearly distinguishable between private and public, sacred and profane, urban and rural, have been undergoing a radical change of delocalization during the epoch of industrialization when the perception of space expanded by the recognition of an infinite and infinitely open space defined by motion. The second paradigmatic shift has been achieved in the wake of globalization, when the ‘End of History’ (Fukuyama, 1992) has been spatially reflected by the limits of chronological arrangement through time and overcome by the predominance of a systemic character of spatial co-organization:

„The present epoch would perhaps rather be the epoch of space. We are in the epoch of simultaneity; we are in the epoch of juxtaposition, the epoch of the near and the far, of the side-by-side, of the dispersed. We are at a moment, I believe, when our experience of the world is less that of a great life developing through time than that of a network that connects points and intersects with its own skein“ (Foucault, 1986: 22).

In the course of a historical shift from an absolute, inner-bounded to a relative, open and atopic space, the „concept of the city no longer corresponds to a social object“ (Lefebvre, 2003: 57), can thus
no longer be grasped as a definable unit (Schmid, 2012) and has therefore to be analyzed from the perspective of an emerging urbanity (Lefebvre, 1991). The crisis of the city and its conceptual reframing as the urban has been defined by the Lefebvrian core concepts of mediation, centrality and difference. The complete urbanization of society tends to eliminate the urban level of mediation between the global and the local being increasingly marginalized through the processes of homogenization of the world-city and city-world (Augé, 1992) by a global free-market economy and the local privatization and commodification of space. In this attack from “above” and “below,” the urban landscape is threatened with dissolution of urban units (Schmid, 2012), where the social barriers reappear within the fragmented city (Augé, 1992: 13). In this regard the concepts of centrality, meaning a pure form and space of encounter as a synchronicity of the urban social environment and difference, encompassing a simultaneity of the different social and material elements that generate something new when meeting (Schmid, 2012) have been equally contested. The nature, role, and relevance of the physical public space could no longer be regarded as given, being increasingly parceled out and submitted to a corporate, individual logic.

3.3.5 THE EVOLVING NATURE OF MICRO-URBANISM IN THE EVERYDAY PUBLIC REALM

The contours of publicness in the post-civil society can be redrawn on the base of Everyday Urbanism (Lefebvre, 1991; Certeau, 1984) as “an approach to urbanism that finds its meanings in everyday life”, as a zone of potential transformation of publicness “by reclaiming alternative spaces on the inside of an economized public life” (Dehaene & De Cauter, 2008: 4). Micro-publics as a theoretical concept of local everyday places, reassembles different human experiences, actions, and expressions through territorial production and spontaneous place-making in reference to Lefebvre’s call for heterogeneity in cities as a collective „Right to the City” (Lefebvre, 1991).

The collective assignment of meaning to public realm as a fundamental dimension of its formation has been first introduced with the concept of Production of Space (Lefebvre, 1991) as a socio-spatial practice applied in everyday life. In this context the evolving character of public environment formed a new focal point for scientific consideration. Production of space in the cities urban fabric would henceforth mean „a multilayered and often contradictory social process, a specific locating of cultural practices, a dynamic of social relationships, which indicate the changeability of space” (Bachmann-Medick, 2006: 289).

Space as a social product exceeded the limits of physical space, formed by a collection and materialization of things in a specific locus, as well as mental space as a representation. Production of space could only be grasped as a triad of spatial practice, representations of space and representational space (Lefebvre, 1991:33). Spatial practices meant daily routines and activities, shaping the experience and understanding of human relations in space. Representations of space are abstract and imaginary inscriptions, associated with knowledge, distinctive signs and codes that create an intentional space formed by the planner or the engineer. Representational space embodies direct or hidden symbolism, it is the space that is creatively produced and reproduced to extend the meaning of space through imagination (Lefebvre, 1991:33).
3.3.6 APPROPRIATION AS EVERYDAY PRACTICES OF URBAN LIFE

According to De Certeau (1984) a space articulates itself through social practices of everyday life. De Certeau's definition of space distinguishes it from a stable notion of place since it „occurs as the effect produced by the operations that orient it, situate it, temporize it, and make it function in a polyvalent unity of conflictual programs or contractual proximities“ (1984: 117). Therefore it deserves an actor who practices the ‚place‘ into a ‚space‘. Spaces are temporally specific relations between social-material actors and thus can reverse or transform the fragmented and polarized fabric through day-to-day actions. Public space can be thus understood as socially produced and a shifting rather than a stable spatial category.

All emplacements are leaving traces in the urban fabric. They never completely disappear but get increasingly superimposed with the passage of time. The new material inscriptions that alter the location, inherit and reorganize the previously existent and together they form a new whole. This illustrates how natural, mental and physical space never quite becomes entirely one but rather „an ensemble of a whole“ (Lefebvre, 1991:164). Places are ‚Palimpsests‘ that layer by layer transfer and move from one time to another.

The concept of ‚appropriation‘ is opposed to property and is best understood in relation to the opposite term ‚domination‘ (Lefebvre, 1991:165). While dominance is a space of political power, being transformed and mediated by technology and practice, such as a highway that cuts through a landscape or an airport where every corner is under technical control. Domination has always existed in history and found its spatial expression in the physical structures of enclosed, sterilized and emptied out architecture. ‚Appropriated space‘ however can be described as a modification of public, or at least not explicitly owned, space to meet the needs and opportunities for a group. Lefebvre argues that only a critical study of ‚space‘ can give a definition of what is ‚appropriation‘ (Lefebvre, 1991:165). Appropriated space can be a monument, a building, but also a plot, a square or a parking garage. Lefebvre argues that there is an abundance of appropriated places but there are difficulties in defining at what point, how, by whom and for whom they have been appropriated (Lefebvre, 1991:165).

These temporary or more persistent ‚territorial productions‘ (Kärrholm, 2007) can co-exist as long as they are subdivided in space or time. Persistent structural or social emplacements can be challenged by resistance and replaced, since the power-relations in space as well are relational: „Dominated space and appropriated space may in principle be combined – and, ideally at least, they ought to be combined“ (Lefebvre, 1991:166).

3.3.7 OTHER PLACES AS A REALM OF OPPORTUNITIES

When looking into the potential of local everyday production beyond its prominent venues, theoretical considerations of the concept ‚Non-Places‘ (Augé, 1992) provides a fertile ground of conditions to disclose the opportunities of the contemporary transformation of the city. Non-Places in the urban network in contrast to places, as relational, historical and concerned with identity, are defined by a lack of relationships on site (Augé, 1992). They are spaces of flows or transition, of arrival or leaving, of technical domination and structural concretization, laying the
infrastructural foundation for the post-civil network society. The contrary to a non-place is an anthropological space, which has inscriptions of social bonds or collective history. These inscriptions are less in the ephemeral and transient places, which lack sociality and symbolism (Augé, 1995: 7). Non-places are not integrated with other earlier places, being superimposed and assigned to a specific position (Augé, 1995:63). But, the notion of both place and non-place is in spite never existing in pure form, they are melting into each other. They are both present in the form of a palimpsest, where the ever changing identity and relations are constantly rewritten (Augé, 1995:64).

These transitional places can be regarded as potentialities of the ordinary, being overlooked and intermediary. Hence, they can still provoke new relationships and alternative territorial productions (Kärrholm, 2007). In the study of social spatial organization, territoriality described as concept, when human activities for practical reasons have to ‘take place’ to be able to access, influence and relate to urban environment (Kärrholm, 2007).

Foucault (1986) conceptualizes the social space of everyday life as a binary concept of a physical reality and mythical surplus, when the significance of a place to a social group can be symbolically charged. Appropriation, penetration and articulation of urban space can loosen socially programmed correspondences between function and place and eventually transform the meaning and perception of a spatial representation in the ‘lived space’ (Lefebvre, 1991). Heterotopia as ‘counter emplacements’ inject alterity into the sameness, the commonplace and the topicality of everyday (Dehaene & De Cauter, 2008). They are actual realizations of utopia, spaces of illusion and compensation made concrete (Foucault, 1986). They are ‘places of otherness’ because they put themselves to a certain extent against the ordinary spaces.

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**The literature review on public space transformation has shown the main threats of ongoing urbanization and restructuring of cities by a global free-market economy. Local privatization and commodification of space and a growing competition of cities on a global level have transformed the city’s urban structure and consequentially public spaces. Therefore the development and improvement of public spaces has been set on urban planning agendas in regard to a sustainable urban development. In order to discuss the research question how a mixed used parking garage contributes to a sustainable urban development in Malmö the following chapter is illustrating the strategies and the vision of the city.**
As mentioned in the introduction, Malmö is changing the paradigm of city planning and design of physical environment through a conscious construction of a new city image, developing from an industrial city to a sustainable city of knowledge.

Regarding the overall objective of Malmö to become a “mixed-use, dense and green city that is adjusted to walking, bicycle and public transportation” (Malmö, Stadbyggnadskontoret [2], 2010:46), four overarching goals are stated, according to which specific strategies and policies in urban planning, regulation and governmental control need to be aligned:

- Development of public transport nodes and zones
- Creation of highly mixed-use areas in the city
- Traffic reduction through transformation of traffic routes into shared space streets
- Development of public spaces with particular focus on green and blue qualities (Malmö, 2010)

Visions and strategies about the development of public spaces in Malmö are given in the Comprehensive Plan for 2012. Goals for the plan are the creation of vibrant mixed-use areas in the inner city with public spaces for culture, meetings and experiences. The vision for Malmö’s development until 2032 is that the streets and squares in the city will have an intense urban life by simultaneously becoming both cleaner and quieter. This is to be achieved through reduction and rearrangement of traffic. The parks and public spaces of the city are to be planned for multi-functional use to effectively maximize land use. Malmö should become a democratic and cultural arena with attractive meeting places that will encourage movement across boundaries.

4.1 URBAN RENEWAL AND DENSIFICATION STRATEGY

To accommodate a large part of Malmö’s expansion inside the outer ring means to increasing the volume of built infrastructure in the inner city through extensive urban densification. It is assumed that through higher exploitation of the city’s fabric, Malmö can continue growing with at least 100,000 more inhabitants, which comprises approximately one-third of today's population. To build the city denser is, on one hand an avoidance strategy of expansion in agriculturally and environmentally important zones beyond the city limits, and on the other hand a robust strategy that will handle continued strong population influx to ensure Malmö city’s development through economic investment, innovation and knowledge development (Malmö, 2013).

A space-efficient land use means that the existing urban fabric will be complemented through inward oriented growth, concentration of present transition areas, expansion of the public transport routes and, along these, a strategic allocation of additional functions that are lacking or underrepresented, such as residential, commercial, public services, as well as leisure and cultural
activities (Malmö, Stadbyggnadskontoret [2], 2010: 12). In the mixed-use environment variation in housing types, sizes and tenures is to be sought. Physical and mental barriers are to be removed to produce a far-reaching, consistent and joint urban structure. Movement patterns are to be simplified and new target points, evenly distributed across the city. Altogether it will contribute to new patterns of movement (Malmö, 2010) where meetings will take place in different scales, in the local community and in the central commons: „The inner city area will expand and Malmö will get more of a big city character with higher density, more movement and intensified city life“ (Malmö, Stadbyggnadskontoret [2], 2010: 47).

4.2 GREEN AND BLUE INFRASTRUCTURE IN THE CITY

The Green Plan for Malmö (2003) has identified the need for new green spaces within the cities network to sustain and build up an interacting and vital network of interdependent ecosystems. A part of the development plans for green structures is the target to strengthen Malmö’s brand “The City of the Parks”. This is going to be done through a high quality development of existing and new parks and squares, including cemeteries, plantation areas and other recreational areas. Nevertheless due to lack of land, the intention is to include additional structures to complement the network through adaptation and conversion of urban and rural interspaces, such as courtyards, playgrounds, alleys, streets and roofs (Malmö, Grönplan, 2003: 64).

Already now, Malmö has the lowest share of green areas among the 10 biggest cities in Sweden (Malmö, Statistika Centralbyrå, 2010). During the processes of urban densification, the green areas will be under bigger pressure. There will certainly be a need for new solutions concerning green areas and networks (Malmö, Stadbyggnadskontoret [2], 2010) that will sustain a certain level of ecosystem services in the local neighborhoods.

4.3 GREEN AREA FACTOR

The city of Malmö is applying a management instrument called Green Area Factor with the objective to attract private investments in the city’s green structures. The Green Area Factor is a proactive or retrofitting instrument promoting the development of biotopes within residential, commercial and infrastructural units (Malmö, GRaBS Expert Paper, 2009).

The system implied that developers should compensate the built area by integrating green surfaces on the actual site. It sets a standard of ecological minimum for structural changes by assigning factors to different surface types.

Potential improvements can be investments in green roofs, green walls, surfaces permeable to water, green surfaces and rainwater infiltration. Greening of roofs is an interesting solution for developers constructing in a dense city where access to open spaces might be limited. The Green Space Factor could be an efficient tool in achieving improvements of green services within densely populated areas.
4.4. TRAFFIC STRATEGY AND PARKING NORM

The municipality and the city planning office have an overall responsibility to design a "balanced and reasonable parking policy" (Malmö, Parkeringspolicy och Parkeringsnorm, 2010) and parking plan for the municipality. The municipality has the obligation to arrange parking, while the implementation rests with the responsibility of the property owner. The first parking norm was launched in 1960 as a result of a rapid motorization and urgent need for management and monitoring of parking space in the comparable dense inner city context (Tyrstrup, 2014).

A compact city form, supported by an adapted parking policy and traffic strategy should limit the climate influencing transports through an effective overall accessibility (Malmö, Stadsbyggnadskontoret [1], 2010: 47). The Parking Norm as a management instrument of Malmö's Planning Office calculates a minimum demand of parking spaces and serves as guidance for development plans and as a demand during building permission (Malmö, Stadsbyggnadskontoret [1], 2010: 33). The overall goal is to achieve a minimum ground parking and to maximize the ground efficiency in parking garages.

Paved surfaces such as parking spaces and traffic infrastructure often remain temporarily or partially unused (Malmö, Stadbyggnadskontoret [2], 2010: 18). In this context the municipality considers possible additional uses on a temporary basis to use the area that today is entirely reserved to the cars in a multifunctional, alternating way (Malmö, Stadbyggnadskontoret [2]: 18). Possible additional uses discussed in the Densification Strategy of the Traffic Environment are playgrounds, space for sport activities, workout facilities. Functional enhancements would give life to spaces that were previously characterized by motor traffic (Malmö, Stadbyggnadskontoret [2], 2010: 18). An interview with traffic planner Kenneth Fryklander showed that the municipality is aware of the use of additional functions in the ground floor. The motivation is here to create a vital street life and more life between the buildings (Fryklander, 2014).

Malmö's traffic strategy further includes large investments in cycle paths and public transportation. The city is known as Sweden’s best city for cycling with a cycle path network of 420 kilometers which is currently expanding (Malmö SMILE, 2009). Further, by using radar sensors, the city tries to prioritize cyclist. Additional facilities such as air pump stations and bike parking garages at train stations shall improve the traffic environment for cyclist even further (Malmö, Cykelprogram, 2012). The public transportation system is continually expanding with additional bus lanes, higher frequency of buses and large infrastructure project such as the Malmö city tunnel and a possible reconstruction of tram lines. All in all the city tries to provide attractive alternatives to the car and promote cycling and the use of public transportation. For instance the campaign no ridiculous car journeys aims to encourage people to rethink how they use their car for short journeys inside the city (Malmö SMILE, 2009).

All the interventions presented, as well as related strategies give reason to believe, that the number of car ownership and individual motor traffic will decline steadily, proved by a decreasing share of car traffic and motorization on the modal split of the city. Consequentially the parking garage and its profane functional service are questionable structures.
In this chapter parking garages as the object of study are presented. The focus here lies on parking garages with open roof as potential spaces for urban green and public space. The chapter starts with a general description of the parking garages in Malmö followed by an introduction to the biggest parking space provider in the city P-Malmö. Finally this chapter illustrates the case study of Lugnet and its parking garage P-Huset Anna. Lugnet has been chosen as a good example to trace back several stages of development of local neighborhoods, residential areas, green space pressures and public spaces beyond the historical part of Malmö. In particular the physical transformation throughout the process of Malmö’s urbanization predestinated Lugnet and P-Huset Anna as the case study for this thesis.

In order to analyze and discuss a possible conversion of a parking garage roof in public space the surroundings, social relations, historical events, the existing public spaces and perceptions of residents and visitor have to be included in the empirical work. Further the existing green structures and possible pressures have to be described to develop and elaborate the idea of greening a parking garage.

5.1 PARKING GARAGES IN MALMÖ

This study is focussing on multi-storey parking garages with open roofs in close proximity to residential areas. Thus underground garages, as well as integrated parking garages in the building structure and offside located garages in the suburbs are excluded from the study. Malmö has a total amount of 13 standalone multi-storey car parks in the inner city. Standalone means here that the garage is a structure in itself and not integrated into a bigger complex. The table below provides additional information about the parking garages.

The table (see next page) shows two periods of constructing parking garages. The first one in the 1970’s and the second one in the past 5 years from 2009 till 2014. By analyzing tourist maps from the past six decades the development and availability of parking spaces in Malmö gets visible. The majority of parking garages have one shop or office on street level. In all cases apart from the parking garage Petri the shops are just facing one side of the parking...
garage. Five out of 13 parking garages have no shops on the ground floor and are purely mono-functional. Additional functions on the top floor are not found in any of the parking garages. The analysis and connection to the cultural historical development described by Hasse (2007) and strategies and visions of the city of Malmö are following in chapter 7.

TABLE 5.2: MULTI-STOREY PARKING GARAGES IN MALMÖ WITH OPEN ROOF

<table>
<thead>
<tr>
<th>PARKING GARAGE NAME</th>
<th>OPERATOR</th>
<th>ADDITIONAL FUNCTION</th>
<th>LOCATION</th>
<th>YEAR OF CONSTRUCTION</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petri</td>
<td>P-Malmö</td>
<td>Shops on street level</td>
<td>Gamla Staden</td>
<td>1960's</td>
<td>Petri</td>
</tr>
<tr>
<td>Öresundhuset</td>
<td>QPark</td>
<td>Monofunctional</td>
<td>Hamnen</td>
<td>1973</td>
<td>Öresundhuset</td>
</tr>
<tr>
<td>Lidl Dalaplan</td>
<td>Apcoa</td>
<td>Shop on street level</td>
<td>Södervärn</td>
<td>1970's</td>
<td>Lidl Dalaplan</td>
</tr>
<tr>
<td>Smedjegatan</td>
<td>QPark</td>
<td>Monofunctional</td>
<td>Möllevangen</td>
<td>1970's</td>
<td>Smedjegatan</td>
</tr>
<tr>
<td>Trollhättan</td>
<td>P-Malmö</td>
<td>Monofunctional</td>
<td>Universitetsholmen</td>
<td>1970's</td>
<td>Trollhättan</td>
</tr>
<tr>
<td>Monbijou</td>
<td>P-Malmö</td>
<td>Shop on street level</td>
<td>Möllevangen</td>
<td>1970's</td>
<td>Monbijou</td>
</tr>
<tr>
<td>Södervarn</td>
<td>P-Malmö</td>
<td>Monofunctional</td>
<td>Södervårn</td>
<td>1970's</td>
<td>Södervarn</td>
</tr>
<tr>
<td>Anna</td>
<td>P-Malmö</td>
<td>Car Service</td>
<td>Lugnet</td>
<td>1978</td>
<td>Anna</td>
</tr>
<tr>
<td>Erika</td>
<td>QPark</td>
<td>Shop on street level</td>
<td>Västra Hamnen</td>
<td>2009</td>
<td>Erika</td>
</tr>
<tr>
<td>Dockan</td>
<td>P-Malmö</td>
<td>Monofunctional</td>
<td>Västra Hamnen</td>
<td>2009</td>
<td>Dockan</td>
</tr>
<tr>
<td>Centralstation</td>
<td>QPark</td>
<td>Office on street level</td>
<td>Universitetsholmen</td>
<td>2010</td>
<td>Centralstation</td>
</tr>
<tr>
<td>Fullriggaren</td>
<td>P-Malmö</td>
<td>Shop on street level</td>
<td>Västra Hamnen</td>
<td>2012</td>
<td>Fullriggaren</td>
</tr>
<tr>
<td>Godsmagasinet</td>
<td>P-Malmö</td>
<td>Shop on street level</td>
<td>Universitetsholmen</td>
<td>2013</td>
<td>Godsmagasinet</td>
</tr>
</tbody>
</table>

1 The information was gathered on the websites of P-Malmö. QPark, MalmöStad and during the interview with Christian Dahling (P-Malmö)
5.2 SERVICE AND PARKING SPACE PROVIDER P-MALMÖ

P-Malmö is the biggest provider of parking spaces in Malmö and owns and manages several parking lots with 35,000 parking spaces throughout the whole city. The company was founded in 1976, in the planning stage of the parking house Anna and is entirely owned by the municipality (P-Malmö, 2014; Dahling, 2014). Since then P-Malmö has built nine parking garages and sold one of them to a private company.

According to the company’s annual report from 2013 the demand for parking space and number of visitors arriving by car in central Malmö has decreased (P-Malmö, 2013). Improvements of alternative modes of transportation and a large number of road and bridge renovation work has lead to low occupation of parking garages. In particular the Malmö city tunnel and newly launched Superbusses have led to a large decline in demand for parking in some garages. Further the inner city parking garages in close proximity to retail business are facing an increasing competition of larger shopping centre outside the city centre. This affects particularly the inner city parking garages Petri, Anna and Södernvavn and leads to uncertainty about their further economic performance. The annual report from P-Malmö shows that the earnings for 2013 did not reach the amount that was budgeted and the company’s surplus was generated through the sale of real estates (P-Malmö, 2013).

According to Christian Dahling, sales manager at P-Malmö, the company has considered the implementation of additional functions and businesses in their parking garages, for instance car wash facilities or offices in the ground floor. Additional functions on the top floor have not yet been included in any of the parking garages but P-Malmö is interested in the allocation of additional functions (Dahling, 2014).

5.3 PARKING GARAGE P-HUSET ANNA IN LUGNET

P-Huset Anna is a 13 floor standalone parking garage in the district of Lugnet (P-Huset Anna, 2014). It was built in 1978 as a part of modernization and redevelopment processes in the district. These processes are further described in the following chapter and play a significant role for the analysis of the area and the parking garage.

P-Huset Anna was one of the last constructed parking garages of the first wave of parking garages in Malmö (Dahling, 2014). The parking garage has room for 680 cars and profits from its good location next to the city center, various commercial activities and the residential area of Lugnet. P-Huset Anna is known and popular for its graffiti wall on two sides of the garage. This has been confirmed with great consistency during randomized interviews in the district. The graffiti wall is the first legal graffiti wall in Sweden and is existing since 1979 (Grahn, 2013). The interviews with random respondents in Lugnet have shown that 4 out of 20 were using the parking garage sometimes. The main clientele of the parking garages are visitors for commercial and business activities in the area. P-Huset was also affected by new shopping malls and better car access in the suburbs from Malmö. Further the parking garage is located next to one of Malmö’s most frequented bike lanes and in close distance to newly merged Superbusses.
Centrally located, Lugnet has been the first expansion of the city on the opposite bank of the northward situated historical center of Malmö. In the late 1830s, the land has been bought by Kockums, parceled out and subsequently sold again to newly arriving workforce for the Kockum factories (HSB, 2014). Lugnet became the first working class neighborhood in Malmö. For many decades the city grew at a rapid pace. Already in 1913, although Lugnet’s boundaries remained unchanged to this date, the official figure of population indicated 5,363 inhabitants, which was more than a doubling of 2,008 inhabitants in 1865 and almost a doubling of the most recent statistical account from 2008, indicating 2,969 residents (Malmö, Områdesfakta Lugnet, 2008). Malmö’s total population had meanwhile increased more than fourfold from 21,198 inhabitants in 1865, to 95,821 officially accounted inhabitants in 1913 (HSB, 2014).

The district was, on the one hand, perceived as calm and idyllic, on the other hand it was bustling and alive, with a lot of small businesses, local services and crowded street corners (HSB, 2014; Sydsvenskan, 2009; Tyrstrup, 2014). With its flowering pear trees, lush backyards (Sydsvenskan, 2009) and a charming street pattern (Tyrstrup, 2014) the district could not escape the reputation of cramped and dirty buildings, dark streets, poor hygiene and poverty (Sydsvenskan, 2009).

As a multifunctional district in the city, Lugnet was to some extent left to itself until the 1970s. It was not so densely developed in the sense of multi-floor housing. The working class neighborhood had been retained for a sustained period, although debates about the small house settlement have been on the political agenda since the early 1960’s. In the year 1968 the decision about the demolition and renewal of the entire small house settlement had been made. Later on, in the year 1979 the last house that recalled the traditional look of the district was torn down.

The adjacent central areas were far more developed during the early stages of the 20th century, structures that have been preserved to this day, for example in the nearby Kungsgatan (Tyrstrup, 2014). A substantial traffic network including parking (Malmö Stadsbyggnadskontoret, 2002) was under ongoing expansion to facilitate access to the city center. The large increase in demand for parking space, was a result of fragmentation and functional division of the cities urban fabric (Malmö Stadsbyggnadskontoret, 2002). During the 1960’s and 1970’s a new modern planning policy of structural division intended, that office functions should be condensed in the city center, while big scale, modern residential areas were supposed to provide housing in the city’s outskirts. For this reason, central neighborhoods, especially old or underdeveloped buildings were torn down.
down or converted into offices and commercial buildings (Malmö Stadsbyggnadskontor, 2002). The southward expansion of the city was marked by allocation and development of strictly residential areas with communication to the center (Tyrstrup, 2014).

At the time of the extensive modernization of Malmö in the 1970s, it became very profitable to invest into central parts of Malmö. In this way, Lugnet could become a convenient location, profiting from the rest of the central part (Tyrstrup, 2014). Lugnet’s redevelopment as a mono-functional residential area was unusual and is explained as a reaction to the shortage of housing in the city center due to ongoing restructuring. Approximately at the same time, Caroli City as a commercial and residential complex in the old town has been developed through demolition of medieval settlement structures (Tyrstrup, 2014). Both developments, that of Lugnet and Caroli, are widely regarded as major mistakes in the planning history of Malmö. Being non comprehensive urban developments, they broke down the historical pattern of the neighborhoods (Tyrstrup, 2014).

A new era began with the crisis of the building industries when industrial city of Malmö became exposed to major employment problems. The decline in population and industrial stagnation meant quantitatively moderate expansions in the 1980’s. Preserving plans and a changing attitude towards historical buildings returned on the urban planning agenda (Malmö Stadsbyggnadskontoret, 2002). Since then, many of the historical places in Malmö, especially parks and market places were part of development plans and a city wide restructuring as ‘knowledge city’ (Tyrstrup, 2014). Both residential areas, Lugnet and Caroli, exclusively benefit from their central location, but fail themselves to become places of encounter and public life.

5.5 PUBLIC AND GREEN SPACES IN LUGNET AND SURROUNDING

As mentioned above, the original pattern of the district has been radically changed during the 1970’s due to demolition of a large part of the existing infrastructure, including small house settlements, other surrounding buildings, green structures such as fruit trees and gardens, as well as a substantial part of the street pattern (HSB, 2014). The renewal of the infrastructure was accompanied by a social change, since only few residents could afford staying in the neighborhood (Tyrstrup, 2014).

The new residential neighborhood is organized in several blocks, whilst tenancy is the most common form of tenure and one quarter of the residential units are condominiums (Bergvall, 2005). Accessibility of green structures in the district is mainly restricted to the tenants, being inwardly situated in courtyards or fenced gardens. Furthermore some of the initially open yards in condominiums have been fenced due to concerns of the tenants about safety, and vandalism in Lugnet (Bergvall, 2005).

Lately, the only public green area in the district Lugnagatan has been greatly reduced due to start of the approved construction process of a preschool on the site of the small park (Malmö Dp 5103, 2011). It is further noted that Lugnet apart from the port area has the largest proportion of impermeable surfaces, given here with more than 60%, as well as a highly fragmented green infrastructure where habitat change is strongly recommended to sustain coherent stocks for
ecological systems (Malmö, Dp 5103: 3). Nonetheless the local plan argues for a construction development on site, that will house a two floor preschool for 80 children with a small area adjacent the building that will house their more private courtyard. The area will furthermore include a partially greened and fenced dog park. No enclosure will delimit the preschool from the remaining park area, that should continue to be perceived as a public place (Malmö, Dp 5103: 6).

Kungsgatan is a greened boulevard street with several playgrounds, located between Värnhem and Lugnet. The major part of the popular promenade is relatively detached from Lugnet by the high traffic volume of the Amiralsgatan. Moreover there is a comparably wide road infrastructure in the side streets of Lugnet. Lugnet’s pedestrian alley, where plane trees and benches have been situated to promote linger, lately accommodates the ‘green path’ as the main detached bicycle traffic network between the popular districts Möllevangen, Sorgenfri, Davidshall, Mellersta Förstaden (Malmö, Cykelprogram, 2012). Furthermore it is a direct connection to the city center as main business and commercial area, as well as the university campuses, while the aforesaid districts are preferable living and meeting places. During traffic-intensive times the intersecting cycle paths with a designated roundabout cut the alley and the adjacent residential areas into two parts and increase the impression of a transit area.

6 BEST PRACTICE: KLUNKERKRANICH

The cultural roof-garden Klunkerkranich is a creative garden, event and bar project on the top floor of a parking garage in Berlin Neukölln. The parking garage is part of the Neukölln Arcaden, a large commercial center with shops, cinemas and a library. According to Klunkerkranich initiator Christian Kühner the size of the parking garage was from the very beginning overestimated in size, which resulted in empty parking room in particular on the top floor (Kühner, 2014). Already before the start of the Klunkerkranich, the top floor was known by the local community as a great place to linger and enjoy a panoramic view over Berlin. Henceforward the top floor was used for single events and parties as part of an urban trend of temporary use, occupation and exploration of vacant, offside or overlooked spaces.

Based on this, in 2013 two non-profit associations (Klangsucht, zuHaus e.V) and one event operator (Fuchs & Elster) formed the project of Klunkerkranich with the motivation to use the top floor more permanently. The parking garage management of the Neukölln Arcaden was cooperative, so that all parties agreed on a five year lease of the top floor to the Klunkerkranich association (Kühner, 2014). The parking garage operator saw the profit and promotion
opportunities offered by the project. However the set up of the culture roof garden was facing a variety of technical and administrative challenges, such as statics of the construction and fire regulations. According to Kühner the experience of the initiators in event management helped enormously in the project planning, implementation and in getting necessary permissions. The Klunkerkranich is a private-private partnership with the Arcaden management. Apart from the process of approving, the municipality did not facilitate the project development.

In 2014 the Klunkerkranich is starting into the second season. As an open air garden and event area it is closed during the winter and opens in April. The Klunkerkranich is spatially subdivided in an urban gardening area and an event/bar area. The visit of the urban garden is open to public and includes a small greenhouse, a beehive and a wide herb variety including medical herbs, but also decorative plants and only few berries and crops, since the concept does not cover the idea of self-sufficiency and urban farming. In cooperation with local school the roof garden has been offering project days when children could learn about different plant species and gardening. Further the garden includes birdhouses, nesting and breeding sites to protect bird species. Consequently the German nature conservation association (NABU) supports the project in monitoring the new habitat.

The bar area of Klunkerkranich requires a small entrance fee. This led to accusations of commercialization and privatization. However, Kühner (2014) justifies the entrance fee as inevitable in order to sustain the culture garden and finance the investments and lease, since the
project is not subsidized by any external funding. Various events with live music, readings and dance are offering a diverse program on the roof. Kühner (2014) states that the Klunkerkranich is a revaluation and enrichment for the area. Further Kühner (2014) describes that the Klunkerkranich tries to attract a diverse clientele from the area. In the first season the neighborhood was invited with individual invitation in every mailbox including a voucher for the bar.

The motivation of the project is not profit oriented. The sixty-person collective is built on a mutual consensus to use and shape city space in alternative ways (Kühner, 2014). The motivation of the team is the main driving force and consequently reason for success of the project until today. According to Kühner numerous hours of voluntary work fed by a common ideology can not be legitimized by any rational cost accounting and thus can not be planned and equally implemented in other contexts. In contrary, the project withdraws and exceeds the limits of a physically planned public space, by creating an island of imagination and to some extent realizing an utopia on the rooftop of a concrete structure, that in its actual design, function and substance is contradictory and opposed to the appropriated space by the Klunkerkranich collective.
The following analysis is divided into seven parts and aims to connect the presented study object with the theoretical framework and analyze it in relation to the overall strategies of Malmö. First an analysis of the historical development of parking garages in Malmö is presented (7.1) followed by a GIS analysis of their location and relation to green structures in the city (7.2). Further a possible greening of the parking garage is analyzed. It is analyzed in connection to the city wide strategies and therefore it is applicable to all parking garages in Malmö (7.3). The analysis is also made in relation to the specific case study of P-Huset Anna in the district of Lugnet (7.4).

In order to convert the parking garage into an accessible public space, open it up for social interactions, cultivation of individual and collective experiences and the emergence of culture on the top floor, the analysis takes a step back and considers the wider context of public and social relations in the city. Hence, the historical transformation of public space in Malmö (7.5), as well as the qualities of the local environment in Lugnet (7.6) are relevant criteria for the subsequent valuation of the top floor as a potential space for public use (7.7).

7.1 ANALYSIS OF THE HISTORICAL DEVELOPMENT OF PARKING GARAGES IN MALMÖ

Significant for the situation in Malmö is the density and large number of parking garages. Within the inner city Malmö has 13 standalone parking garages with open rooftops and a minimum of four storeys. In comparison the city of Copenhagen has three standalone parking garages within the inner city, yet with a much larger population and agglomeration. Moreover Malmö provides several underground garages and further ground floor parking lots between buildings and as temporary solutions before the plots get further developed.

The cultural historical review, illustrated by Hasse (2007) is applicable to the structure and architecture of parking garages in Malmö. Analyzing tourist maps from the past six decades illustrates how rapidly the amount of parking spaces in Malmö has developed. The first map from 1949 is showing that already then there was a large number of parking lots in the inner city and further shows an increasing motorization and need for parking (Sydsvenska Dagbladet Snällposten, 1949). The next available tourist maps from 1956 and 1970 show a large increase of parking spaces in the inner city, however no differentiation of garages and open parking space (Sydsvenska Dagbladet Snällposten, 1956; Sydsvenska Dagbladet Snällposten, 1970). Malmö’s population increased significantly in the 1960’s and 1970’s and consequently the amount of cars (Trystrup, 2014). Parking became a necessary implicitness in inner cities and parking garages were an ideal and inevitable solution to densify and create additional parking space (Hasse, 2007). In this way, the municipality reacts to the increasing individual car traffic. First, the 1960 launched parking norm helped to organise and monitor parking room in Malmö. Second, P-Malmö, the city owned parking space provider and management company is founded was 1976. Both, the first Parking norm and the newly founded company P-Malmö are signs for an increasing and necessary traffic and parking management in Malmö. A tourist map from 1974 shows the first differentiation
of parking site and parking garage (Sydsvenska Dagbladet Snällposten, 1974). The 1970’s were the peak of a fundamental modernization and motorization of the city (Malmö, Stadsbyggnadskontoret, 2002). The car as a design parameter and main mean of transportation was dominating the city’s development and increasingly fragmenting and disconnecting the different functions in the city to mono-functional places (Trystrup, 2014). In particular the parking garages Öresundhuset, Smedjegatan, Södervarn and Lidl Dalaplan are the last existing, original buildings of today, from the architectural modernism of the 1960’s and 1970’s and a strong limitation to simplistic functional buildings. The results are brutal standalone ferro concrete structures without any additional functions or aesthetical claims.

P-Huset Anna is the last parking garage built in the 1970’s (Dahling, 2014). In the two following decades the amount of parking garages did not increase. As Hasse (2007) illustrates the 1980’s and 1990’s were characterized by renovations of the older structure and a rising ecological movement which indirectly affected the structure of parking garages. However this first wave of greening and beautifying parking garages is not applicable to today’s existing parking garage structure. Only one out of the 13 parking garages has implemented a green façade.

The reinvestment and construction of new parking garages has been going on during the last five years in the course of Malmö’s transformation to a post-industrial city. New urban development projects, in particular the Western Harbour and the area around the central station are the new locations for the most recent inner city parking garages (Dahling, 2014). The residency and visitation of these areas has to be attractive by providing parking space in close proximity in aesthetic and functional buildings. The most recent parking garages can be linked to Hasse’s (2007) described aestheticization process. Elaborative and progressive designs of the garages and the use of lighting show a new role and status of the building.

In order to reintegrate the residential function, enhance business activities and simultaneously densify the inner city parking garages are seen as a necessary traffic structure (Fryklander, 2014; Dahling, 2014). P-Malmö sees the availability of inner city parking spaces as crucial driver for retail and business activities. Fryklander (2014) states that parking garages are necessary service buildings in providing parking space for a neighborhood which is getting densified, subsequently inhabited by more people and it can be assumed that there is an increasing demand for parking space. Nevertheless, in many cases the multi functionality of the parking garages is not existing. Despite that one to two offices or shops are located in the ground floor and shall enhance a vital street life (Fryklander, 2014), the uses are limited to retail or offices and in all cases just on one side of the garage. The rest of the garage is mono-functional parking space up to the top floor. Additional functions on the top floor have not been implemented in the parking garages in Malmö (Dahling, 2014).
In order to illustrate a lack of green spaces and green surfaces in the city of Malmö and underline the potentials of greening the parking garage, the study includes an aerial picture interpretation and analysis with ArcGIS. The mapping of the green spaces and green surface areas is based on an orthophoto of Malmö and to large extent on site observations.

The green spaces in the GIS analysis are divided into green areas and green surface areas (see MAP 1, appendix). Green areas are unbuilt connected green areas without an influence of buildings within 50 meter and a minimum size of 5000 square meters (Koppen et al. 2013). Hence, green areas include large parks, such as Pildammsparken, Kungsparken, Scaniaparken, Rönneholmsparken and Rörsjöparken and the beach area Ribersborgstranden in Malmö. Green surface areas include smaller green spaces within the city borders which are covered with vegetation but which are also to some extent sealed and fragmented by paths, little squares, graves etc. Green surface areas are characterized by a green surface with vegetation (small parks, gardens, yards between buildings, green paths along roads, cemeteries) but do not have the same recreational quality and ecosystem services as a larger green spaces (Bolund et al. 1999; Mansfield, 2005).

Koppen et al. (2013) illustrate that the distance to green spaces should not exceed 500 meter. Based on this study and in order to show neighborhoods in Malmö which are lacking green spaces in walking distance MAP 2 (see appendix) illustrates green areas with a buffer of 500 meter and green surface areas with a buffer of 50 meter. The 50 meter buffer is chosen as an adequate walking distance for residents or employees in an area to reach their closest small green space for recreational use. Finally the GIS analysis illustrates a lack of green spaces in the city, in particular in close proximity to the parking garages. MAP 3 (see appendix) shows that various parking garages are situated within a gap between a large green space in the eastern part and three other green spaces in the western part.

Due to the height of the top floor, the panoramic view gives the visitor the feeling of being in a larger and open space. The look out makes the space bigger than its actual size and achieves the positive feeling of being “cut away” from the street life. Hence the roof, despite their limited size, offer an escape from the urban landscape and its busyness. This escape is also experienced with a different sound environment. Concerning these additional attributes of a roof garden the possible walking distance for a longer stay and linger in such a place is larger than to a smaller green surface area. MAP 4 (see appendix) shows the parking garages with a buffer of 300 meter. This walking distance seems to be acceptable to reach a place of recreation and feeling of being “cut away” from the street life. MAP 5 (see appendix) shows how the parking garages can compensate the large gap of recreational green spaces in the inner city.

The gap is affecting the city’s green infrastructure, not only in terms of recreational use. Sandström (2006) claims that a network of green spaces is needed to maintain the ecological values of an urban landscape. Landscape fragmentation is one of the key pressures on green structures and its ecosystem services (Saunders et al., 1991). Here the greening of parking garages could provide valuable local ecosystems to better connect the different habitats in the city.
The earlier illustrated development plan “The City of the Parks”, the management instrument Green Area Factor and the interview with city planner Kenneth Fryklander show that the municipality is aware and interested in the preservation and creation of new green spaces. However the existing structure has only been marginally included in the program. Facing the large gap of green spaces between the eastern and western part and an increasing densification and rising population number, thus even greater pressure on the green spaces, there is a need for new solutions of green areas and networks. Therefore, the strategic position of parking garages makes them interesting structures for possible green spaces and part of a green network.

7.3 GREENING OF PARKING GARAGES

A conversion and reconceptualization of the top floor of parking garages to a green roof, facade greening or accessible pocket park is one possible alternative and sustainable function for the free-standing spaces of the garage. On the one hand the greening of parking garages brings a variety of social benefits and ecosystem services, on the other hand the conversion to a green space is characterized by technical and administrative challenges (Kühner, 2014; Fryklander, 2014). The greening of parking garages is not only motivated by covering the bad image and reputation of the car which was found in many façade greening projects in the late 1980’s with the upcoming of environmental awareness and ecological movement (Hasse, 2007). Proved by various studies and already existing projects the greening has a significant positive effect on the urban environment (Bolund et al. 1999; Onishi, 2010; Getter and Rowe, 2006; Pérez et al., 2011; Kühner, 2014).

The modernist era invented the flat roof top and paved the way for a new, additional outdoor space on it. The main objectives of green roofs, their aesthetical and environmental benefits in the local neighborhood, are equally applicable to the top floor of a parking garage. Malmö is under the 10 biggest Swedish cities and at the same time one of the most densely populated city with the lowest share of green areas. Its development strategies and management instruments anticipate, that all spatial planning should be based on significant expansion of the natural and cultural environment, especially when it comes to newly built or paved areas (Malmö, Grönplan, 2003; Malmö, 2013). Since the green areas are predominantly concentrated in Malmö’s park spaces, the accessibility and provision of green is unequally distributed with the cities urban fabric. In densely populated urban areas the amount of green significantly decreases. Nevertheless, 71% of Malmö’s construction and development projects are built on or partially expanded into green areas (Malmö, Statistiska Centralbyrå, 2010).

The top floor of parking garages is exposed to enormous weathering processes, such as heavy rain, solar radiation, snow, ice and wind and mechanical load of moving cars (Kurz, 2004). In addition de-icing salt from tires corrodes the ferro concrete structure of the parking lot and consequently renovation and retrofitting is necessary to ensure the serviceability of the parking garage. A green surface of vegetation and soil could protect the parking garage from harsh weather and would increase its lifespan and decrease renovation costs in the long run (Carter and Keeler, 2008; Preiss, 2013). Green facades as well have an effect on sound insulation and noise absorption what is particularly interesting for a parking garages.
Malmö is facing an increase in extreme weather events such as heavy rains, storms and urban heat island in the summer (Malmö Stad, 2014). Therefore the city has launched various climate adaptation actions including open storm water management, the use of green façades and green roofs. The described management tool Green Area Factor is here a practicable instrument to promote redevelopment through investment in green surfaces but is not yet applied to the existing parking structures in the city.

Parking garages with their large concrete surfaces on roof and facades can lead to an increasing risk of urban heat island and rainwater run off. The walls and roof of parking garages are impervious surfaces, hence they can contribute to the formation of urban heat islands (Onishi, 2010). Green façades and green roofs can mitigate the heat island effect by cooling the air through evapotranspiration and by shading areas (Pérez et al., 2011; Getter and Rowe, 2006). An additional layer of soil and plants can effectively reduce stormwater runoff, store an amount of heavy precipitation, clean the water and emit the water as steam and finally cool the city. Also the interview with Malmö Stad’s city planning department confirmed that green structures on roofs are essential to deal with storm water and heavy precipitation in Malmö (Fryklander, 2014).

A roof garden and pocket park can have a significant effect in providing a habitat for birds and insects and consequently connect the city’s habitats. The example of the culture roof garden Klunkerkranich in Berlin shows that a roof vegetation can be a valuable habitat for bees and even protected bird species (Kühner, 2014). The habitat on the parking garage in Berlin is so valuable that even the federal nature conservation association (NABU) joined the project in monitoring and saving the habitat. An advantage for vegetation on the top floor of parking garages, observed in various parking lots in Malmö, is an intensive solar radiation. This is particularly interesting for urban gardening and farming, hence the inner city food production. The accessibility of the garage roof for cars and elevators is here an extra advantage in order to install and supply an urban farming system and provide easy transportation of the yield.

In addition to the environmentally sustainable effects of a green parking garage an accessible roof park on the parking garage could provide positive social and cultural services. As described in the theoretical part on urban green spaces a public roof garden could provide a common habitat and space for interaction beyond the private, shared by a number of local users and therefore encourages a feeling of community (Kazmierczak, 2013; Kim and Kaplan, 2004). This equates Malmö’s strategy in finding new patterns of movement where meetings take place in different scales, in the local community and in the central commons. Here the culture roof garden Klunkerkranich proves how an urban roof gardening is a meeting point for a various clientele and enhances social interaction in a different and new environment.

If combined with sports facilities for instance basketball court, football pitch, skate park or open air gym, a roof garden can promote physical activity and consequently has an effect on human health and well-being (Tzoulas et al., 2007). This additional function would again equate Malmö’s vision of a mixed-uses and a strategic allocation of additional functions.
The analysis of the area Lugnet and the parking garage Anna is based on randomly conducted interviews with residents and visitors of the area. In addition two interviews with the parking management company P-Malmö and former city planning architect Tyrstrup, historical maps, aerial picture interpretation and observations are included.

The interviews with residents and visitors showed that the area is appreciated because of its large amount of trees. In particular the cycle path and Kungsgatan boulevard are preferred by cyclists and pedestrians to move between the different districts in Malmö. Therefore the green spaces in the area along the cycle path have an effect on the mitigation of emission because they are combined and promote walking and cycling in the city (Strohbach, 2012). Observations along the cycle path, Kungsgatan and an aerial picture interpretation of Lugnet show a large number of trees in comparison to its surrounding.

However most of green structures are enclosed within private backyards and not accessible by public. This green space fragmentation threatens habitats and ecological diversity but also harms the conditions for pedestrian activities in diminishing the accessibility of public green spaces and discouraging its use. (Di Giulio, 2009; Saunders et al., 1991). More than 60% of the surfaces of Lugnet are sealed which increases the rainwater runoff and risk of urban heat islands. A lack and need of better green spaces to linger was mentioned by several interview partners. Due to a new pre-school building in the area a large part of a local park was transformed into building structures and a new fenced dog- area is taken more room from the park as a place to sit in the green space. In particular in cities where the demand for land is increasing and in regard to Malmö's overall strategies of diversification open green spaces are threatened to be subject of residential and commercial development projects (Tajima, 2003).

The ArcGIS-analysis shows that the neighborhood around P-Huset Anna is further away than the crucial 500m distance to a green space (see MAP 5, appendix) (Koppen et al., 2013). A possible roof garden could close this gap and provide an opportunity for residents of being “cut-away” from busy street life with a look out, high solar radiation, a different sound environment and a view on green spaces in close proximity. According to Ulrich (1984) even the passive viewing of green spaces enhances psychological health and well-being. The ecological value of a roof garden is questionable, but the best practice
example from Berlin shows how a roof garden can contribute to biodiversity in creating a habitat for insects and birds.

To some extent the facade of P-Huset Anna is already used for greening. However it is limited on one floor and just on two sides of the building. In order to enhance the above mentioned ecosystem services of a green facade the greening of the walls should be extended around the whole building and the entire facade. The already existing vertical facade structure brings ideal conditions for climbing plants (Preiss et al, 2013).

7.5 ANALYSIS OF THE TRANSFORMATION OF MALMÖ’S PUBLIC SPACES

In order to illustrate an ongoing commercialization and spatial concentration of public realm in central parts of the city of Malmö and underline the potentials of alternative and other space creation within them at sites that are hidden and overlooked in everyday routines, an aerial picture interpretation and analysis with ArcGIS has been conducted. The mapping of publicly owned, managed and privatized consumption areas are based on individual aerial picture interpretation and through on site observations.

The differentiation of public space has been made on the basis of two contrasting definitions, one describing public space as an open and accessible space of encounter, including parks, squares and other publicly owned and managed outdoor spaces (Sennett, 2010) and another discussing commercialized spaces as a new environment open to the public and promoting community vitality (Chung, 2001). The street network has been included in both categories insofar as it met the distinguishing feature of, open encounter’ or, commerce’.

Hence publicly owned, open spaces of encounter include all park areas, e.g. Pildammsparken, Kungsparken, Scaniaparken, Rönneholmsparken and Rörsjöparken, Varvsparken, Ankarparken, further public squares, e.g. Gustav Adolfs torget, Stortorget, Lilla Torg, Davidshallstorg, Drottningtorget, Möllevangstorget, St Knuts torg, the beach area Ribersborgstranden, developed sections of the waterfronts by the canal, as well as small scale local green islands open to public, the walking path on Kungsgatan, several cemeteries, skate parks, playgrounds and dog playgrounds. Railway stations and bus stops as spaces of transition with a lack of social relations on site have been excluded (Augé, 1995), as well as spaces for public services, such as libraries, hospitals, civic centers. They are excluded, since they lack interaction and are visited for individual purposes as well.

Consumption and semi-public spaces include all urban retail environments, e.g. pedestrian shopping zones, shopping malls, commercialized park areas, public squares dominated by cafe outdoor areas, as well as commercial streets in local areas.

MAP 6 (see appendix) shows the entire inner city area while MAP 7 (see appendix) focusses on the city center, which is the most densely built part of Malmö, with a significant lack of non-commercial, recreational public environment (Tyrstrup, 2014). The comparison illustrates the co-organization of both types of spaces in the city center, in particular the integration of public squares into commercial pedestrian zones.
Malmö’s development to a powerful industrial center during the first half of the 20th century and transition to a ‘knowledge city’ thereafter were equally marked by rapid growth and expansion of the city (Tyrstrup, 2014) at the expense of its multifunctional integration (Madanipour, 2005). In both cases the city centre has been given the role of a meeting and production venue, where office-space, as well as business and commercial activities should be concentrated. The modern restructuring was accompanied by a functional separation of urban units to assure more land use for trade and production. This is when strictly residential areas have been relocated in the outskirts of Malmö and infrastructurally connected to the center by expansion of the road network and allocation of parking garages in central parts of the city. With the new spatial order, increasing mobility and heterogeneity of the current city, new social rhythms and cycles were introduced in terms of everyday life experience, urban fractions, (dis)connections and passage spaces between the urban units (Kniess & Dell, 2009).

A rethinking and restructuring has been on the planning agenda since the middle of the 1990's when Malmö, hard hit by the oil crisis and financial crisis struggled with exodus and unemployment due to the shutdown of all major industries. At this time the city center reappeared in the development plans of the municipality as a multi-use district, touristic attractor and a place for social encounter and vibrant city life (Jacobs, 1961; Gehl, 1971). A comprehensive restructuring and promotion of Malmö in a global market as a ‘city of knowledge’ was addressed through a new interpretation and improvement of public spaces (Madanipour, 2005). The marketing of Malmö as an attractive destination for financial and entrepreneurial investment, knowledge production, lifestyle and tourism should encourage the reallocation of mobile resources, e.g. cooperates, creative classes, young and educated in Malmö. Hence, the municipality increasingly focused on stimulating economically productive activities by attracting private investments in the city center (Brenner & Theodore, 2002; Harvey, 2005).

Kärrholm (2006) argues that Malmö has been successful in establishing the centre as a shopping district and synchronizing commercial rhythms with important urban rhythms and mobilities of everyday life. The development of the old city core was marked by new mono-functional territories of shops (Kärrholm, 2006: 4). Hence public activities in the downtown of Malmö are to a large extent dominated spaces of systematized appropriation (Lefebvre, 1991), where territorialization and synchronization feed each other. MAP 7 (see appendix) shows, that traditional public spaces such as public squares, e.g. Gustav Adolfs torget, Stortorget, Lillatorget, Davidshallstorg have been framed and integrated into the pedestrian retail zones. In addition the pedestrianized areas of the old city core have been further expanded into adjacent areas, e.g. Davidshall, Triangeln by means of introduction of new walking paths with malls and shopping galleries, further connected by an ongoing infrastructural development of public transport, e.g. Triangeln train station, redistribution of the bus network and introduction of the bus lane, the ongoing debate about the return of the streetcar, as well as the extensive development of green biking paths as a new means of mobility within the city (Malmö Cykelprogram, 2012).

The mobile society is seen as highly dynamic, living in an ‘epoch of space’, simultaneity and juxtaposition (Foucault, 1986). Consequently places, local neighborhoods and the entire ‘concept of the city no longer correspond[s] to a social object’ (Lefebvre, 2003: 57), being increasingly weakened in favor of a heterogenous grid of flexible connections and intersections (Foucault, 1986).
1986; Augé, 1992). In many respects Malmö’s prevailing development can be seen as a progressive expansion of interconnections between local urban units, as well as on a global level as part of an interconnected world-pattern of spaces of circulation, consumption and communication (Augé, 1992).

Nonetheless the continuous global space of interconnections is an illusion, since the fractures and barriers reappear within the fragmented urban city (Augé, 1992). While parts of Malmö are stimulated by economic investment and city marketing, other districts remain overlooked and neglected. After the demolition in the 1970’s of Lugnet’s historical pattern as the first working class district and its redevelopment as a mono-functional, modern residential area, the neighborhood has drawn attention with its large proportion of impermeable surfaces, a decrease of functioning of the ecological networks through fragmentation of the green infrastructure (Malmö, Dp 5103, 2011), as well as social withdrawal into privatized and increasingly fenced backyards and gardens due to concerns of its tenants about safety and vandalism (Bergvall, 2005).

In the following chapter an analysis of Lugnet as transit area will be performed with the emphasis on everyday production of space by means of experience, perception and imagination of its users.

7.6 URBAN CONNECTIONS – LUGNET AS TRANSIT AREA

The main challenge of spatial transformation of cities and its urban units considers the maintenance and promotion of interconnections within them (Wlodarczyk, 2009). Spatially they are expressed by the arrangement of open space in the city, when crossroads are an important dimension of mediation on the urban macro-level, as well as its integration into the local micro-level of the neighborhood (Lefebvre, 1991). On the one hand footpaths and open areas of encounter can stimulate humanization of the city (Gehl & Gemzoe, 2000), on the other hand, the increasing mobility of city dwellers can counteract and degrade the liveliness of places, when domination by flows on site can lead to transient areas (Augé, 1995). This section will discuss the degradation by homogenization of space production within local urban units.

![Figure 7.3: Lugnet, cycling path, 2014, photograph: V. Hoffmann](image)
A comprehensive network of cycling paths has been constantly expanded in Malmö since the 1970’s (Malmö Cykelprogram, 2012). In the centrally located district Lugnet, whose transformation and modern restructuring of physical form since the 1970’s have caused a remarkable decrease in provision and withdrawal from actual use of the open space in the area (Tyrstrup, 2014; Bergvall, 2005), a retrospective integration of a main ‘green cycling path’ has been performed during the 1990’s (Tyrstrup, 2014; Cykelprogram, 2012). In order to analyze the quality of public space in Lugnet, its actual everyday uses, as well as individual and collective perceptions of the environment, 20 random interviews have been conducted on site. Further a walking interview with the former city planning architect, Olov Tyrstrup in the area framed the analysis with historical background information about the planning and development intentions for Lugnet during the 1970’s.

While some urban activities can be co-arranged, other territorial productions tend to be exclusive and spatially dominant, hence they can displace previous uses of the area (Kärrholm, 2010). Augé (1995) argues similarly, when introducing the concept of non-places as spaces of flows or transition, laying the city’s infrastructural foundation for the mobile network society. Non-places are superimposed and can not be merged to a texture with other spatial productions on site due to their technical domination and structural concretization (Augé, 1995:63).

Lugnet’s public environment has been greatly reduced to a road network during the 1970’s when the demolition of the working class neighborhood erased the historical traces of a mixed-use environment in favor of a strictly residential area. Observations of public activities on site, as well as interviews with users have shown, that Lugnet’s role in the city today is marginalized as transitional and passage area for cycling and pedestrian commuters between different districts in the city. From 20 interviews performed on site, 17 respondents did not live in Lugnet, of whom 12 lived in close proximity to the district and agreed on using the area exclusively as passage between their home and other parts of the city.

Observations of public activities in the neighborhood have underpinned a great dominance by physical activity, e.g. cycling, passing, rushing, walking, running or jogging in the pedestrian zone on Kaptensgatan. At all times of the observations performed, the side streets in Lugnet were mainly used by cars, rarely used by pedestrians and almost not used by cyclists. Thus they were perceived as
inanimate. In stark contrast, Kaptensgatan, which accommodates the busiest bicycle crossing, with 16,000 cyclist passing the intersection daily (Sydsvenskan, 2013) has been described by three interviewees as dominant, disturbing and dangerous.

The traffic in the Kaptensgatan is mainly performed individually, a few social interactions were noticed at the traffic junction between Kaptensgatan and the green promenade Kungsgatan. The majority of pedestrians interviewed on site have shown a disinterest in Lugnet's public space, 2 residents inclusively, who altogether agreed on not using the public services provided in the area. Although half of the respondents were in Lugnet on a daily basis, and further 7 interviewees passed by the district at least once a week, only 5 commuters and 1 resident could provide an answer on the demand of a favorite place in the district. While 2 interviewees favored the cafe located in the intersection of Kungsgatan and Kaptensgatan, 3 respondents mentioned the graffiti wall at the parking-garage P-Huset Anna.

The observations on site supported the result of the survey insofar as the cafe has been distinguished as well frequented. Often the mutual use of the cafe and the directly adjacent green and public environment, e.g. playground and promenade, was observed in the branching of the roads Kaptensgatan and Kungsgatan. Parents combined a visits to the playground with a coffee break, as well as dog owners passed by the cafe on their walk. Three of the respondents, who walked with their dogs, mentioned the intersection as a green, calm but vivid island in Lugnet.

The pedestrian biking zone on Kaptensgatan was observed as a constantly crowded area of transit. The bicycle traffic was systematized and structurally concretized by means of a designated area and adjusted infrastructure including street signs, a roundabout and and recently installed garbage cans for cyclists. A distinguishable separation of cyclists and pedestrians was thereby insured and reaffirmed by the complexity and dominance of the bicycle traffic.

Neighborhoods have been largely discussed as an endangered dimension of the city due to increasing mobility between and heterogeneity of urban units, when the commonality of an actual place would become increasingly marginalized and the former social bonds of residents in a common area would be weakened due to an increased flexibility and spread of activities in the city (Augé, 1995; Kniess & Dell, 2009).

A consequent criterion of use of the main walking path and biking lane, was the estimated average age of the pedestrians. While the main pedestrian and bike traffic was situated on Kaptensgatan, pedestrians encountered in the neighboring side streets of Lugnet were considerably older. Benches along Kaptensgatan, however, were rarely used. Generally, a constant flow through the district has been noticed, as neither cyclists, nor pedestrians tended to stop or linger in Lugnet. Many of the passerby took advantage of the route for communication purposes via phone, listened to music or looked at their phones.

Socially produced and spatially performed, public space always exceeds or falls below its actual physical entity (Certeau, 1984; Lefebvre, 2003). As an accumulation of everyday performances, of „murky intertwining daily behaviors on site“ (Certeau, 1984), the qualities of a specific public realm can only be grasped when including the mental concepts and perceptions of space into the reflection.
A contrary and noteworthy behavior was distinguished in the surroundings of the parking garage P-Huset Anna. Here, where the first legal graffiti wall is situated since 1979, many pedestrians have been observed to persist, hold in and actively review the constant change of graffiti on the ground level of the parking house. In many cases photographs have been taken. Two respondents described P-Huset Anna as a considerable place to meet, due to its outstanding recognizability. One respondent even described the parking garage as famous, when a great crowd would meet here to watch the fireworks on New Year’s night. Although only 4 interviewees used the P-Huset Anna to park their car in it, 17 respondents were familiar to the building, while 7 of them brought it primarily in connection with the graffiti wall. Although the majority of interviewees considered parking garages as needed in Malmö, 4 respondents suggested, without demand by the interviewers, that the space in P-Huset Anna could be used better or more effectively.

7.7 POETICS OF EMPTINESS AND DISTANCE ON THE TOP FLOOR OF P-HUSET ANNA

Because of their aesthetically present but inanimate structure, especially the mono-functional standalone parking garages tend to be perceived as superimposed within the local urban environment (Augé, 1995). Hence, parking garages are usually seen as disintegrated non-places, lacking inscriptions of social bonds. As service architecture they are a substantial part of macro-structural traffic network in the city, hence, on the local level they rather disrupt the urban texture (Augé, 1995). From the perspective of everyday life parking garages can be treated with
reservation being perceived as inanimate, massive, odd and rather boring places. The survey with passerby has shown, that P-Huset Anna was mostly treated with indifference, when questions dealt with specifically functional dimensions of the parking garage, e.g. the use and need of parking space in the district. 16 of the respondents did not use the service of the garage and 8 could not provide an answer, whether a parking garage was needed in the district.

P-Huset Anna in Lugnet, in contrast, is linked to everyday perceptions by communicating with the local surrounding through inscriptions and everyday appropriations of its exterior facade. Since the construction of the parking house in 1978 as the first project by P-Malmö, two walls have been provided for additional use as the first legal graffiti walls in Malmö (Dahling, 2014). Due to the permanent exchange and temporally specific relations between social-material actors on site, P-Huset Anna can be interpreted as an integral part of Lugnet’s public space, socially produced through day-to-day actions (Certeau, 1984). The shifting spatial category of P-Huset Anna injects alterity into the sameness of the transitional district of Lugnet (Dehaene & De Cauter, 2008).

Due to their profanity parking garages tend to be overlooked in everyday life (Hasse, 2007). P-Huset Anna becomes visible because of the inscriptions of desires and ideas of social actors which are projected onto the space. In that context, it is not the physically given, but also the imagined space (Foucault, 1986), which in everyday life assigns meaning to the structure of P-Huset Anna. These emplacements of illusion when a meaning of a place becomes expanded and enriched, Foucault (1986) describes as social practices of compensation through production of ‘Heterotopia’, as actual realizations and emplacement of utopia into the reality.

The parking garage as ‘non-place’ and the graffiti wall as ‘place’ are both territorial productions of everyday routines, which are spatially co-organized in the same physical environment. Non-places and places are concepts of spatial organization of society that never exist separately, they are mutually dependent (Augé, 1995). It is the structure of the parking-garage that by its non-animated physical structure of enclosed and emptied out service architecture entails space for modification.

Disconnections in urban texture are physically marked by barriers, such as walls, fences or closures. Similar effect can be produced by gaps, emptiness and absence of a connection. An empty space can be regarded as a symbol of different forms of absence, e.g. the absence of material things, the absence of social relations, the absence of central urban functions or the absence of regulation and order. Emptiness can be further enforced by non physical barriers, when regulations, rules or socially encoded cultural meanings obstruct the access and visibility of places (Lefebvre, 1991).

Parking garages in Malmö are overlooked nodes, that have been constructed for the purpose of a modern comfort, and steadily become less used in the central parts of Malmö due to expansion of the city by means of new urban centers and ongoing investment in public transport (Dahling, 2014). Particularly affected are parking garage top floors, since they do not provide the same comfort as the covered areas of a parking garage. In the interview with the sales-manager of P-Malmö Christian Dahling (2014) the reasons for a lack of demand for parking on the top floor were stated to be the exposure to weather and the overall decrease in need for parking spaces in central Malmö. That is why P-Malmö is providing commercial localities in the street levels and
looking for opportunities for mixing the use within the existing parking house structures in Malmö (Dahling, 2014; Tyrstrup, 2014).

Empty space offers the possibility to be filled (Lefebvre, 1991). In the case of Lugnet the parking garage top floor has the capacity to hold what is lacking or what is wished for, since it offers unoccupied, socially abandoned space in a disconnected zone. Different human experiences, actions, and expressions can here find room to take place.

The best practice project Klunkerkranich shows, that an empty place can be filled with new meaning and that public encounter can happen in the secluded niches of the urban fabric. It has also shown, that appropriation can create publicness by means of territorialization of a space to meet the needs of a social group. Nonetheless, the transformation of a place needs to be constantly updated, since it is the everyday practices that actualize the collective perception of publicness.

In contrast to the local environment in Lugnet which is dominated by a systematized infrastructure occupying the public space and limiting it to one function, as a transit zone for cyclists and pedestrians, the parking house roof top is a structurally outstanding island with its opposing characteristics to a transit area.

The entrance of P-Huset Anna is marked by a complexity of permeable barriers, e.g. regulations, signs, passages. The threshold is furthermore experienced by the standstill on the inside of the parking garage in contrast to the constant flow of traffic throughout Lugnet. Its full effect is achieved on the top floor of P-Huset Anna, where a panoramic view over the city and lack of occupation by cars stimulate an experience of ‘otherness’ (Foucault, 1986). The space that opens up on a parking garage top floor is a ‘counter-space’ (Foucault, 1986) to all emplacements in the city. Looking down on the familiar everyday environment, reveals the spectacle of the urban network of collective movements (Certeau, 1989). The feeling of finding yourself in a distance to the urban network, of being “cut-away” in an abandoned empty space, in distance to the city, nonetheless centrally located and linked to the urban fabric by porous boundaries, has been described by Certeau as an experience of being “lifted out of the city’s grasp” (1989: 93).

An ArcGIS analysis of the viewshed from P-Huset Anna (MAP 8) has been contrasted with a viewshed of two public green spaces on the ground level in close proximity (MAP 9). While the view from Kungs.gatan and the greened area on the canal bank has been highly limited by the surrounding environment, e.g. buildings and trees, to a radius of approximately 100 meter, supplemented by a few sightlines, the viewshed from the 13th floor of P-Huset Anna extends the limits of the district and offers a look-out over the city’s roofs.
The analysis has shown that large investment in public transportation and bicycle systems lead to a decrease in car use and consequently a decline of demand for parking space. This results in empty spaces in a good location in the inner city which could be used differentially. Examples of parking garages in Malmö have shown that the allocation of ground floor shops and offices in parking garages has already been applied.

However when it comes to Malmö’s overarching goals, parking garages are still overlooked nodes, and the upholding and further construction of them is not sufficiently reflected in the context of traffic reduction, development of mixed-use areas and public spaces with particular focus on green spaces and its ecosystem services. An inward oriented urban growth with concentration on present transition areas needs to include parking garages in the overall strategy of urban densification and allocation of additional functions. This study concludes that parking garages are overlooked nodes with further potentials for adaptive reuse.

An increasing urban population and higher residential density leads to a larger demand for public and green spaces and subsequently to a need of alternative uses of the existing urban structures. In particular the case study of Lugnet has shown that the sustainable planning strategies are not applied to the area and its parking garage P-Huset Anna. Mono-functional, standalone parking garages are not compatible with strategies of mixed-use and compact city. Additional multiple functions and uses need to be integrated in the existing structure of parking garages.

The study of possible integration of public and green services into the existing structures of parking garages has been performed on the level of a city wide analysis, as well as in a particular context of a central district in Malmö. Both analyses have shown that the location of parking garages within network nodes of an increasingly mobile society and fragmented city structure could be strategically smart locations for additional uses. Furthermore an evaluation of parking garage usage has confirmed, that stand-alone, open-roof structures have been affected by vacancy, specifically in the upper floors due to decrease of demand for car parking in the central parts of Malmö. In the interviews with the parking space provider P-Malmö and the City Planning Office a possible integration of additional uses on the top floors has been met with interest. The sustainable city strategies by the municipality have shown an awareness and interest in new, alternative green structures but they have not yet been employed to the existing structures of parking garages.

Especially in inner city districts the location of parking garages has been identified as beneficial to close the gap of public green space provision in highly built environments. Public green spaces in cities have been affected by degradation throughout the urbanization process, and have only recently been identified as prerequisites for community vitality, ecosystem services, social and cultural advantages, as well as conservation and protection of habitat patches. Consequently, revaluation of green and public environments has been identified in particular for attractive city districts or new urban development projects.
Because of the disconnection of urban functions, an increase in mobility and flexibility of dwellers has produced a network of overlooked transit zones and areas between the actual destinations. The survey in the district of Lugnet supported the hypothesis that the public environment of the residential area has been used and perceived as passage space in the city. Hence, the parking garage P-Huset Anna in Lugnet has been identified as an outstanding space of opportunity to compensate the lack of green and public environment in the area.

It has been shown that the greening of a parking garage through allocation of ecosystem services, apart from possible technical and economic challenges, is likely to provide a variety of advantages as well as social benefits for the urban environment. In other words, the study has shown that the success of greening a parking garage is reachable. Therefore the existing built environment requires an intensive vertical and roof greening of sealed surfaces. In contrast to this, the conversion of a parking garage top floor to a public space faces further challenges and requires consideration about the bigger social context, history of an area, its transformation and people's perceptions of the place.

The best practice project Klunkerkranich shows, that an empty parking garage can be filled with new meaning and that public encounter can happen in the secluded niches of the urban transit zones. It has also shown, that appropriation can create publicness by means of territorialization of a space to meet the needs of a social group. Nonetheless, the transformation of a place needs to be constantly reinforced through day-to-day actions to change the collective perception of an unoccupied, socially abandoned and disconnected space.

9 Suggestions for Further Research

Further research is needed in elaborating and developing a theoretical framework on adaptive reuse in connection to parking garages. This thesis was limited on possible environmental and social challenges and benefits of converting parking garage rooftops in Malmö. Therefore, the economic advantages and challenges in allocating additional functions on a parking garage roof deserve further research and investigation. The long term effects of a converted parking garage have not yet been addressed. The best practice example from Berlin has been existing since two years. Therefore long term studies, observations and possible quantitative methods to elaborate the success of the project are suggested for further research.


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4) Are you missing something in Lugnet?
5) How often do you take a walk/ use public facilities/ pass by Lugnet?
   ( ) daily
   ( ) several times a week
   ( ) once a week
   ( ) less then once a week
6) How do you think about the enclosed backyards and front gardens in the area?
   ( ) positive
   ( ) neutral
   ( ) negative
7) Do you know the parking garage P-Hus Anna? Do you use it? How do you think about it?
   ( ) yes  ( ) yes
   ( ) no   ( ) no
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   ( ) yes  ( ) no
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• WHICH DIFFICULTIES AND CHALLENGES DO YOU SEE IN DEVELOPING THE IDEA OF MULTIFUNCTIONAL PARKING GARAGES, IN PARTICULAR ON THE TOP FLOOR?
INTERVIEW QUESTIONS FOR CHRISTIAN DAHLING, P-MALMÖ SALES MANAGER

BACKGROUND INFORMATION ABOUT P-MALMÖ:
WHAT ARE TASKS AND RESPONSIBILITIES OF P-MALMÖ?
HOW IS THE ORGANIZATIONAL STRUCTURE, OWNERSHIP, COOPERATION WITH MALMÖ STAD?

PARKING IN MALMÖ:
HOW IS THE HISTORICAL DEVELOPMENT OF PARKING GARAGES IN MALMÖ? ON WHAT PLANNING INTENTIONS WAS THE RESTRUCTURING BUILT?
WHAT ROLE DO PARKING GARAGES PLAY IN IMPROVING MALMÖ’S TRAFFIC ENVIRONMENT?
DO YOU SEE A DECREASE IN THE DEMAND FOR PARKING ROOM IN MALMÖ?
DO YOU SEE A PARADIGM SHIFT IN MALMÖ’S MOBILITY MANAGEMENT? WHAT WOULD BE MALMÖ’S STRATEGIES ABOUT IT?

NEW, ADDITIONAL FUNCTIONS FOR PARKING GARAGES:
TO WHAT EXTENT IS P-MALMÖ INTERESTED IN GOING BEYOND THE FUNCTIONAL PROVISION OF PARKING SPACE?
DOES P-MALMÖ HAVE ANY PLANS OR STRATEGIES TO GIVE PARKING GARAGES ADDITIONAL FUNCTIONS?
WHICH DIFFICULTIES AND CHALLENGES DO YOU SEE IN DEVELOPING THE IDEA OF MULTIFUNCTIONAL PARKING GARAGES, IN PARTICULAR ON THE TOP FLOOR?