



**CHALMERS**  
UNIVERSITY OF TECHNOLOGY



# Build Housing not Parking

A managerial perspective on parking and mobility  
in Swedish new housing developments

Master's thesis in Design and Construction Project Management

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DIVISION OF BUILDING DESIGN

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CHALMERS UNIVERSITY OF TECHNOLOGY  
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MASTER'S THESIS ACEX30

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### ABSTRACT

Today there are approximately 20 million parking spaces in Sweden, which is more than four parking spaces per registered car. Yet the municipal demands are to build more at every new housing development, even though parking is strongly connected to car use and high greenhouse gas emissions. At the same time, the construction of parking is a considerable part of the construction cost in new housing development. With this as a starting point, this thesis investigates; how Swedish cities are managing parking and mobility today, how parking can be managed more sustainably in the future, and how parking affects the development and building of new housing. As a method for answering this, a survey and interview study have been conducted with involved stakeholders, to get a wide picture of the current situation and future possibilities for change, a complementary document study has been conducted as well. In this thesis, an interpretation of the middle-out framework is used to analyse the different stakeholders' roles in enabling and sustaining the identified need for change within the management of parking and mobility in new housing development in Sweden. This thesis identifies a need for increased sharing around parking and mobility, leading to a need for planning at a neighbourhood level to create a functioning market for parking and mobility. To reach this, there is a need for more evidence-based decisions for stakeholders to be able to make decisions that may be challenging and less popular, differing from current societal norms, and which are aimed at promoting sustainable development. Furthermore, it is of the essence to plan for the cities we want, not basing decisions on the current situation and norms. As future research it is important to further establish how different mobility services correspond to a reduction in parking demand, further evaluate the legal room connected to the issues, as well as the effect a separation of the parking and mobility market from the housing market would have.

Key words: Parking management, Mobility management, Shared parking, Mobility services, Parking purchase.

Bygg bostäder inte parkering

Ett managementperspektiv på parkering och mobilitet i nya svenska bostadsprojekt

Examensarbete inom mastersprogrammet Organisering och ledning i bygg- och fastighetssektorn

ERIK ANDERSSON

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## SAMMANFATTNING

Idag finns det omkring 20 miljoner parkeringsplatser i Sverige, detta innebär att det finns mer än fyra parkeringsplatser per registrerad bil. Trots det finns det kommunala krav på att det ska byggas mer vid varje nybyggnadsprojekt av bostäder, även fast parkering är starkt kopplat till bilanvändning och stora utsläpp av växthusgaser. På samma tema, utgör byggnationen av parkering en betydande del av byggkostnaden i nybyggnadsprojekt av bostäder. Med detta som en utgångspunkt, undersöker detta arbete; hur svenska städer hanterar parkering och mobilitet idag, hur parkering kan hanteras på mer hållbara sätt i framtiden, samt hur parkering påverkar byggnationen av nya bostäder. Som metod för att svara på detta, har en kombination av enkätundersökning och intervjustudie utförts med involverade intressenter, samt en kompletterande dokumentstudie, för att få en bred bild av nuläget samt vilka framtida möjligheter för förändring som finns. I denna studie, har en tolkning av "the middle-out framework" använts som teoretiskt ramverk för att analysera olika intressenters roll i att möjliggöra och bibehålla det identifierade behovet av förändring inom hanteringen av parkering och mobilitet i nyproduktionsprojekt av bostäder i Sverige. Denna studie identifierar att det finns ett behov av ökad delning kring parkering och mobilitet, vilket leder till ett behov av att planera på en områdesnivå för att skapa en fungerande parkerings- och mobilitetsmarknad. För att nå detta, behövs evidensbaserade beslut för att intressenter ska kunna ta utmanande och mindre populära beslut som avviker från de nuvarande samhällsnormerna och som är mer i linje med den hållbara utvecklingen. Vidare är det av stor vikt att planera för de städer vi vill ha, och inte basera beslut på den nuvarande situationen och normer. I framtida forskning är det viktigt att fortsatt fastställa hur olika mobilitetsåtgärder påverkar till en minskning av parkeringsbehovet, att fortsatt utvärdera det legala utrymmet relaterat till frågorna, samt att undersöka effekten en separering av parkerings- och mobilitetsmarknaden från bostadsmarknaden skulle ha.

Nyckelord: Parkeringshantering, Mobilitetshantering, Delad parkering, Mobilitetsåtgärder, Parkeringsköp

# Contents

ABSTRACT	I
SAMMANFATTNING	II
CONTENTS	III
PREFACE	V
GLOSSARY	VI
1 BACKGROUND	1
2 PROBLEM FORMULATION & SCOPE	4
3 FRAMEWORK	5
4 METHODOLOGY	7
4.1 Research strategy	7
4.2 Survey	8
4.2.1 Selection of respondents	8
4.2.2 Design of survey	10
4.2.3 How the survey was sent out and response rate	13
4.3 Interview study	14
4.3.1 Design of the interviews	14
4.3.2 Selection of respondents	17
4.3.3 How, when and where	20
4.4 Document study	22
4.5 Analysis of data	23
4.5.1 Analysing the survey	23
4.5.2 Analysing the interviews	24
5 RESULTS AND DISCUSSION	26
A. THE CURRENT WAY OF MANAGING PARKING AND MOBILITY	27
5.1 The historical perspective of parking	28
5.2 The balancing act of building parking	28
5.3 The possibilities municipalities have to regulate parking	30
5.3.1 Minimum parking requirements	33
5.3.2 Flexible parking requirements	35
5.3.3 Maximum parking requirements	38
5.3.4 Zero parking requirements	39
5.4 The sustainable solutions used today	40
5.4.1 Parking purchase	44

5.4.2	Parking solutions connected to real estate law	53
5.4.3	Community facilities	54
5.4.4	Mobility services	55
5.4.5	Mobility purchase	57
<b>B.</b>	<b>FUTURE WAYS OF MANAGING PARKING AND MOBILITY</b>	<b>59</b>
5.5	Evidence-based decisions	60
5.5.1	Mapping	60
5.5.2	Research and science	63
5.5.3	Evaluation and follow-up	66
5.6	Daring to look forward	67
5.7	Create a market for increased sharing around parking and mobility	70
5.7.1	Planning on a neighbourhood level	71
5.7.2	Permit parking & shared permit parking.	72
5.7.3	Regulation of on-street parking	74
5.7.4	Parking market and Marketplace	78
5.7.5	Mobility market	86
5.8	Making change happen	89
<b>6</b>	<b>CONCLUSION</b>	<b>91</b>
<b>7</b>	<b>FUTURE RESEARCH</b>	<b>92</b>
<b>8</b>	<b>REFERENCES</b>	<b>93</b>
	<b>APPENDIX A</b>	<b>98</b>
	<b>APPENDIX B</b>	<b>107</b>

## Preface

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We furthermore want to extend our thanks to all the involved persons who have been a part of the interviews and the survey, without your answers would this thesis not have been possible. We would also like to thank our fellow students and teachers at the program, you are all a part of laying the foundation of this thesis.

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Gothenburg, 2024



Erik Andersson



Oscar Prytz

# Glossary

**Building permit** = Official municipal permit that gives a developer the right to build or change a building in accordance with municipal regulations.

**Comprehensive plan** = Plan that states the intended use and development of the land and water in the entire municipality.

**Condominium association** = The association that owns a condominium building. The residents living in the condominium building are together owning the association. Called “Bostadsrättsförening” in Swedish.

**Detailed development plan** = Plan that describes how a limited area in a municipality should be built upon and how it is allowed to be used.

**Mobility agreement** = Agreement under civil law where a property owner agrees to supply agreed-upon mobility services for an agreed-upon number of years towards a municipality.

**Mobility services** = Measures taken to increase the accessibility to mobility in properties, usually to reduce the parking number. Includes carpools, bicycle pools, reduced price on public transport, bicycle racks, bicycle cleaning rooms etc. Called “Mobilitetsåtgärder” in Swedish.

**Off-street parking** = Parking spots that are not located on streets. Such as parking garages, parking houses, surface parking etc.

**On-street parking** = Parking spots located on streets.

**Parking number** = The number of parking spots connected to the building permit that the municipality demands a developer to supply.

**Parking purchase** = When a real estate developer or owner satisfies the parking demand in accordance with the parking number by utilising parking capacity outside of the property in question. A sum of money is exchanged while the buying actor is purchasing the right to use the external parking spots. Usually done by free purchase or block rental.

**Block rental** = A parking purchase, where an actor, for instance a real estate owner, rents capacity from another parking supplier to cover their parking supply. Called “Avlösen” in Swedish.

**Free purchase** = A real estate developer or owner pays another party, commonly a municipal parking company, to build parking spaces in a shared parking facility. The sum should reflect the construction cost of the facility. The end users of the facility usually pay rent in accordance with the maintenance costs. Called “Friköp” in Swedish.

**Parking requirements** = Municipal instrument for how parking should be arranged at new or redevelopments. Usually expressed as a minimum number of required parking spots per resident, apartment, BOA etc. Called “Parkeringsnorm” in Swedish.

**Flexible parking requirements** = A real estate developer has the possibility to within a range decide how much parking they are going to supply based on the property’s conditions and what choices they make to influence it. Factors considered are often where in the city the property is situated and what additional mobility services that are being supplied. Called “Flexibla parkeringstal” in Swedish”.

**Maximum parking requirements** = Parking requirements expressed as a maximum number of parking allowed to be arranged at new or redevelopments, usually expressed per resident, apartment, BOA etc.

**Minimum parking requirements** = Parking requirements expressed as a minimum number of parking allowed to be arranged at new or redevelopments, usually expressed per resident, apartment, BOA etc.

**Zero parking requirements** = Parking requirements where the municipality does not demand any parking to be arranged at new or redevelopment.

**Parking space** = A collection of more than one parking spot.

**Parking spot** = Area used to park an individual car.

**Privately owned land** = Land within a detailed development plan that the municipality has decided is not to be used by the public. Includes land for building with housing, retail or industry. Called “Kvartersmark” in Swedish.

**Publicly owned land** = Land within a detailed development plan that the municipality has decided is to be used by the public. Includes streets, parks, squares etc. Called “Allmän platsmark” in Swedish.

**Surface parking** = Parking spots located on ground level. Called “Markparkering” in Swedish.

**Shared parking facility** = Parking facility where parking spots are utilised by different real estate owners and used by their different residents.



# 1 Background

During recent years, it has been more and more highlighted that the climate crisis needs to be handled in the near future to reach a sustainably managed planet earth. The transport sector is a large contributor to climate change and stood for 16,2% of greenhouse gas (GHG) emissions worldwide in 2020 (Richtie, 2020). Of these emissions, a majority stems from road transport which stood for 11,9% of worldwide GHG emissions, a majority of these came from passenger travel vehicles. The same trend can be seen in Sweden where the transport sector is responsible for a third of the country's GHG emissions, with personal vehicles being the single most contributing transport mode (SOU 2021:23). In light of this, the Swedish government has deployed specific climate goals targeted at the transport sector where they have set a national goal to reduce the GHG emissions coming from domestic transport, excluding domestic aviation, by 70% by the year 2030 when compared to 2010 levels.

Global GHG Emissions per Sector

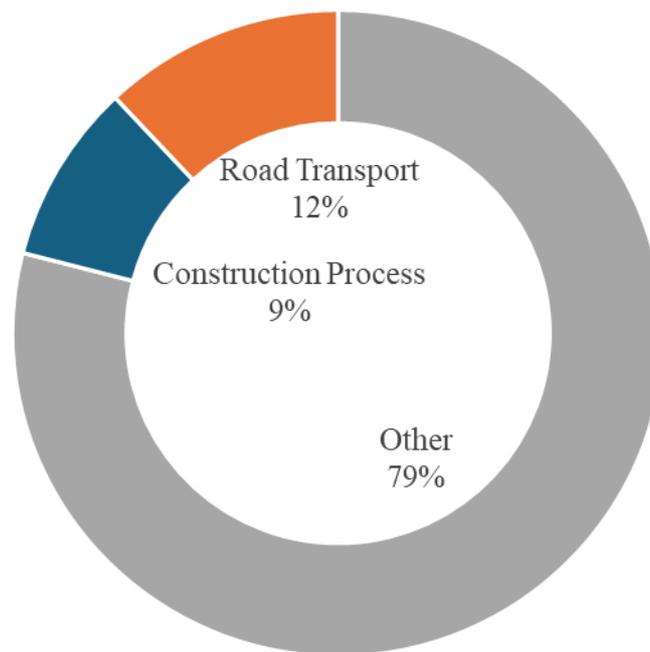


Figure 1.1 Shows the contribution to total global greenhouse gas emissions coming from road transport and the construction process.

Higher use of personal vehicles in cities has also been linked with other issues such as congestion, degradation of the environment as well as having negative impacts on human health and safety (McCahill et al., 2016). Except for the direct negative health impact that the pollution has, it has also been found that exposure to pollutants and noise pollution correlates with a lower level of subjective well-being, meaning a perceived lower quality of life (Eurostat, 2022). These negative externalities as well as the sustainability of the transport system at large can furthermore be linked with goal 11 in the UN's Agenda 2030, sustainable cities and communities (United

Nations, n.d.). The goal includes, except accessible and sustainable transport systems, other subgoals regarding affordable housing, decreasing cities' negative environmental impacts, and accessible green areas among others.

When a personal vehicle is used, the trip usually starts and ends in a parking spot, leading to the availability of parking spaces to be an integral part of the personal vehicle network (SOU 2021:23). The availability of parking has furthermore been found to correlate with the use of personal vehicles (Christiansen et al., 2017; McCahill et al., 2016). If there are easily accessible parking spaces, people are in general more likely to use a car when compared to if the access is of a less accessible kind. Additionally, the decision regarding car ownership is influenced by the parking supply near one's home, if there is an accessible supply of parking spaces where one lives, the likelihood of owning a car is higher (Guo, 2013). The parking of a car has furthermore been found to be a more common occurrence than the driving of one. Shoup (2005) found that cars are driven on average 5% of the time, while being parked 95% of the time, meaning that cars are parked in parking spots for most of their lifespan.

In Sweden today, there are nearly 5 million registered cars (SCB, 2022). There are no solid statistics on how many parking spaces there are in the country but estimates indicate that there are around four parking spaces per car (Fastighetsägarna et al., 2020). Given the statistics with 5 million cars, this would yield an estimate that there are approximately 20 million parking spaces in Sweden. These numbers in combination with the fact that each parking space on average is 25 m<sup>2</sup>, leads to there being around 500 km<sup>2</sup> of parking space in the country. On another note, the average residential area in Sweden is 42m<sup>2</sup> per person and the number of people in the country is roughly 10,5 million, leading to the total residential space being 440km<sup>2</sup> in the country (SCB, 2020). Fastighetsägarna et al. (2020) showed with these calculations that there likely is more parking space than residential space in Sweden today.

All these parking spots must be built as well, and the construction sector stands in total for 37% of worldwide GHG emissions (United Nations, 2023). A significant part of this is operational energy use, but the construction materials used for building parking spots and facilities, such as concrete, steel and bricks stand for 9% of worldwide GHG emissions. Furthermore, are the surface materials of parking spots usually hard surfaces taking away space from promoting greenery and biodiversity (SOU 2021:23). Hard surfaces are putting stress on cities' stormwater systems as they lead to eight times more stormwater runoff compared to if the same area was covered by greenery. In connection to this, the Swedish government has as a part of their strategy for sustainable urban development stipulated that humans and greenery are to be prioritised in the urban space (Regeringens Skrivelse 2017/18:230).

There has been a clear urbanisation trend over the past 200 years in Sweden and cities are becoming more densely built (SCB, 2015; SOU 2021:23). This leads to there being increased competition between different interests regarding how the physical space should be used. The building of parking takes as mentioned up plenty of space and has been pointed out as being a part of the competition for land in cities, leading to less space possible to use for other types of urban activities to support the development of attractive streets (Stockholms stad, n.d.). The space used for parking takes up space outside the streets on privately owned land as well, meaning that space

for parking competes with space potentially used for housing. This competition for space has led to more parking being put in garages underground, which tends to increase production costs as groundwork can become rather expensive (SOU 2020:75). The higher production costs make it more difficult for projects to become profitable, leading to a higher price to pay for the end consumers, usually a tenant, leading to higher rents and less affordable housing. The notion of increased production costs also conflicts with estimates by The Swedish National Board of Housing, Building and Planning, that there needs to be built 67,000 residences annually until 2030 for the country to meet its expected population growth (Boverket, 2023c). Combining this with the notion that the trend in Sweden points towards more people moving into cities, the demand for housing will therefore likely be even higher in cities in the coming years.

Parking regulations have been pointed out as being a key policy measure a city can deploy as a means for regulating car ownership as it strongly correlates with the availability of parking (Fastighetsägarna, 2018). Furthermore, city planners can by regulating parking supply, placement and price also influence travel patterns and flows. Regulating parking has been mentioned together with congestion tax as being one of the most important measures a city can take to improve the overall sustainability of its transport system (Stockholms stad, n.d.). The management of parking is an integral part of the transport system, and how cities are managing their parking supply as well as how and when they decide to build new parking spots are all impacting the likelihood of reaching goal 11 of the UN Agenda 2030 regarding affordable housing, decreasing cities negative environmental impacts as well as accessible green areas (United Nations, n.d.). If parking is handled more thoughtfully, where cities make use of what has already been built, focus on housing and greenery as well and use parking policies as a way of transitioning the transport system could parking regulations be an integral part of contributing to what is stipulated in the UNs' agenda 2030, as well as to contribute to sustainable development at large.

## 2 Problem formulation & Scope

As described in the background, there is a need for more thoughtful, resource-efficient and forward-looking parking and mobility management in Swedish cities to reach a more sustainable transport management and building sector. The aim of this thesis is thus to investigate how Swedish cities are managing parking and mobility today, how it can be managed more sustainably in the future, as well as how it affects the development and building of new housing. The research questions are the following:

### Research questions

- RQ1 How is parking managed in Swedish municipalities today?
- RQ2 How does the management of parking affect the process of development and building of new housing in Sweden?
- RQ3 What barriers and enablers do municipalities, real estate developers/owners and experts within the field identify for the promotion of more sustainable management of parking and who are the key actors in promoting change?

### Scope

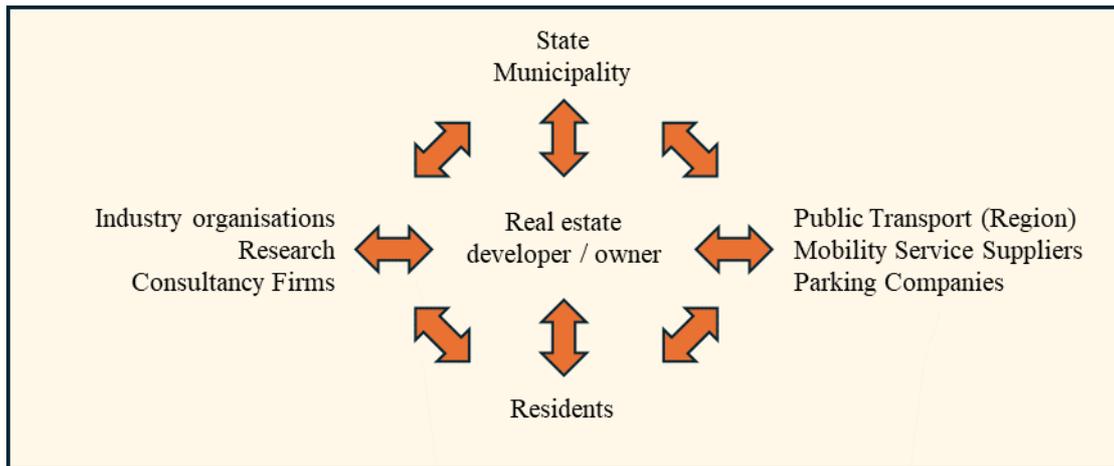
The topic of parking and mobility management in cities is large in scope and involves various sectors and stakeholders. Due to the limitations of this thesis in terms of time, the scope needed to be narrowed to successfully investigate the topic. The thesis has thereby been focused mainly on Sweden. The thesis's main focus has been on parking and mobility management connected to the new development of housing. The same is the case regarding where the parking is located, the main focus is on off-street parking connected to properties, while on-street parking has been included to the extent that it affects the parking situation as a whole. Furthermore, the thesis has mainly focused on municipalities and real estate developers/owners as the main stakeholders; how tenants and the public are affected by the main stakeholders has been brought up as well. The space for loading and unloading of vehicles, as well as disabled parking, has not been considered in this thesis.

### 3 Framework

As a way to structure the analysis in this thesis, looking at the managerial perspective of parking and mobility management, it became clear that there was a need for some sort of managerial framework. In this thesis, an adjustment of the middle-out perspective was used. The middle-out perspective has previously been used in studies such as Eriksson & Olsson (2022), Parag & Janda (2014) and Zohar et al. (2021). The middle-out perspective is a rather new perspective used to analyse and explain change towards sustainability in socio-technical systems (Eriksson & Olsson, 2022). It has previously been developed and used mainly within social science energy system research but has in later years also been used in transport studies, mainly connected to the electrification of the transport sector as can be seen in for example Eriksson & Olsson (2022).

According to the middle-out approach, middle actors play a key role in socio-technical transitions due to their positioning in the middle of the top actors and the bottom actors as well as since they are familiar with and have the possibility to influence both (Zohar et al., 2021). It is important to note that the category of middle actors can vary depending on the context, situation and their position concerning other actors (Eriksson & Olsson, 2022). Likewise, top and bottom actors are not always a fixed and predefined group. It might be that in one context an actor would be regarded as a top actor while in a different context, the same actor would be referred to as a bottom or middle actor. However, within this thesis, the stakeholders will be seen as the same actors throughout the whole analysis. Furthermore, in the middle-out framework, the terms agency and capacity are often used to describe the different actors' roles and possibilities in certain questions. According to Parag & Janda (2014), agency refers to the actor's willingness and motivation to make a certain decision, while capacity can be described as the actor's capability to execute or perform the desired decision. A decision, in this case, a change action, is more likely to happen when both the agency and capacity related to the change are high.

Usually, in the middle-out approach, middle actors can promote change from the middle and out in different directions, upwards, downwards, and sideways (Parag & Janda, 2014). In this thesis, however, the usage of the framework has aimed to analyse how all stakeholders relate to each other and how they can promote change in different directions. In this interpretation of the middle-out perspective, the middle actor will be highlighted, but the classic top-down and bottom-up approach will also be taken into consideration, leading to it being possible for change initiation to go two ways, as well as diagonal between actors, as can be seen in Figure 3.1.



*Figure 3.1 The figure shows the respective actors identified and analysed through the framework used in this thesis, based on an interpretation of the middle-out perspective, as well as the possible directions of change.*

In this thesis's interpretation of the middle-out perspective, the real estate developers/owners will be considered the main middle actors since they have connections to all other stakeholders and have the agency and capacity to engage change in different directions. The top actors are the state or mostly the municipality since they have the planning monopoly and set the rules and laws regarding the subject. The bottom actor in this case is the residents since they are directly affected by the decisions made by the real estate developer/owner and since they do not have as much capacity to drive change. Furthermore, there are other middle actors, such as mobility service suppliers or consultancy firms that could initiate and be initiated to change in certain questions.

## 4 Methodology

In this part, the research strategy as well as the different methods used in this thesis are presented, described, and analysed. The methodology mostly consists of a combination of a survey and an interview study. In addition to this, has a document study been conducted.

### 4.1 Research strategy

In this thesis, the applied research strategy was mainly qualitative with an abductive approach. Generally, it can be described that a quantitative research strategy is used to test a theory, while a qualitative research strategy is used to generate theory (Bell et al., 2022). Since there is a lack of studies taking the overarching managerial perspective of the handling of parking and mobility in the new development of housing in Swedish municipalities, it became reasonable to take a qualitative approach. However, some quantitative research methods have been used to gather large data quantities, such as a survey, but the analysis of the results from the survey has been rather qualitative. Furthermore, an abductive approach is according to Bell et al. (2022), a combination of an inductive and deductive approach, used to overcome the limitations of the other ones. It enables the possibility to go back and forth between empirical data and literature and can be described as a way for researchers to be open to surprises in the data rather than using it to confirm their hypothesis and understanding.

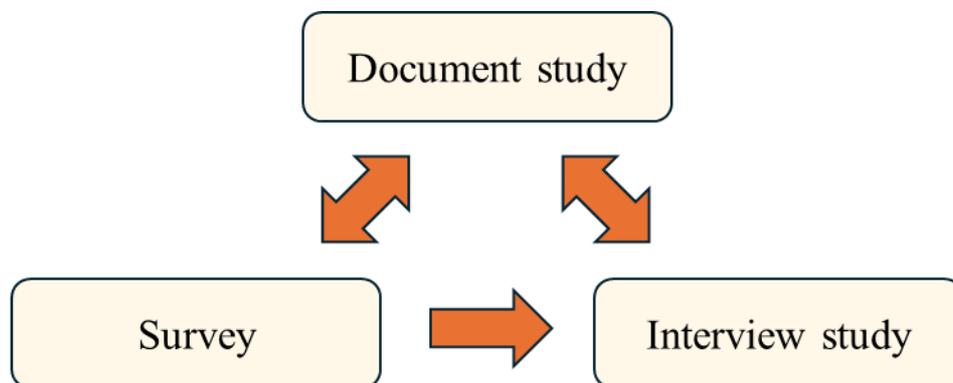


Figure 4.1 The figure shows the selected methods used to gather data and how they correlate to each other using an abductive approach.

As can be seen in Figure 4.1, a survey, an interview study and a document study have been conducted. Since the abductive approach was selected, it was possible to go back and forth between empirical data and literature. The document study was therefore used to create a base of knowledge regarding the topics to strengthen the possibilities of preparing and managing the survey and the interviews, as well as to compare the findings from the survey and interviews with the literature, creating a discussion around the topic. The survey also presented data that could be used to create more fitting questions in the interview study. Since the abductive approach was used, it became logical to focus the thesis on the discussion between the empirical data and the gathered findings from the document study. Because of this, the main part of the thesis is based on this result discussion, as is described more in detail in Chapter 5.

## 4.2 Survey

The aim of the survey was to gather information about how Swedish municipalities are working today regarding topics such as parking norms, flexible parking numbers and parking purchases. A survey was used in this case since it enabled information gathering in a standardised way, hence making it possible to gather large amounts of data at once, compared to other types of methods (Bell et al., 2022). The use of a survey thereby made it possible to map how a large number of Swedish municipalities are working in these matters.

### 4.2.1 Selection of respondents

As the first step in selecting respondents to the survey, it was needed to select which municipalities that were of interest for the thesis. In this process, it was identified that these types of questions most surely mainly affect municipalities with some sort of larger urban development or city. To be able to easily select municipalities within these frameworks, the grouping from the Swedish Association of Local Authorities and Regions (SALAR) was used, as can be seen in Table 4.1 (SKR, 2023). The selected subgroups in this study were the groups A1, A2, B3 and C6, which totalled to 96 municipalities. Furthermore, it was identified that the suitable respondent at each respective municipality were municipal officials with good knowledge regarding these types of issues and questions. The selection process is further described in Chapter 4.2.3.

Table 4.1 *Classification of Swedish municipalities produced by the Swedish Association of Local Authorities and Regions, SALAR (SKR, 2023).*

Main group	Subgroup	Description	Amount 2023
A. Large cities and municipalities near large cities	A1. Large cities	Municipalities with a population of at least 200 000 inhabitants with at least 200 000 inhabitants in the largest urban area.	3
	A2. Commuting municipalities near large cities	Municipalities where more than 40 % of the working population commute to work in a large city or municipality near a large city.	43
B. Medium-sized towns and municipalities near medium-sized towns	B3. Medium-sized towns	Municipalities with a population of at least 50 000 inhabitants with at least 40 000 inhabitants in the largest urban area.	23
	B4. Commuting municipalities near medium-sized towns	Municipalities where more than 40 % of the working population commute to work in a medium-sized town.	63
	B5. Commuting municipalities with a low commuting rate near medium-sized towns	Municipalities where less than 40 % of the working population commute to work in a medium-sized town.	24
C. Smaller towns/urban areas and rural municipalities	C6. Small towns	Municipalities with a population of at least 15 000, but less than 40 000 inhabitants, in the largest urban area.	27
	C7. Commuting municipalities near small towns	Municipalities where more than 30 % of the working population commute to work in a small town/urban area or more than 30 % of the employed day population lives in another municipality.	51
	C8. Rural municipalities	Municipalities with a population of less than 15 000 inhabitants in the largest urban area, very low commuting rate (less than 30 %).	35
	C9. Rural municipalities with a visitor industry	Municipalities in rural area that fulfil at least two criteria for visitor industry, i.e. number of overnight stays, retail-, restaurant- or hotel turnover per head of population.	21

### 4.2.2 Design of survey

To get as much information as possible from the survey, while still maintaining interest from the respondents, it became important to put effort into the design of the survey (Bell et al., 2022). Furthermore, to reach a high response rate, it was necessary to establish interest and minimise the barriers to completion. Because of this, the first thing that was decided was that the survey should be in Swedish since the intended respondents to the survey were Swedish municipalities. Even though the research project is in English, it would only have made it more complicated to answer the survey if it had been in English since a lot of terminology used was subject-specific regarding the Swedish planning process.

When the language was set, the first step in the design of the survey was to establish an introduction or survey guide. The survey guide was attached as the first page of the survey and was intended to create clarity of which thesis the survey was connected to, as well as to inform how the survey would be used and by whom. The survey guide included an introduction to the research aim, a description of who is responsible for the survey, a description of the collaboration with Urbanivation, contact information and instructions on how the survey was built up, as well as the intended time of completion for the survey. The intended time of completion was added since it gave the respondents a feeling of what was expected and how much time they would need to allocate to finish it. In addition to the survey guide, a page with information about GDPR and how personal information and data would be handled for the survey and thesis was added as the first question of the survey. To continue with the survey, it was mandatory to agree to the terms. By making it mandatory to agree to the terms to continue with the survey, it was guaranteed that no information was gathered that did not have the right to be stored. The survey guide and the GDPR page are attached in Appendix A with the rest of the survey.

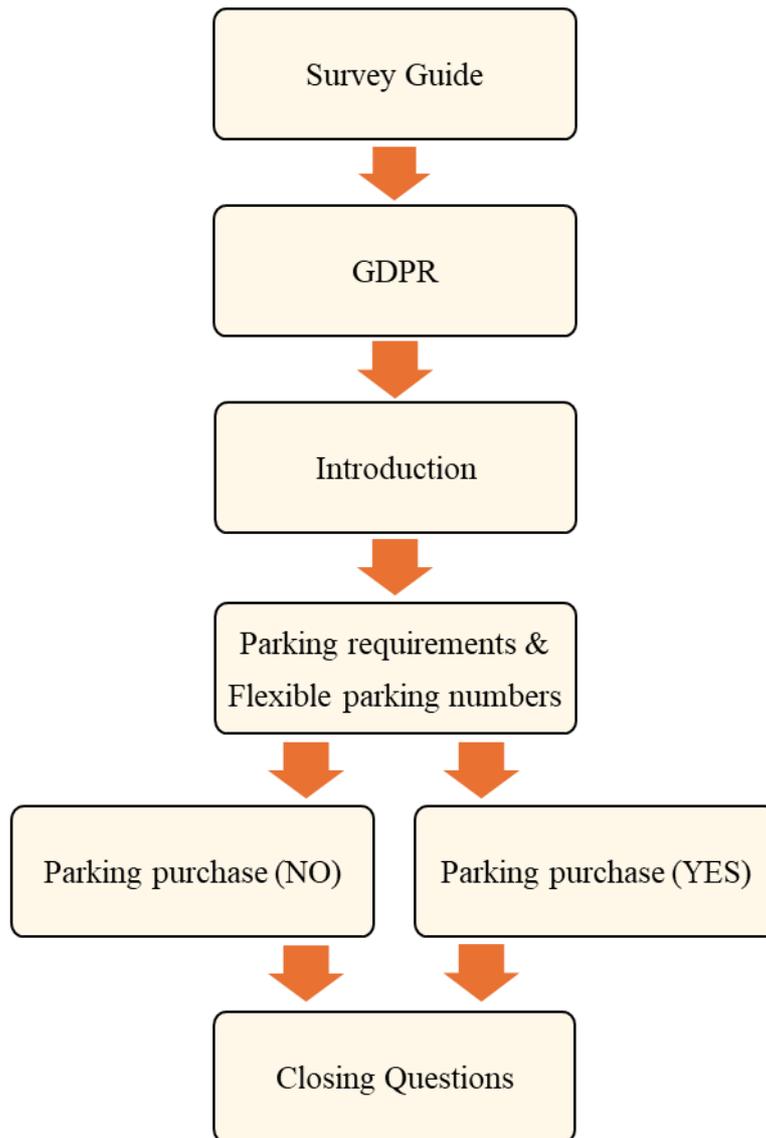
To select the framework and the design of the survey, it was first needed to select overarching themes that were of interest to gather information within. In this process, the project aim was analysed, and it was concluded what type of information that was needed to reach it. In the end, the following themes were selected:

- The planning process and parking norms
- Flexible parking numbers
- Parking purchases

As is described in Statistics Sweden (2016), it is important that a survey has a good framework and structure, hence it becomes important to divide the questions in the survey into different chapters. One way of doing this is to use topic or theme-specific dividing, which was used in this survey. It is also important that each chapter has a clear heading that describes the content of the chapter. The order of the chapter also contributes to the appearance of the study, where the most natural way is to use the funnel technique, in other words, to go from broad themes and questions to more and more specific themes and questions. An efficient way to prevent the respondent from answering unnecessary questions is to use filter questions. A filter question divides the survey depending on the answer to a specific question, presenting different paths forward. A filter question was used in the survey, as can be seen in Figure 4.2, dividing the survey into different pathways depending on whether the respondents answered that they are allowing parking purchases in the municipality or not.

Statistics Sweden (2016) furthermore highlights that starting with easy and interesting questions, in the beginning, is an efficient way to give the respondents a good start and a sense that completion of the survey is feasible. It is also important to not place sensitive questions in the beginning since it can have a deterrent effect. All the tips and best practices presented were used in the survey.

Furthermore, Statistics Sweden (2016) states that there is no scientific proof that the length of a survey is connected to the respondent's completion rate, however, the general understanding is that the longer a survey is, the fewer respondents will complete the survey and the lower will the data quality be, especially in cases with a lack of other incentives to complete the survey. Since it in this case was not possible to create incentives through cash rewards or gift cards, it was necessary to create interest while sending out the survey as well as to create a survey that felt easy to complete. Because of this, it was decided to limit the length of the survey, without compromising the gathering of data too much. In the end, the estimated time became ten minutes which was calculated by the online survey tool used in this study. Furthermore, most of the questions were voluntary to answer since mandatory questions create a risk of respondents not completing the survey if they are unsure of their answer to the question. It was decided that it was better if the respondents skipped a question than not finishing the survey, leading to no answers. Mandatory questions were only used when it was strictly necessary. When the themes and the overall structure were set with regard to the tips from Statistics Sweden (2016), the survey ended up with the structure seen in Figure 4.2.



*Figure 4.2 The figure shows the structure of the survey, highlighting the use of a filter question to divide the survey.*

When the overall structure was set, the creation of the questions within each chapter was formulated. The exact formulations of the questions are presented in Appendix A. However, to prevent the risk of respondents misunderstanding the survey, and complicating the analysis of it, a few general design tips were followed. Firstly, the use of two or more topics or questions within the same question was strongly avoided (Statistics Sweden, 2016). Furthermore, it was important to define the questions in time and space to avoid confusion. Additionally, yes or no questions, as well as multi-choice questions were used to the largest extent possible to make the analysis of the survey more effective. Some open-ended questions were used when it was necessary, for example in situations when it was of interest to gather exact numbers or when the answers to the question were difficult to predict through multi-choice questions.

### 4.2.3 How the survey was sent out and response rate

As described in the chapter above, the design of a survey is highly linked to its response rate. In addition to this, it became important when and how the survey was sent out to get as high of a response rate as possible. An upside with surveys or self-completion questionnaires, is that they are convenient for the respondents since they can complete it when they want and at which pace they want (Bell et al., 2022). Therefore, it was decided to complete and send out the survey early in the project to give the respondents time to answer it. Secondly, it was important how the survey was sent out and how motivated the respondents were to answer. One way to increase the motivation to complete the survey is to make the sending of the survey personalised to the individual respondents (Statistics Sweden, 2016). To do this, it became clear that it was needed to identify relevant employees at each municipality, working with these types of questions. The risk, otherwise, if the survey had been sent to a general email address, was that no one would feel a responsibility to answer it and thereby not be motivated and interested to answer. The search process consisted mostly of internet searches, browsing through municipal websites, relevant documents, and other sites to find the name and contact information of someone involved in working with these questions. In some cases, tips were given on who should be contacted in a specific municipality. Overall, it was most often possible to find respondents, even though it took some time, in other cases it was not possible to find a specific person. In those cases, the municipality was either contacted by phone or by a general email and asked for tips on an employee to contact. In the end, a list of possible respondents was compiled that then later was used when an email was sent out to each respondent. The email was personalised, for example by mentioning their respective name in the beginning yet standardised in most ways. This gave the possibility to send out many emails in a relatively short time span, while still making the email feel personalised. Even though the receiver did not always feel that they were the right person to answer the survey, they most often advised a new person more suited to answer the questions. Furthermore, it is important to follow up on respondents who have not answered, preferably several times through for example emails (Bell et al., 2022). This was conducted in this study to achieve a higher response rate.

As can be seen in Table 4.2, the response rate of the survey differed some between the groups, but overall, the distribution was relatively even. According to Kantar, a world-leading marketing data and analytics business, it is hard to point out exactly what constitutes a good response rate, but an often-acceptable response rate lies between 5-30% and an excellent response rate above 30% (Le Masson, 2023). Furthermore, Kantar describes that a high response rate indicates representativeness, reduced non-response bias, and increased statistical power. This indicates that the total response rate of 74% in this study can be seen as excellent and that the data from the survey should be relatively representative of the whole respondent group.

Table 4.2 Responding municipalities and response rate.

Group	Number of answers	Response rate	Responding municipalities
A1.	3	100%	Stockholms stad, Göteborgs stad, Malmö stad
A2.	32	74%	Huddinge, Botkyrka, Järfälla, Sollentuna, Täby, Sundbyberg, Sigtuna, Tyresö, Värmdö, Vallentuna, Ekerö, Nynäshamn, Håbo, Salem, Vaxholm  Kungsbacka, Mölndal, Kungälv, Lerum, Alingsås, Partille, Härryda, Ale, Stenungssund, Lilla Edet, Öckerö  Trelleborg, Vellinge, Staffanstorps, Lomma, Svedala, Burlöv, Skurup
B3.	16	69%	Linköping, Örebro, Västerås, Helsingborg, Norrköping, Umeå, Lund, Borås, Halmstad, Gävle, Södertälje, Sundsvall, Karlstad, Kristianstad, Kalmar, Östersund
C6.	20	74%	Skellefteå, Karlskrona, Varberg, Norrtälje, Skövde, Falkenberg, Lidköping, Västervik, Katrineholm, Värnamo, Falköping, Karlshamn, Ystad, Karlskoga, Ljungby, Oskarshamn, Ludvika, Mariestad, Avesta, Kiruna

### 4.3 Interview study

The aim of the interview study was to get a deeper understanding of how the different stakeholders are affected by the researched questions and themes, how they are working today, what enablers and barriers they see and what they see as a possible way forward, as well as to get a deeper understanding of the topic. The three stakeholder groups interviewed were real estate developers/owners, municipalities, and researchers, scientists and other experts within the field.

#### 4.3.1 Design of the interviews

The design of the interviews differed in some ways between each respondent group but were structured in a similar manner. For starters, all interviews were designed as semi-structured. A semi-structured interview is a qualitative research method where the interviewer has a list of questions covering the specific topics, often called an interview guide, but where the questions do not have to be presented in the exact same way and where the respondents are free in their answers (Bell et al., 2022).

Furthermore, the interviewer has the possibility to ask questions not included in the interview guide, as interesting topics can arise from the respondents' answers. The use of semi-structured interviews is beneficial since it is flexible and emphasises the respondent's view and understanding of the topics and what they see as extra important. Additionally, all interviews were carried out in Swedish since all respondents were native Swedish speakers and it thereby made it easier for the respondents compared to using English, as well as since a lot of terminology used was subject specific to the Swedish planning process.

As mentioned, all interviews had the same structure, however, the topics covered within each interview depended on which respondent group was targeted. For example, the interviews with municipalities and real estate developers/owners did not cover the exact same topic, even though they were similar. Furthermore, all interviews within the same respondent group had the same overall structure and topics, however, there was some personalisation of the interviews to get as much information from the interviews as possible. The general themes and structure of the interviews in each respondent group are presented in Figure 4.3.

Researchers, scientists, and other experts	Real estate developers / owners	Municipalities
Introduction	Introduction	Introduction
PBL & Parking policies and norms	Strategies and attitude to parking	Strategies and attitude to parking
Flexible parking numbers & Mobility services	The residents' attitude to parking and mobility	Mapping of parking
Parking purchases	Parking policies and norms	PBL & Parking policies and norms
Neighbourhood analysis & Shared parking	The cost of building parking	The municipal planning process
Price of parking & subsidies	Flexible parking numbers & Mobility services	Flexible parking numbers & Mobility services
Closing questions	Neighbourhood analysis & Shared parking	Parking purchases
	Parking purchases	New buildings on old parking lots
	Closing questions	Neighbourhood analysis & Shared parking
		Price of parking & subsidies
		Parking in the real estate management phase
		Standardising of concepts and terms
		Closing questions

Figure 4.3 The figure shows the themes and the structure of the interviews, divided by the respondent groups.

### 4.3.2 Selection of respondents

As established from the framework of the thesis, there are several stakeholders in the question of the management of parking and mobility in new housing developments. The main stakeholder and the middle actor, in this case the real estate developers/owners, became of special interest to interview since they are connected to all other actors. Furthermore, the top actor, in this case the municipalities became of special interest since they have the planning monopoly and set the requirements. In addition to this, it was also selected that interviews should be conducted with especially interesting researchers, scientists, and consultants within the field, to get an expert view on the topics and a further understanding of what the science says. To find interesting and motivated respondents within these groups, a proper selection process had to be done. The first step in the selection process was to brainstorm possible respondents within each group. In this process, discussions with already established industry contacts, as well as an extensive internet search through different search engines, were carried out. In the process of selecting respondents, it should be noted that not all the contacted potential respondents ended up as respondents in the study. The reason for this varied but was mostly due to either a lack of time or a feeling of lack of knowledge within the field. It should be noted however that the interest for the study was high and that a majority of the potential respondents ended up being interviewed.

When selecting potential respondents within the category of real estate developers/owners, it was identified that it was of interest to find a mixture of respondents. From a geographical spread to a spread in type of company, both public or private and developer or manager. In the end, several companies and respondents were selected, as presented in Table 4.3.

Table 4.3 Description of the real estate developer/owner respondents and their respective company.

Company	Private / Public	Developer / owner	Location	Number of respondents	Role
Balder.	Private	Both	Most of Sweden	1	Real Estate Developer
Bonava	Private	Both	Gothenburg, Stockholm, Uppsala, Linköping, Luleå, Umeå	2	Project Managers
Bostadsbolaget	Public	Owner	Gothenburg	1	Business Developer Mobility
ByggVesta	Private	Both	Stockholm, Malmö, Uppsala, Linköping	3	Chief of Project Development & Project Managers
Framtiden Byggutveckling	Public	Developer	Gothenburg	2	Corporate Strategist Urban Development & Head of Sustainability
Genova	Private	Both	Stockholm, Uppsala	1	Chief of Urban Development
Riksbyggen	Private	Both	Most of Sweden	1	Project Manager
Stena fastigheter	Private	Both	Gothenburg, Stockholm, Malmö, Uppsala, Lund, Landskrona	1	Real Estate Manager
Wallenstam	Private	Both	Gothenburg, Stockholm, Uppsala	1	Chief of Land and Development

Regarding the municipalities, the selection of interview respondents was planned in advance, but affected by the results from the survey. It was identified in advance that it was of interest to have in-depth interviews with the three largest municipalities, which can also be seen in category A1 in Table 4.1. In addition to this, it was of interest to do at least one interview with a smaller municipality to get answers to the questions from another perspective. The municipality of Trelleborg was selected since they can be seen as a smaller municipality, and since it could be seen from the survey results that they are using zero parking requirements. In the end, four respondents were selected, as presented in Table 4.4.

Table 4.4 Description of municipality respondents.

Municipality	Department	Role
The city of Stockholm	City Development	Traffic Planner
The city of Gothenburg	The City Planning Administration	Municipal Strategist Mobility and Parking
The city of Malmö	The City Planning Office	Traffic Planner
Municipality of Trelleborg	The Department of Urban Planning and Development	Planning Architect

Regarding the researchers, scientists, and other experts within the field, the selection process of respondents was conducted through a combination of research, searching for relevant respondents within the fields, as well as from getting tips from industry contacts and other respondents. In the end, three researchers or experts and two consultants were selected, as presented in Table 4.5.

Table 4.5 Description of researchers, scientists, and expert respondents.

Name	Company	Role & Description
Åsa Romson	IVL	LL.D. in Environmental Law, researcher, and senior project manager at IVL Swedish Environmental Research Institute, specialising in climate law and sustainable city development. Former Minister for Climate and the Environment and Co-Spokes Person for the Swedish Green Party.
Anders Roth	IVL	Transport and mobility expert at IVL Swedish Environmental Research Institute. Former Head of Environment at the Traffic Administration in the city of Gothenburg.
Frances Sprei	Chalmers University of Technology	Researcher within sustainable transportation with a focus on electric vehicles and alternative fuel vehicles, as well as innovative mobility forms such as carpools and sharing. Economic, political, technical and behavioural aspects are observed, and the goal is to find and evaluate business models and methods to make peoples traveling more sustainable.
Lars-Bertil Ekman	Ekman Stadsutveckling AB	Advisory consultant and Project manager within Urban development and Infrastructure. Former CEO of Anor fastigheter AB, involved in the development of BRF Ciceron at Masthuggskajen. Former CEO of Göteborgs Stadshus AB, and Traffic Director at the Traffic Administration in the city of Gothenburg.
Per Bergström Jonsson	Sweco	Advisory consultant in Traffic planning. Economist, and has previously worked with Climate politics, as well as at the Swedish Transport Administration, and the Traffic Administration in the city of Gothenburg.

### 4.3.3 How, when and where

The interviews were carried out between February and April 2024. A small majority of the interviews were carried out on-site at the respondent's respective office. The rest of the interviews were carried out digitally through a digital meeting service. It was of interest to have the interviews on-site if possible since it made it easier to connect and get a better understanding of how they are working. However, it was up to the respondents to select the location for the interview since the location should not be a barrier to accepting the interview request. The interviews varied some in time, but all were in the timespan of 1-1,25 hours. In addition to this, there was one

interview that was planned to be done through a digital meeting, but which then had to be cancelled, whereupon the answers were sent over in writing through email instead. This was however only an exception. In Table 4.6, it can be seen which type of interview and how long each interview was.

*Table 4.6 Description of how the interviews were conducted.*

Company/Name	Interview Location	Duration
Balder	In person	1 hour
Bonava	In person	1 hour
Bostadsbolaget	In person	1 hour
ByggVesta	Online	1 hour
Framtiden Byggutveckling	In person	1 hour
Genova	Online	1 hour
Riksbyggen	In person	1 hour
Stena fastigheter	In person	1 hour
Wallenstam	In person	1 hour
The city of Stockholm	Through email	-
The city of Gothenburg	In person	1 hour
The city of Malmö	Online	1 hour
Municipality of Trelleborg	Online	1,25 hour
Åsa Romson	Online	1 hour
Anders Roth	Online	1,25 hour
Frances Sprei	In person	1 hour
Per Bergström Jonsson	In person	1 hour
Lars-Bertil Ekman	In person	1 hour

To effectively gather the information from the interviews, it was chosen to record the interviews and to use auto transcription. Recording of interviews is frequently used in qualitative research since it is of interest not only what the respondents say but also how they say it, which makes it important to have the whole conversation stored (Bell et al., 2022). Furthermore, this allowed the possibility of being more active in the interviews, focusing on nuances in the answers and on how to continue the interview with follow-up questions. Since the interviews were semi-structured, this also allowed for time to analyse the questions and skip unnecessary or already answered questions during the interviews to get as much information as possible from the timeframe set for the interviews.

To be able to record the interviews, consent from the respondents was needed. For this, the interview guide was prepared with information about the thesis, how the information from the interview was going to be used, as well as a reference to a GDPR document and contact information. The GDPR document was attached to the interview guide, and it included an agreement on storing personal data, including the

recording, during the time of working on the thesis. During the onsite interviews, a copy of the interview guide and the GDPR document was given to the respondent who then signed it. During the digital interviews, a pdf with the documents was sent over to the respondent before the interview who then signed it before sending it back. The introductory interview guide and the GDPR document is attached in Appendix B.

## 4.4 Document study

In addition to the survey and the interview study, a document study was conducted. The document study aimed to create a base of knowledge within the field to manage the creation and conduction of the survey and interview study, as well as to complement and discuss the interview and survey results with information and conclusions from other reports within the field of study. The procedure of going back and forth between literature and interviews can be seen in Figure 4.1. Bell et al. (2022) furthermore state that a document study is suited to be used with other data collection methods, for instance with an interview study.

A document study is a qualitative research method that includes a wide range of documents from different sources (Bell et al., 2022). Document types that are included in a document study are personal documents, public documents, organisational documents, and media outposts. This thesis has looked mostly at public and organisational documents. The reason a document study was preferred in this thesis over a literature review, was due to the nature of what has been investigated. Issues related to parking and mobility are highly connected to the context and what legal frames there are. A solution that might have worked in one country, might not work in the Swedish context due to national differences and the legislations connected to it. A lot of the information and evaluation of the parking and mobility situation in Sweden has furthermore been published in reports by authorities, industry organisations, consultancy firms and other organisations. Therefore, a lot of focus of the document study has been on these sources. Some academic papers have however been used regarding topics where more general conclusions could be made and where inspiration from other contexts and countries was deemed suitable.

The literature used that was not of the academic kind was as mentioned mostly reports and research from authorities, industry organisations, consultancy firms and other corporations. These were mostly retrieved through the search engine Google, as well as from tips from parties with good knowledge regarding the researched topics, as well as from recommendations by interview respondents who sometimes had relevant literature tips. When searching for sources especially related to the Swedish context was searches done in Swedish, as a lot of the non-academic reports and literature on the subject are written in Swedish. Some searches were also done in English when looking for information that was less exclusively connected to the Swedish context. Keywords used to search were mainly for example parking, mobility, parking management, new developments, housing, parking requirements and maximum and minimum parking requirements. Furthermore, was snowballing used to find sources, meaning that one source referred to another source that was then analysed, the second source then referred to a third source and so on.

The academic literature was gathered using academic databases such as Scopus and Google Scholar, as well as through Chalmers Library. It was both digital and physical

publications. When academic databases were used to retrieve academic papers was different keywords used to find suitable literature. The keywords that were mainly used were for example parking, mobility, parking management, new developments, housing, parking requirements, and maximum and minimum parking requirements. To specify the search results even more and to be able to combine different keywords was Boolean operator used, as this is a way to limit and widen the search results in academic databases (Chalmers Library, 2024). Boolean operators used were AND as well as OR. Using AND between keywords leads to all stated keywords being included in the search. An example of a combination used in this thesis was “parking AND management”. OR between keywords is used to widen the search when keywords have synonyms that can be used for describing the same thing. An example of a combination used in this thesis was “spot OR space”. Additionally, was snowballing used in finding academic literature as well. A list of the retrieved documents, sources and academic literature can be found in Chapter 8 References.

## **4.5 Analysis of data**

The data collected from the survey and the interview study needed to be broken down and analysed for further evaluation, discussion, as well as comparison with the other methods used in line with the abductive approach. The survey was analysed mainly quantitatively, and when the results were evaluated and compared with other sources of data was this done qualitatively. The interviews were analysed qualitatively with the use of thematic analysis.

### **4.5.1 Analysing the survey**

After the survey results from the municipalities were collected and when the end date of the survey was reached, the answers needed to be compiled, structured, and analysed to be able to make further comparisons and draw conclusions from them. Some inspiration was gathered from (Bell et al., 2022) in that the survey analysis was planned in conjunction with designing and formulating the survey. The risk otherwise is that the data might be found difficult to use for the intended purpose.

The first step was to compile all the answers. When all the answers were collected, they were exported to a common Excel file to enable easier overview and comparison. All answers were looked over, unclear answers or when answers were missing, were complemented through email with the respondent or by using official municipal documents for clarifying and additional information. A majority of the questions were close-ended questions, meaning that answer alternatives were given. These answers were compiled and categorised by municipality, SALAR category of the municipality, and by question. The answers were further broken down into percentages and visualised in figures, which were presented in total or divided by the SALAR categories. The division by SALAR category was done to see if there were any differences in answers depending on the size of the municipality. The answers were then used for further evaluation and comparison with interview answers and related literature in line with the abductive approach. These figures, their evaluation and discussion can be seen in Chapter 5 Results and discussion.

As stated, most of the survey questions were close-ended, where answer alternatives were given, there were however a few open-ended questions. The analysis of these

varied as some of them were included to further deepen the understanding of the subject. An example of such a question was if the municipality was using any supporting tools in the building permit process. Two other open-ended questions were, if the municipality is not using parking purchase, why are they not using it? And if it is something that they might consider using in the future? The idea behind these was to get a deeper understanding of the parking purchase trend in the country. The answers to these questions were however mostly opinion-based and a significant part skipped them, leading to no proper analysis being able to be conducted. Additionally, was one of the final questions open-ended, this was if they wanted to add anything that they felt was missing from the survey. This question was mostly for deepening the understanding of the subject, thus was no proper analysis done. There were three quantitative open-ended questions, which were connected to the municipal price of parking purchases. Not all municipalities had the information on this, some did not have fixed prices, but a significant part did have fixed prices and reported these in the survey. The numbers that were provided were further compiled and categorised by municipality and SALAR category of the municipality. The numbers were further looked over to make sure that they were reasonable. The numbers were then ordered by the parking purchase price and visualised in a figure. The results were further evaluated and discussed with findings from the interview and document study. A visualisation of the data on parking purchase price can be seen in Figure 5.9.

## **4.5.2 Analysing the interviews**

After the interviews had been conducted, the data collected needed to be worked with for further evaluation. The interviews, both the once conducted physically and digitally, were recorded through an online meeting service. The reason for using it was because the application produces a transcript automatically, meaning that some time could be saved when transcribing. When all of the interviews had been conducted, the interviews were listened through, and the automatic transcripts were also gone over to correct formulations that the application got wrong and to separate questions from answers in the text etcetera. All of the transcripts were written in Swedish since the interviews were conducted in Swedish.

During the relistening and transcription of the interviews, a thematic analysis was conducted. A thematic analysis is a qualitative research method where the data is examined by identifying themes in the data (Bell et al., 2022). A theme can be described as repetitions or patterns in the data, statements that relate to the research's aim or research questions, data familiar to the researcher, or data that provides a better understanding of what is being researched.

When the thematic analysis was being conducted and a theme was identified, the theme was given a colour and the text in the transcript related to the theme was coloured. This was a way to distinguish what information that was related to each theme, which made further analysis easier. After the interviews had gone through this procedure, all the coloured text was transferred to a common Excel file and divided into different sheets based on the respective themes. The text was further divided by respondent as well. The text was then summarised, compiling the essence of the respondents' statements, and highlighting the most visualising quotes as well. At this stage, the text was still in Swedish, leading to the summarised text then being translated into English for further analysis. The summarised texts were then moved to

a Word document, the text was firstly divided by category of respondents, secondly by theme, and thirdly by the respondent. This was deemed to enable a better overview of the data. This data was then used for further evaluation and comparison with survey results and related literature, which can be seen in Chapter 5 Results and discussion.

## 5 Results and discussion

This chapter presents a combined results and discussion part, meaning that the results gathered from the survey and the interviews are presented and compared, as well as discussed with each other and with complementary information from the document study. Furthermore, the chapter is divided into two sections, A and B, as shown in Figure 5.1. In the first section, Section A is the history and the current state of the management of parking and mobility in new development of housing in urban areas presented, discussed, and problematised. The findings from Section A are then analysed resulting in future improvements and recommendations that are then presented and discussed in Section B.

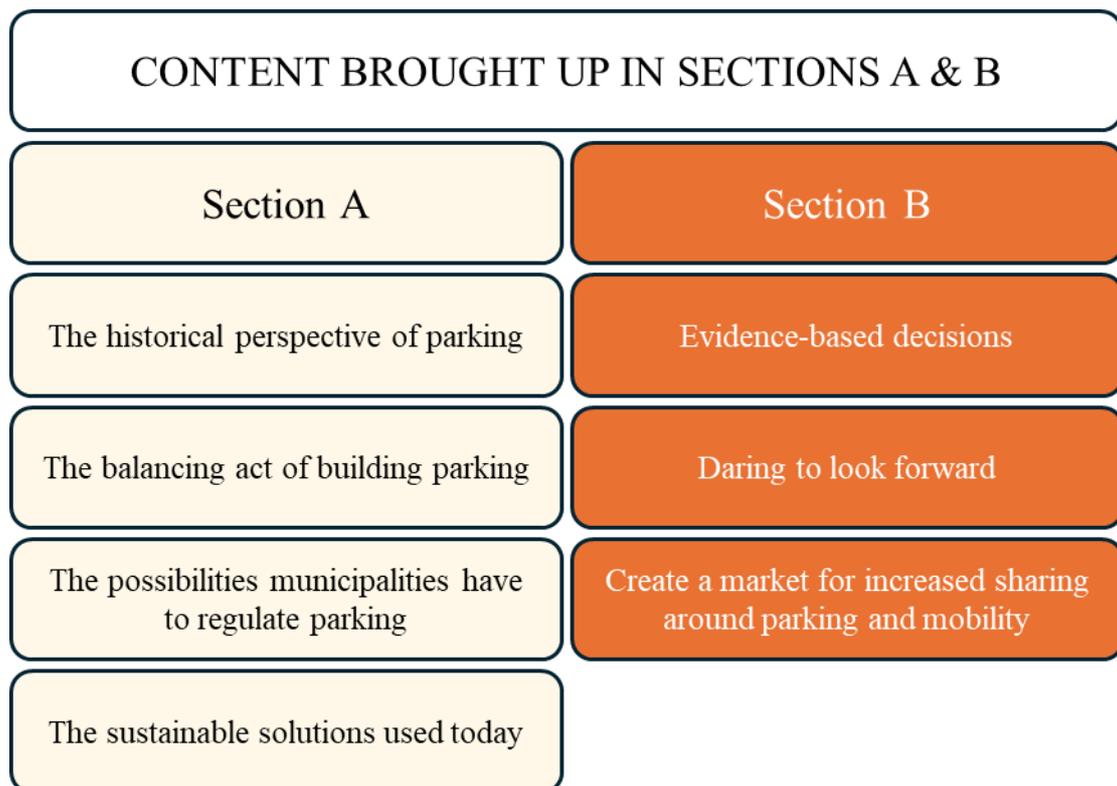


Figure 5.1 Shows what content that is presented in Section A and B of Chapter 5 Results and discussion.

## A. The current way of managing parking and mobility

In this section, Section A is the history and the current state of the management of parking and mobility in new development of housing in urban areas presented, discussed, and problematised. As shown in Figure 5.2 below, is this part divided into four main themes. The historical perspective of parking is giving a brief overview of why the situation looks as it does today. The balancing act of building parking presents the cost of building different parking facilities, as well as the discussion of the balancing act between different interests regarding parking. The third part is lifting what possibilities municipalities have to regulate parking, including legal boundaries and different types of parking requirements. Lastly, the fourth part presents which sustainable solutions are used today to reach a more sustainable management of parking and mobility.

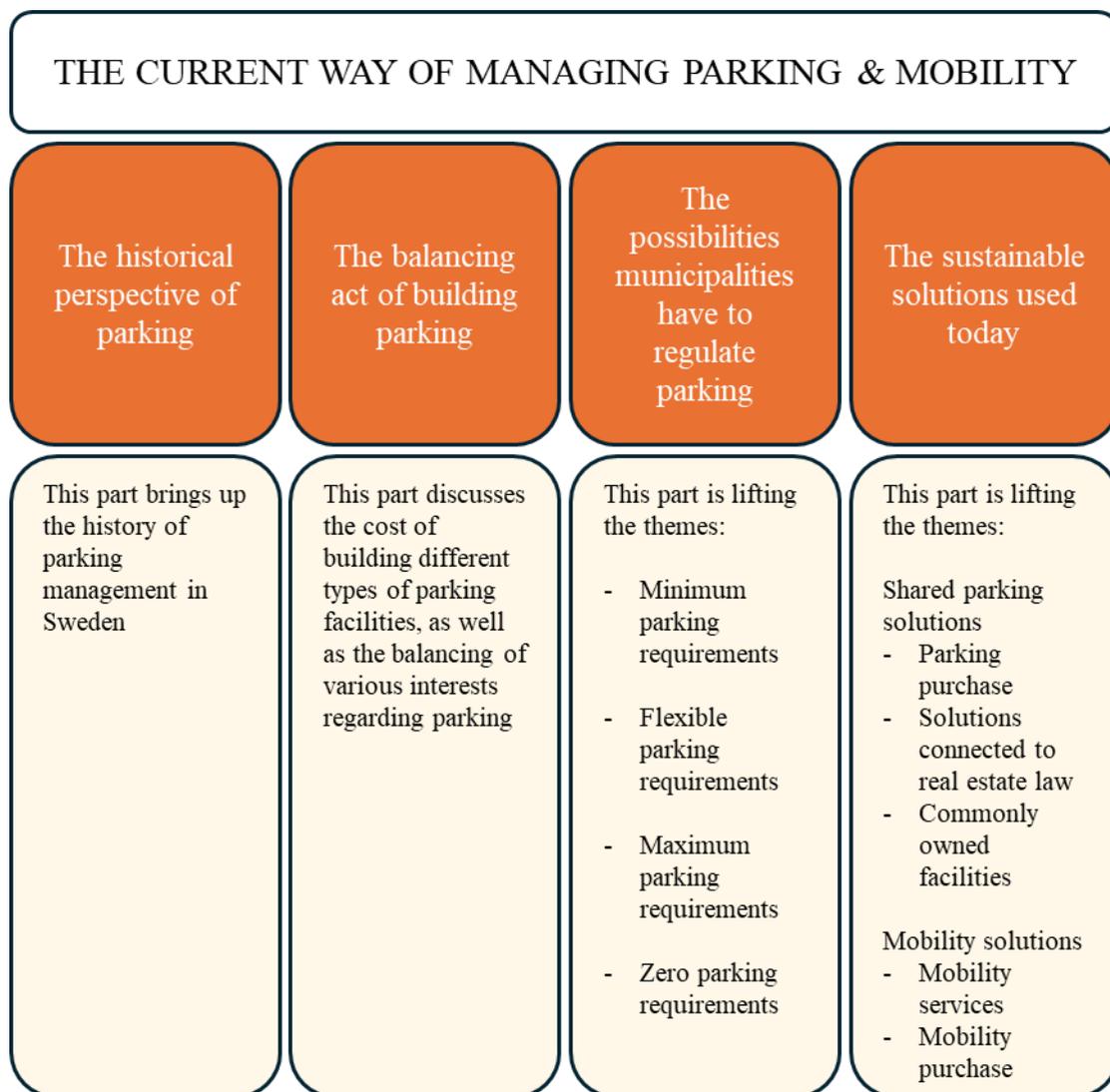


Figure 5.2 Shows what content that is presented in Section A of Chapter 5 Results and discussion.

## 5.1 The historical perspective of parking

The way parking is managed in new developments today in Sweden is a remnant from the 1950s when creating sufficient space for the parking of cars was regarded as a challenge (SOU 2021:23). A parking investigation was conducted in 1955 where inspiration was gathered from the United States of America. As a result of the investigation, a mean value for the minimum required number of parking spots per resident in Sweden was produced. The investigation also considered a future increase in car ownership, and thus a higher future demand for parking. In 1960, regulations became statutory, and real estate owners were demanded to supply parking in new developments and the already built environment. Following this thought the mobility expert A. Roth views today's parking situation as remains of an old norm in society where the car has been synonymous with mobility. This has led to it historically being an oversupply of parking, as well as a structural constraint in favour of the car. Connected to this, the legal expert Å. Romson sees the legislation governing parking in new developments on privately owned land, The Planning and Building Act (PBL), as a remnant of an old parking ideal where monitoring was considered something modern and positive. The mindset of building with a focus on the car has generally been left in the past in most of the Swedish transport policies, however is parking an exception (Hamilton & Braun Thörn, 2013). The remains of fixed minimum parking requirements have been standard procedures in many Swedish municipalities in to the 2010s and the historical way of working with fully supplying the demanded parking as well (SOU 2021:23). This has led to the car traffic becoming integrated into the built environment and the city planning in many Swedish cities.

## 5.2 The balancing act of building parking

How much parking is being built differs from project to project based on several parameters. According to P. Bergström Jonsson, it becomes a balancing act for the real estate developer to find a good balance where they can attract residents to rent or buy, without having to spend as much money. Building parking is costly, but it can at the same time be used to attract residents. There are no exact numbers regarding what different types of parking facilities cost to build, but according to P. Bergström Jonsson is the average prices rather similar regardless of whether you are in Stockholm or Alingsås. It is the same building regulations and the same material costs; the only difference is the salaries that are slightly higher in the larger cities. Since it is not possible to look at exact numbers, estimations and average pricing become interesting and important to get a sense of the proportion of how large the cost is.

Examples of estimates, presented by Fastighetsägarna et al. (2020), based on the city of Stockholm show that the cost of building one surface parking spot on a paved area is 10 000 – 15 000 SEK, parking deck 50 000 – 100 000 SEK, above ground multi-story parking facility 100 000 – 300 000 SEK and in regular underground garage 350 000 – 450 000 SEK. Furthermore, Fastighetsägarna et al. (2020) state another example where it did cost 580 000 SEK per parking spot to build 1650 parking spots in an underground garage in Stockholm. The respondent from Wallenstam stated similar rough estimates of what a parking spot in different parking facilities can cost to build. A surface parking spot is 50 000 SEK, the easiest form of a parking deck above ground is 150 000 SEK, a well-designed underground parking garage is

300 000 SEK, as well as an underground parking garage with bad geotechnical conditions 400 000 – 450 000 SEK. Other estimates as mentioned by the consultant P. Bergström Jonsson for what it costs to build one parking spot in an underground parking garage is around 600 000 – 750 000 SEK. An additional example, that is a bit more on the high end of what it can potentially cost to build parking in an underground garage, is the project Skeppsbron in the city of Gothenburg. It was calculated that the planned parking spots in an underground garage would approximately cost 1,2 million SEK per parking spot (Göteborgs Stadshus AB, 2023). The same project is taken up as an example by Riksbyggen, lifting that the project being situated next to a river, would make the geotechnical conditions rather complicated to build in, leading to the high estimated construction cost. The plan to go through with this project has been put on hold. When Genova is building parking spaces in underground garages are they roughly calculating with a construction cost of 500 000 SEK per parking spot.

As can be seen, by the stated cost estimates in the paragraph above, the different project-specific reasons make it hard to give standardised cost examples of what different parking facilities cost to build. What can however be said, as stated by the consultant L-B. Ekman, is that building parking, in general, is expensive. The differences in calculated costs are furthermore depending on how one calculates the cost. The respondent from Riksbyggen means that depending on where in the cost calculations for the entire project the cost of the different parts of the property are included will lead to a different calculated cost for the different parts. For example, in the case of an underground garage can one ask how much of the cost for the foundation work that should be attributed to the cost of the garage, or if the cost of the ceiling should be attributed to the underground garage in some way. Riksbyggen furthermore means that you often are calculating both extremes, the highest and lowest possible cost, and then going forward with the mean value. An example from Uppsala shows that the cost for the construction of parking corresponds to approximately 20% of the total construction cost in housing projects (Fastighetsägarna et al., 2020).

Regarding what parking solution real estate developers decide to build depends on what a specific project in question allows for. The respondents from ByggVesta state that they would like to build surface parking since it is the most cost-effective, they do however see that this is not always possible because of the lack of space on the properties. An additional point ByggVesta mentions as well is that surface parking is not contributing to a pleasant urban area. The respondent from Genova follows this line of thought and states that parking is expensive and that there is a balancing act between the amount of parking and the amount of housing. If they are building parking spots in an underground garage, then the parking solution becomes expensive. By locating the parking spots underground, they do however have more space above ground to build housing on, meaning more money coming in. It becomes the other way around regarding surface parking solutions, they are less expensive but lead to less housing being built. The respondent from Riksbyggen means that the parking solution chosen is influenced by land prices. Building parking spots in underground garages is more common in cities where the price of land is higher, and developers want to maximise the amount of space being used for building housing. It is the other way around in more peripheral places where the price of land is low, then surface parking solutions are more common as the cost of land and space is not considered a

problem for building housing. On a similar note, as Riksbyggen and Genova, do the respondents from Framtiden Byggutveckling state that it is also of interest to look at the alternative use of the space used for parking, how much more housing could be built on the space used for parking, or what city development could be achieved. They furthermore emphasise that regardless of the estimated construction cost, is it important to not forget what the end goal of the project is.

The desire to have access to parking differs, according to the respondent from Wallenstam, between different demographics of residents. However, as stated by the respondent from Stena fastigheter, their residents do in general want parking spots. This means that in addition to balancing parking and apartments, companies must also balance the residents' desire to have access to parking and what it costs to build the parking spots. An example the respondent from Genova mentions is that they have had examples of condominium projects where sufficient parking had been supplied through parking purchase, but where they still decided to build parking spots in an underground garage since the ones buying the apartments requested it. They do however mention that the reason the economic calculation added up in this case was due to it being a high-end project, and that this would probably not have worked with another demographic or if the economic landscape would have been different. The respondent from Wallenstam follows in this and states that in condominiums is it sometimes a requirement to be able to sell the apartments that every apartment has access to a parking spot, sometimes even in an underground garage. As mentioned, does the desire to have access to parking differ between different demographics, what can be that is that the desire is generally higher in larger condominiums and lower in smaller rental apartments. In general, can it be said that the desire to have access to parking differs between different demographics, it is higher in larger condominium apartments and lower in smaller rental apartments. Since the desire differs is it important to know the intended demographic and their parking desires to choose a suitable parking solution and quantity of parking spots, for the economic calculations to add up as much as possible.

To conclude, it can be said that there are no exact numbers for the costs of building a parking spot. What can be said, however, is that the building of parking spots is a considerable cost in housing projects. What the calculated cost is depends on for instance the type of parking facility, the geotechnical conditions, the cost of land and how the construction cost is being calculated. Additionally, it is worth considering the alternative cost as well, in what other ways could the space dedicated to parking be used instead. Furthermore, it should be stated that parking most often does not cover its own cost, leading to subsidisations, which need to be included in the balancing act. This will however be elaborated more in Chapter 5.7.3.

### **5.3 The possibilities municipalities have to regulate parking**

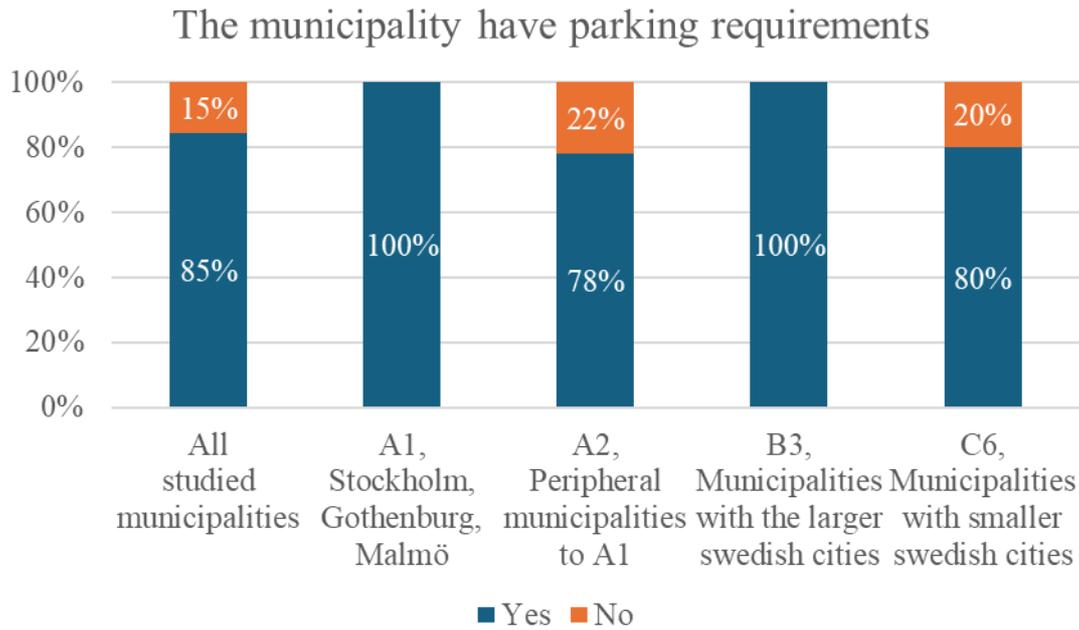
One of the main ways in which the municipalities are governed regarding how they can manage parking is through 8 Ch. 9 § 4 p. in the *Planning and Building Act* (SFS 2010:900), PBL for short. The legislation states that real estate owners have the responsibility for supplying the demand for parking that the municipality determines is generated by the property's use (Boverket, 2023b). PBL (SFS 2010:900) 8 Ch. 9 § 4 p.:

*9 § an unbuilt property that will be built upon shall be arranged in a way that is suitable regarding the city- or landscape or to nature- and cultural values of the location. The property shall be arranged so that:*

*4. it on the property or in close proximity to a reasonable extent is suitable space for parking, loading and unloading of vehicles.*

This means according to the legislation that parking provision generated by properties is the responsibility of the respective real estate owners and that it is not a municipal concern unless the municipality is the owner of the property in question (Boverket, 2023b). Similar to this, the legal expert Å. Romson states that PBL chapter 8 § 9 makes no clear distinction between parking space and living space and that the paragraph intends to uphold a distinction between what is the responsibility of the private and the common, and that parking is something that should be taken care of by the real estate owners and not by the common. The idea with this is that cars should be parked off-street on the respective properties and not on publicly owned land. However, does the municipality of Trelleborg view the intended distinction of responsibility as not always being clear, and that defining where the responsibilities lie also depends on where one's interests lie.

Despite the real estate owners having the responsibility for supplying parking in conjunction with properties is it the municipality who has the responsibility for the planning of the parking (Boverket, 2023b). The municipality must ensure that the design of the built environment is suitable for the city- and landscape and that nature and cultural values are taken into consideration in the planning. Furthermore, must the planning of the parking be in line with the transport system and the city's goals as well as that different groups of travellers' needs are met. To achieve this is it of value to incorporate the planning of parking in the comprehensive planning and to formulate a parking strategy. In addition to this, there is a possibility to specify it further in specific parking requirements.



*Figure 5.3 Shows how many of the surveyed municipalities that are working with parking requirements, showed in total and divided by SALAR categories. n = 71.*

As can be seen in Figure 5.3, most of the Swedish municipalities, 85%, are working with some sort of parking requirements as a means of planning and regulating the parking supply in the municipality. Using parking requirements furthermore ensures that the municipality fulfils their legal demands following the *municipal law* (SFS 2017:725) 2 Ch. 3 § which is the principle of equality. This law states that all members of a municipality are to be treated equally unless there are no substantive reasons indicating otherwise (Boverket, 2023a). In the case of parking and real estate developers and owners does this mean the municipality should treat them equally when evaluating their need to supply parking. According to the consultant P. Bergström Jonsson does this in practise mean that the municipality must give a new developer the same conditions as the last one when working towards fulfilling the municipal parking demands. He furthermore states that having parking requirements as a clear rulebook, rather than an open discussion regarding what the requirements are, makes it easier for the municipality to ensure the principle of equality.

In Figure 5.3 can it be seen that there is no clear distinction between the size of the surveyed municipalities and them working with parking requirements. There is a small tendency that municipalities in categories A2 & C6 are working with parking requirements to a slightly lesser extent, a large majority is however still working with parking requirements. The ones not working with them can likely be explained by the smaller population and lower density of buildings in the municipalities. These findings are in line with what the mobility expert A. Roth states, that working with parking requirements has become the legal practice in Swedish municipalities as a means to interpret what is stated in the PBL. Roth does however say that the parking requirements sometimes are wrongly viewed as a law when they in reality are regulations that the municipalities govern themselves. The city of Gothenburg recognises that the PBL is affecting them in the way they formulate their parking

requirements. However, they acknowledge that they as a municipality have interpretive priority, which gives them flexibility in the way they interpret the legislation. For example, it is stated in the PBL 8 Ch. 9 § that parking should be provided on or in close proximity to the property in question, in the city of Gothenburg have they interpreted in close proximity as meaning 700m.

The more concrete discussions regarding how the parking solution is to be designed are regulated by the municipality in the detailed development plan (Boverket, 2023b). The city of Gothenburg starts the discussions regarding parking with developers even earlier if the project is something extraordinary. The respondent from the city of Gothenburg does however state that issues related to parking rarely are the most urgent in these early planning stages. In general, should the detailed development clarify who is doing what concerning parking, will mobility services be provided or will parking be provided through parking purchase. The same procedure is conducted in the city of Malmö, and the time when the discussions regarding parking are initiated depends on the size and complexity of the project in question. The parking number is developed throughout the detailed development plan process from what is stated in the parking requirements. The final parking number is set when the building permit is given. The parking number is connected to the building permit, and the changing of a parking number is a building permit regulated question, meaning that if the municipality were to give a new parking number, then they also need to give a new building permit to the real estate owner.

### **5.3.1 Minimum parking requirements**

The most common way that Swedish municipalities are working with regulating parking in relation to the PBL demands in their parking requirements is by using minimum parking requirements (SOU 2021:23). With minimum parking requirements, it is meant that a property is given a minimum number of parking spots that it needs to be supplied. The idea with the regulation through minimum requirements is that they guarantee the municipality that real estate developers fulfil their obligations in providing a sufficient amount of parking. Looking in a broader European context is parking usually managed at a municipal level as well, and minimum parking requirements have historically been and still are the most common way that parking is managed in European countries (Mingrado et al., 2015; Gies et al., 2021). Another example of a city where minimum parking requirements are used is the city of Copenhagen (City of Copenhagen, 2019).

A benefit of working with minimum parking requirements that have been lifted from the respondent at the municipality of Trelleborg is that minimum parking requirements are giving the municipality good predictability of how many parking spots that will be constructed. The city of Gothenburg is working with minimum requirements and the respondent sees this as working well as long as the required number of parking spots is low, and the requirements work as a way of encouraging the construction of housing. The same can be seen in the city of Malmö which is working with minimum parking requirements, and the respondent views it as a good way of staying in line with what is stated in the PBL. Their requirements are forecast-driven as they see a future with fewer cars in the municipality, their idea is that supplying a little bit less parking than what there is a demand for will lead to an easier shift to a city with fewer cars. They are however aware that this strategy could lead to

a shortage of parking in the short term but state that the car ownership should adapt over time to the changed parking situation. The city of Stockholm is also working with minimum parking requirements, the respondents see the upside in this in that they fulfil the demands from the PBL, it enables an equal treatment of developers, and it leads to parking being constructed off-street and thus cars being parked there and not on the streets.

The respondent from the city of Stockholm mentions the downsides with minimum parking requirements being that they can be considered as contradictory as they demand developers to construct parking spots for cars, at the same time as the municipality wants to reduce car traffic. They acknowledge that the municipality interfering and monitoring, to make sure that developers fulfil their obligations, uses municipal resources and tax money, something that risks contributing to a view of the municipality as being bureaucratic and as unable to leave things alone. Another downside the respondent from the city of Stockholm sees is that demanding the construction of parking could prove itself as expensive for developers, thus inhibiting the construction of housing. On the same note, parking spots are space-demanding, also taking up space from additional housing being built. Similarly, the respondents from Bonava argue that in cases where too many parking spots are built and where there is a high vacancy rate can it become financially challenging for condominium associations, leading to the association increasing the fee for the residents. They mean that this can be viewed as a failure in that the developer builds parking to meet the minimum requirements from the municipality, the association has taken on loans to financially cover this construction, and then they still need to increase the fee because the parking spots are not being used. In general, do the Bonava respondents view minimum parking requirements as being inhibitive and imperative, and that they prevent real estate developers' ability to work with parking and mobility in flexible and innovative ways. Shoup (2018) takes this thought one step further and means that minimum parking requirements increase the cost of building and decrease the supply of affordable housing.

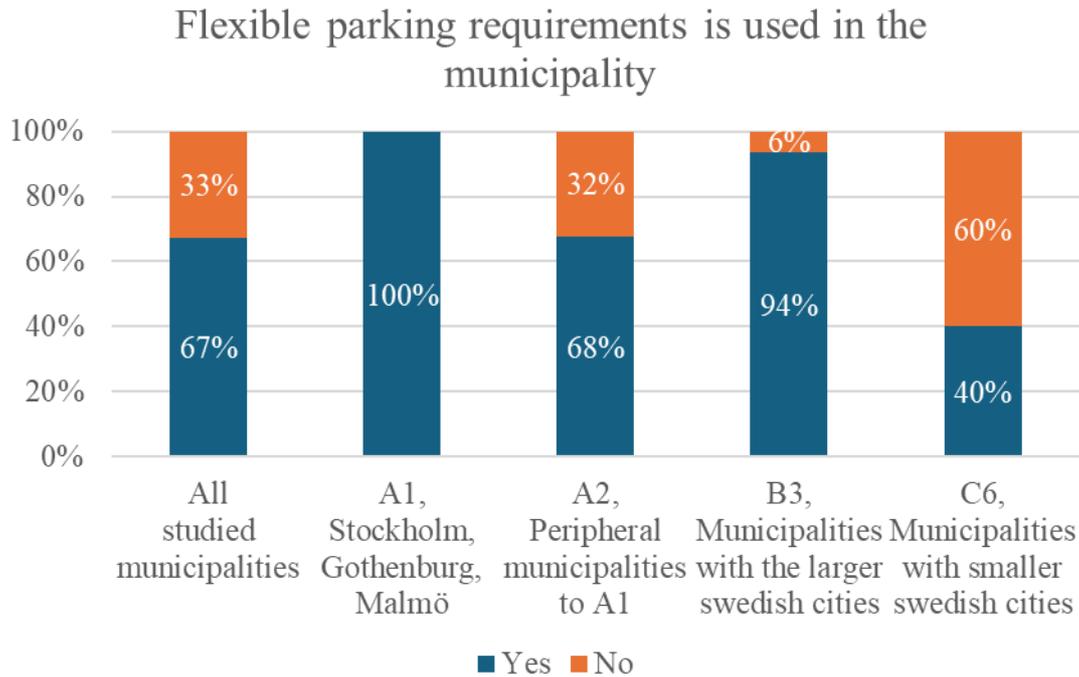
How the minimum parking requirements are designed differs between municipalities. In the same way that it is slightly more common to have parking requirements in larger cities, the respondent from Wallenstam sees that the demands in minimum parking requirements in larger cities often are lower and tougher. In larger cities it is more common to work towards having less parking and lower car use, while in more peripheral cities is the minimum requirements usually higher as the car is the norm for mobility and it is expected to park one's car right outside one's door. The respondent from Balder sees the same thing, that peripheral municipalities in general have a stronger car dependency leading to more parking being built. The researcher F. Sprei mentions the differences in requirements between municipalities as possibly something good, as all municipalities have different prerequisites and can make decisions based on what is best for their inhabitants. Sprei does however acknowledge that the differences lead to developers having to change their way of working between different municipalities which leads to an indirectly increased cost for developing housing, possibly leading to a higher cost of building. The consultant P. Bergström Jonsson expresses similar thoughts, that differences in requirements between municipalities increase the indirect cost of developing projects for developers. However, he states that the Swedish public administration structure is set up on

municipalities being rather self-governing, which makes standardisation more difficult to implement.

### **5.3.2 Flexible parking requirements**

Flexible parking requirements can according to the mobility expert A. Roth, be described as when the municipality gives the real estate developer or real estate owner a range of how much parking they should provide based on surrounding circumstances and what choices the developer or owner makes to affect the circumstances. They have the choice to be more or less ambitious. On a similar note, according to the city of Stockholm, the term flexible parking requirements include that the developers can lower their parking number through the use of mobility services. The Swedish National Board of Housing, Building and Planning, in Swedish, called Boverket, has a similar description in that the municipality gives the developer the possibility to arrange less parking than what the original parking requirements require if the developer is arranging mobility services that are considered to possibly decrease the resident's car use, as well as to making it easier to use alternative modes of transportation (Boverket, 2022).

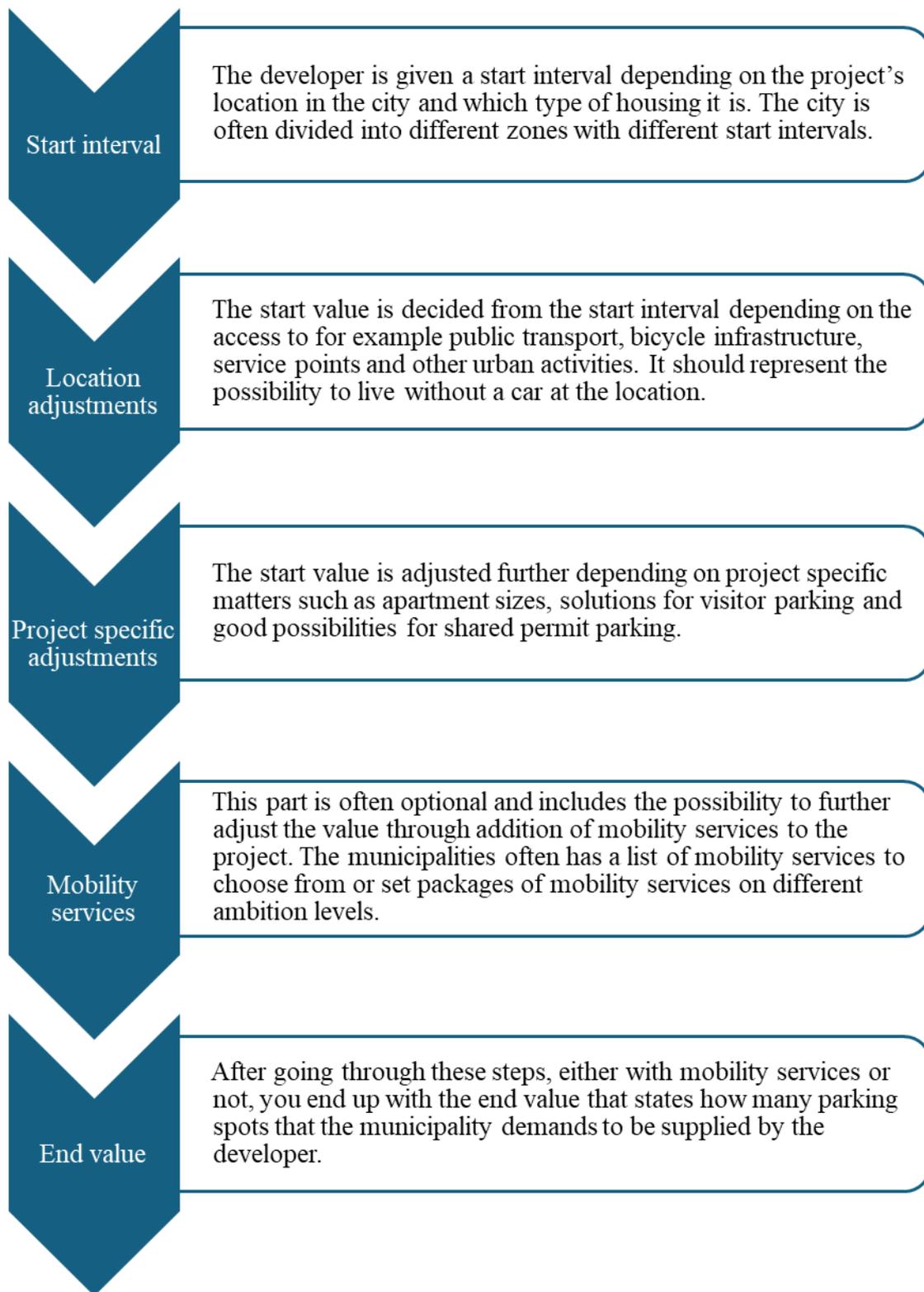
When the city of Stockholm introduced their flexible parking requirements in 2015, the thought behind it was to reduce the demand for parking and to give the possibility to refrain from unnecessary car trips through the introduction of mobility services. The mobility expert A. Roth furthermore highlights that the use of flexible parking requirements makes it possible to reduce car ownership and usage, something essential to reach the sustainability goals as well as the city's own goals. The respondent from Genova lifts that even if the whole car fleet is running on sustainable energy sources, the cars still take up a lot of space in the urban area, they need both roads and parking spaces, and they are also driving fast and can hurt people around them. It is therefore of interest to decrease the number of cars in the city to create a liveable city as well. In response to this, A. Roth means that there is a need to put the parking number a little bit under what the current car ownership is in developments to affect car use and ownership. However, it is sensitive to talk about a reduction in car ownership, it is a controversial subject.



*Figure 5.4 Shows the percentage of the surveyed Swedish municipalities working with flexible parking requirements, showed in total and divided by SALAR categories. n = 70.*

The Swedish National Board of Housing, Building and Planning means that more and more municipalities are working with flexible parking requirements today instead of the static parking requirements that previously had been the standard (Boverket, 2022). The trend of using flexible parking requirements with mobility services is something that A. Roth is highlighting as well, even though he says that the development is moving slowly. This goes in line with the results from the survey saying that 67% of the responding municipalities reported that they have flexible parking requirements, as can be seen in Figure 5.4. Furthermore, from the same figure, it can be seen that the smaller the municipalities are, the lower the likelihood that they have flexible parking requirements. In category C6 there are only 40% that have flexible parking requirements compared to 94% and 100% in the categories B3 and A1. This goes in line with the fact that good public transport connections are needed when working with lower parking numbers and mobility services, as stated by both the consultant L-B. Ekman and the researcher F. Sprei.

Flexible parking requirements are based on the minimum parking requirements, meaning that you start and stop the process with a minimum parking number that the real estate developer must supply, but where the difference from the minimum parking requirements is that it is possible to adjust and decrease the parking number through different steps. Looking at the parking requirements from the cities of Stockholm, Gothenburg, and Malmö, it can be seen that they have a rather similar process with small differences and location specifications. This however does not come as a surprise since it can be seen from the interview study that municipalities are collaborating to some extent and are taking inspiration from each other. The general process of flexible parking requirements is presented in Figure 5.5.



*Figure 5.5 Shows the general procedure of working with flexible parking requirements.*

Even though the process for flexible parking requirements is rather similar between the studied municipalities does it differ between municipalities in which state of the planning process that things is being set. In the city of Malmö, it is up to the real estate developer to do a parking and mobility investigation in the detailed development plan process, but the design of the mobility services does not need to be described in detail until the building permit process (Malmö stad, 2020). Contrary to this, in the city of Gothenburg is the design of the mobility services set in the detailed development plan stage, however, are they open to changes in the building permit stage as long as they are not too big, and the same requirements are being fulfilled. In the city of Stockholm, the project-specific parking number, as well as the green parking number (mobility service based), is set in the land development agreement and detailed development plan process, similar to the city of Gothenburg (Stockholms stad, 2015). Generally, the parking numbers can be viewed as flexible until they are set. The mobility services are generally regulated through some type of agreement between the developer and the municipality connected to the planning process (Boverket, 2022). When a parking number is set, there is no flexibility, for instance, can a real estate owner not reduce their already set parking number by adding mobility services afterwards. If they want to change a parking number afterwards, it requires a new building permit, which no one in general applies for. The use of mobility services and the agreements connected to the planning process are further discussed in Chapters 5.4 and 5.4.4. What could be noted is that the city of Stockholm at the moment is in the process of revising their flexible parking requirements since the old one is too long, unspecified and outdated. What the new requirements will include is unsure and will be set by the municipal council, however, they want to generally have lower parking numbers with the possibility of having no parking in specific areas, as well as to have a high standard of mobility services from the beginning in all projects.

### **5.3.3 Maximum parking requirements**

The most common requirement in Sweden is as mentioned to use minimum parking requirements, using maximum requirements instead is unusual in Swedish municipalities today (Holm & Ivansson, 2022). Instead of requiring a minimum amount of required parking spots to be built, maximum requirements instead set a cap on the maximum number of parking spots allowed to be built (SOU 2021:23). The idea is that this will limit the amount of parking being built and lead to a more efficient use of land and thus create a more attractive cityscape. Outside of Sweden, these types of requirements have started to become more recommended, and more cities have started adopting them (Gies et al., 2021). A European city that has experience with working with maximum requirements is the city of London where they implemented it in 2004 (Gou, 2018). The implementation in London led to the provision of new parking spots in connection to new developments falling by roughly 40%. Gou (2018) however discusses that the drop in the addition of parking spots is due to the removal of the previous minimum parking requirement rather than the introduction of maximum requirements. Another example of a European city that has adopted maximum parking requirements is the city of Oslo (City of Oslo, 2022).

As mentioned, the maximum requirements are unusual in Sweden, however, the mobility expert A. Roth mentions that maximum requirements in theory are possible to implement in Sweden. The legal expert Å. Romson concurs with Roth's statement

that implementing maximum requirements in Sweden would be legally possible with today's legislation, she does however acknowledge that even though the legislation opens up for it, the legislation's formulation makes it difficult. The PBL makes it possible to set clear demands in the detailed development plan for how and if the property should be used for parking, leading to introducing maximum requirements connected to the detailed development plan being possible. However, would the municipality have to go over and change the demands in every detailed development plan, making the procedure both cumbersome and resource demanding. In Å. Romson's opinion is it hard to see maximum requirements become more common in Sweden without a change in the PBL to support it more actively.

### 5.3.4 Zero parking requirements

Regulating parking by not demanding parking at all and using zero parking requirements is also an option according to the mobility expert A. Roth. Such initiatives have been implemented in other parts of Europe such as in the city of Berlin (Gies et al., 2021). The decision not to demand any parking to be provided in new developments was set in place in 1997, and after evaluation in 2009 it was shown that adequate parking spaces were still constructed by developers. The number of parking spaces constructed depended on where in the city the development was built and the price level, parking was built to a larger extent in conjunction with higher-end developments, as parking spots can be viewed as a selling point. A similar regulatory change has been made in Hamburg where no parking is required to be built in conjunction with the new development of housing. The previous minimums required 0,8 spaces per residence or 0,6 spaces in multistorey residential buildings in central areas to be built. After the removal of the requirements the parking spaces per residence built fell to 0.52 in central areas and 0,57 in the remainder of the city. Similar decisions of removing demands of building parking in conjunction with new developments have been taken in some American cities as well, such as in Buffalo in 2017, Austin in 2023 as well as in Minneapolis, Portland, and San José (Hess & Rehler, 2021)(Fechter, 2023).

Implementing zero parking requirements and not demanding developers to build any parking is possible in Sweden with today's legislation (Romson et al., 2020). If the municipality considers there is no demand for parking to be built when considering the surrounding circumstances and concerning what is stated in the PBL can the municipalities allow for new developments with no parking being supplied. Furthermore, must the municipalities guarantee that all real estate developers are being treated according to the principle of equality and that the project is taking into consideration neighbouring properties and that their interests are being considered. The mobility expert A. Roth refers to American examples as well, showing that there have been some positive effects from doing this, that zero parking requirements have led to less parking being built and that the developers have reported that they can think smarter regarding how they are managing parking. A city in Sweden that has zero parking requirements is Trelleborg. In 2020 the municipality of Trelleborg realised that their parking requirements did not correspond with their goal of densifying the city in their deepened comprehensive plan. This led them to implement zero parking requirements with the reasoning being that this would encourage construction and densification in the city without building parking spots at unwanted locations such as on courtyards. The respondent from Trelleborg means that the

benefit of zero parking requirements is that it gives freedom to developers to decide if they find it necessary to supply and build parking spots without it being a municipal demand, thus encouraging the construction of housing. Furthermore, is this type of regulation in line with the city wanting to work towards a more sustainable transport system, as it reduces the constraints of planning for the car.

A downside that the respondent from the municipality of Trelleborg means that the city has seen with zero parking requirements is that it is hard for them as a municipality to predict how much parking is going to be built as opposed to when working with minimum parking requirements. Another downside mentioned is that the requirements make it challenging to use parking purchase as a financing model as there are no incentives to construct shared parking facilities. The municipality of Trelleborg has not done any thorough evaluation of how their requirements have functioned and if construction has increased, the respondent does however see that an in-depth evaluation would be valuable as they are rather unique in Sweden with their requirements and it would be valuable to be able to point towards real examples of what works, rather than what people think are working, which there is a tendency of doing today. Such an evaluation is planned to be conducted by the municipality of Trelleborg in the near future. Something the municipality of Trelleborg would have done differently if the requirements were introduced all over again is to establish the requirements deeper in the municipality's organisation as a whole at the different municipal offices, as different offices have different responsibilities regarding issues related to parking in new developments.

To summarise can it be said there are possibilities, as in the case of Trelleborg, to work with zero parking requirements in Sweden with the current legislation. Furthermore, there are some international examples showing the benefits of using them, however, more research is needed to evaluate its function in the Swedish context.

## **5.4 The sustainable solutions used today**

Today, many municipalities have sustainability goals and there is a willingness in the municipalities to find more sustainable solutions in all sectors, parking and mobility are no exception. If for example looking at the city of Gothenburg, they see themselves as being rather leading and innovative in matters regarding parking and mobility, and they want to direct the parking situation and use parking regulation to move towards a more sustainable transport system in the city. They want to have large flexibility for developers to find sustainable solutions. On the same note, the city of Malmö wants to reduce car parking and focus more on packaging mobility moving forward. More focus is to be put on offering alternative mobility solutions to the inhabitants in connection to the city's goals regarding sustainability and the more overarching goals and plans regarding the city's development. The respondent from the city of Gothenburg furthermore means that it is easier to work with people's travelling behaviour in new development areas, but that the hardest and most interesting part is to work with people's travelling behaviour connected to the already built environment. This is also where most of the travelling takes place. There is a need to work more actively on how they are affecting what has already been built and to zoom out to reach the city's sustainability goals. In this chapter will different alternative ways of supplying parking and mobility be presented, as can be seen in

Figure 5.6. To make it easily overlooked, they have been divided into two categories, shared parking solutions and mobility solutions. The shared parking solutions have further been divided into the categories of parking purchase, solutions connected to real estate law and commonly owned facilities, while the mobility solutions have been divided into mobility services and mobility purchases. Before going into detail on these categories, the use of a neighbourhood perspective on parking and shared parking facilities is described more generally.

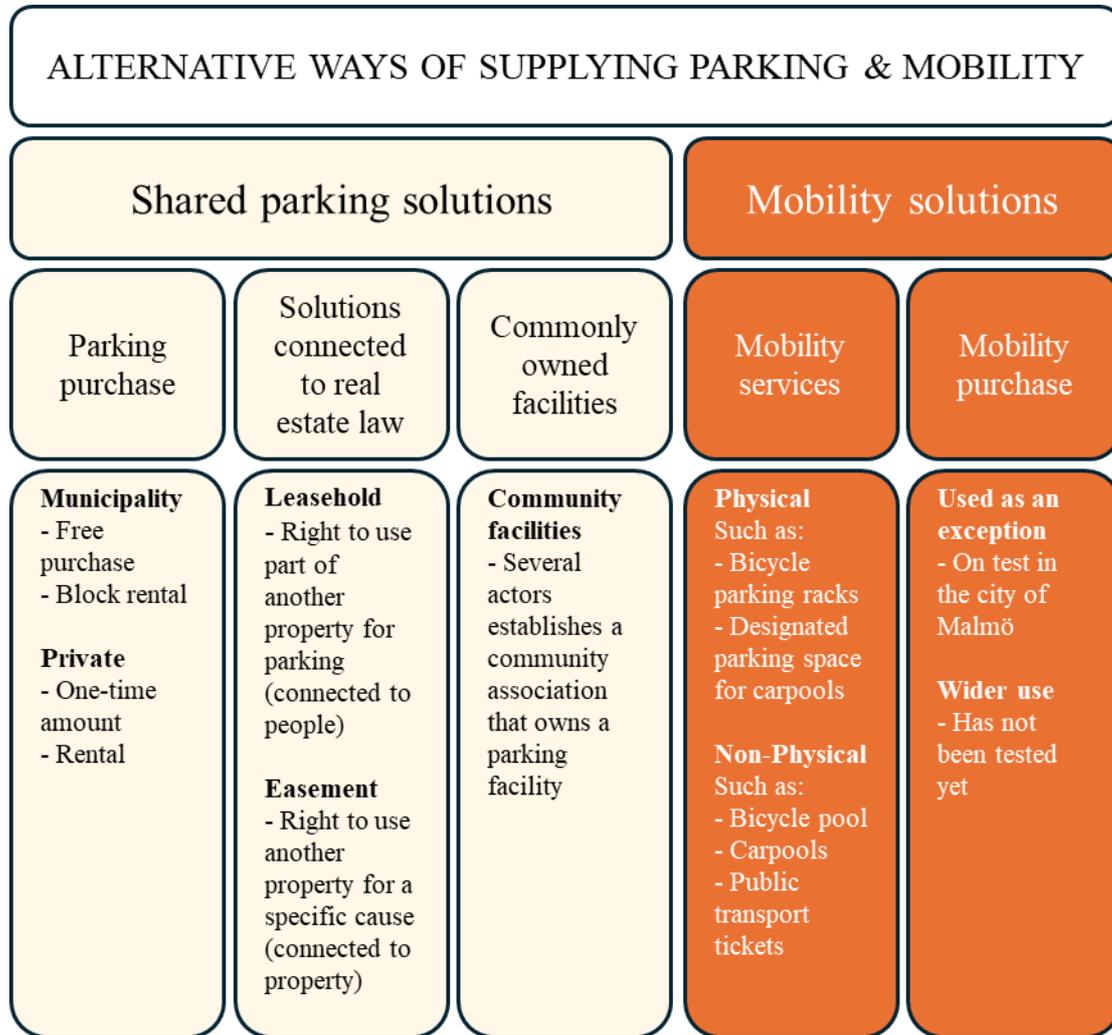


Figure 5.6 Shows alternative ways of supplying parking and mobility divided into two main categories, as well as in subcategories.

As mentioned, in Chapter 5.3, the classic way of interpreting the laws and legislations has been to demand that the parking of cars should be supplied within the respective property. Even though this is still the interpretation in some municipalities, it can be seen from the interviews and the survey that the use of alternative ways of supplying parking is becoming more and more common, especially in municipalities with larger cities and urban areas. Many of these solutions are however not new, but rather that they have become more highlighted and used recently. A common thing between the different solutions for shared parking is that they are used to satisfy the required municipal demand for parking on other properties than the one being built upon. It is up to each municipality to regulate which of these shared parking solutions they are

approving. It is therefore important to look at the parking requirements in the municipality where the development is taking place.

Even though the way of supplying the parking differs, is the municipal process connected to the detailed development plan and the building permit rather similar. In the city of Gothenburg are they talking about shared parking facilities and parking purchases with the developers already during the detailed development plan process. If the developer is interested, then they must declare for which part of the parking demand it counts, as well as how and where it will be provided instead of on their property. In the future, however, do the respondent from the city of Gothenburg mean that they instead want to have shared parking facilities and parking purchases as the starting point and instead make the developers declare why they do not intend to use it, making it a more natural part of the parking discussion. The first step of action for developers should be to look at neighbouring properties to see if there is any available parking capacity there, before considering building a parking facility. The respondent from the city of Stockholm means that Stockholm is also planning to include it in their new parking requirements that are being developed now, that you always need to look over whether you can gather parking in shared facilities or not. The respondent from Genova furthermore states that the municipalities to a greater extent should require that developers get together to increase the collaboration between developers regarding parking, but after that leave the solution to the developers and let the market decide. The respondents from ByggVesta furthermore state that the best way to provide parking to fulfil the parking requirement, from a climate perspective, is to use parking purchase or similar in an already built parking facility with vacant parking spaces. This is something that the respondent from the city of Gothenburg agrees with, wanting the developers to firstly utilise existing parking capacity and secondly new shared parking facilities. But there are not only upsides to working with parking in the early stages of the planning process. Both the respondents from Bonava and ByggVesta see that the demand to sign a parking purchase already in the detailed development plan process could be problematic since it makes you decide and sign agreements perhaps 5-7 years before the house is being built. At that time, the demand for parking might have changed, leading to them signing up and paying for too many parking spots.

According to the legal expert Å. Romson, when a building is finished, and the final inspection has been done, then is the development process done from the municipality's side. The municipality then has the responsibility for monitoring that the real estate owner, regardless of them being private or public, can uphold the functional demands of the property, which sufficient parking spots are a part of. If the demand for parking suddenly becomes largely increased, the municipality then has the right, according to the PBL 8 Ch. 10 §, to demand that the real estate owner must supply additional parking to satisfy the increased demand. Å. Romson however says that this is difficult in practice, as the municipality cannot demand this if it becomes very economically demanding for the real estate owner and so on. Because of this is it in the real estate owners' interest to write lengthy agreements to show that the parking demand is satisfied for the foreseeable future.

From the interviews, it can be seen that working with more of a neighbourhood perspective on parking is quite straightforward in new development areas, but harder in the already built environment, which most of the city and buildings are. Today the

city of Malmö is working with more of a neighbourhood perspective and in new larger development plans the main way of solving parking and mobility is by planning for shared parking in mobility houses where the real estate developers are buying in on the facilities through parking purchases to fulfil their parking demand. This is something that they have been working with for about ten years. When doing these new development plans, the city has since about five years ago, also ruled out the possibility for developers to by themselves build surface parking and underground parking garages. A similar way of working is also common in new larger development plans both in the city of Stockholm and Gothenburg. The fact that municipalities are demanding cooperation between actors regarding parking already in the planning program in larger development areas is something that the respondents from Framtiden byggutveckling are positive to. Several other respondents such as Wallenstam and Genova are also lifting the high potential for cooperation and sharing in new development areas. The respondents from Framtiden byggutveckling furthermore state that cooperation is needed between new development and the already built environment regarding parking while densifying an area, using a neighbourhood perspective becomes important. This is something that respondents from both Balder and Genova agree upon as important. The respondents from Bonava also lifted that it is possible to have some parking spots on their own property and some in a shared facility.

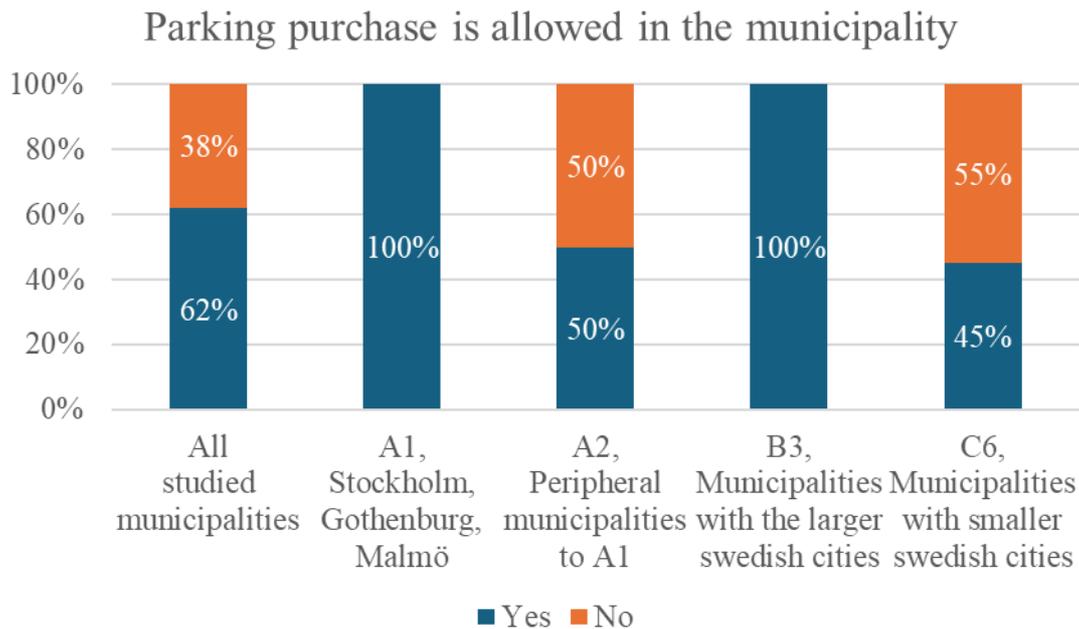
The reason why the city of Malmö is ruling out underground parking garages to be built in the city is according to the respondent that it is counteracting other desired qualities in the courtyards, for example planting trees. This is something that the respondent from the city of Stockholm agrees with, however, they are still promoting the use of underground parking garages since they have a problem with finding enough accessible land to build parking houses or other above-ground facilities on. As with everything is there both upsides and downsides with both underground garages and above-ground parking facilities. Upsides that have been found regarding parking houses are that they are more space efficient than surface parking and that they have a cheaper construction cost than underground parking garages (SKR, 2021). The mobility expert A. Roth furthermore states that a benefit of using underground parking garages is that it is more space efficient than surface parking. However, does the use of underground parking garages make it difficult to share the facility since safety concerns are arising. This is something that the respondents from both Stena fastigheter and Bonava are lifting as well, meaning that it is a safety risk to let third-party persons into the garage and thereby within the outer shell of the house. A. Roth furthermore states that he is not for the banishment of building garages, as the city of Malmö has done, but he acknowledges that the sharing possibilities of above-ground parking facilities are greater, as well as them being easier to convert to suit other types of activities in the future. He concludes by saying that there are more benefits to not building garages than building them. The fact that times can change and that it thereby is better to build parking facilities above ground rather than underground garages since they are easier to convert to other uses if the situation is changing is something that the respondent from Balder is lifting as well. There are however some safety concerns with shared parking facilities, regardless of whether they are above or beneath the ground. Both the respondents from Stena fastigheter and Riksbyggen are lifting that shared parking houses often can be experienced as an unsafe environment, especially when it is dark outside. It does not matter if it is safe or not, it is the perceived feeling that matters. It becomes a trade-off between the environmental

benefits and the safety concerns. It is therefore important to design the parking facilities so that they are experienced as safer, for example by adding good lighting, using open and transparent construction, or using clear signage (SKR, 2021). According to the respondent from Genova, you can also work with digital tools to regulate and map who is going in or out of the facility.

The benefits of using a neighbourhood perspective and solving parking in shared parking facilities are according to the consultant L-B. Ekman, that it is an effective way of using space. Furthermore, multiple real estate developers have stated that shared parking facilities are a price and space-efficient solution. This is something that the mobility expert A. Roth agrees with, and he states that parking purchases are beneficial since they enable parking not to be built in each respective property, leading to space being used more efficiently in shared parking facilities, as well as it is making it less attractive to own a car. The researcher F. Sprei talks in the same way and states that being a longer distance from housing to parking should change how people are using their cars. To make it less attractive and convenient to use the car, Å. Romson states that the parking should be located further away than the access to public transport, bicycles, or other mobility services. Similarly, the consultant P. Bergström Jonsson highlights this as an advantage of shared parking, making other modes of transport more competitive. This could however according to the respondent from Stena fastigheter create dissatisfaction and anger at the residents, especially if they are used to having their own parking space nearby. L-B. Ekman however states that residents moving into new developments with shared parking facilities know what they are moving to, and thereby have nothing to complain about.

### **5.4.1 Parking purchase**

The term parking purchase is not new, and it has been used in some Swedish municipalities since the late 1950s (SOU 1989:23). According to the legal expert Å. Romson, a parking purchase agreement can be used to legally show that the demand for parking is being satisfied in another location outside of the property in question in a detailed development plan or a building permit process. From the survey, it can be seen that 62% of the responding municipalities are allowing parking purchases in some way, as can be seen in Figure 5.7. Furthermore, it can be seen that the cities of Stockholm, Gothenburg and Malmö, as well as all the municipalities with large cities, allow it, while the peripheral municipalities and the municipalities with smaller cities are more divided with around half of them allowing it. This highlights the fact that parking purchases at the moment might be more used in larger cities. What this depends on is difficult to say exactly, but what can be said is that it works better in more urban areas. Parking is an urban planning issue; you cannot look at parking isolated. The respondent from Genova highlights the fact that if you are going to decrease the demand for parking, then it is needed that people have access to things such as public transport, kindergarten and stores in their immediate area, the mixed city. The everyday life must be easy to manage.

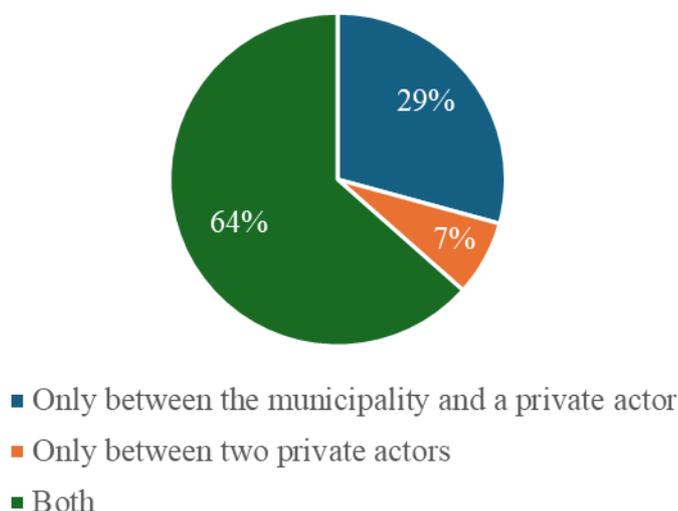


*Figure 5.7 Shows the percentage of the surveyed Swedish municipalities where parking purchase is allowed, showed in total and divided by SALAR categories. n = 71.*

Parking purchase is a wide term that includes different types of agreements. In our interpretation are there two main categories, municipally driven parking purchases and privately driven parking purchases. Under municipally driven parking purchase, there are two types of agreements that are used; it is “Free purchase”, in Swedish called “Friköp”, and “Block rental”, in Swedish called “Avlösen”. Similar types of agreements are used in the case of private parties, even though they in Swedish are not called the same thing. It is therefore in this thesis called “One-time amount” and “Rental”. If looking at how the interviewed municipalities are working, can it be seen that the city of Malmö is giving the real estate developers the alternative to arrange the parking demand outside of their property, either through usufruct agreements with another real estate owner or by making an agreement with the municipality regarding parking purchase. The city of Gothenburg has a similar setup, with municipal parking purchases driven by Göteborgs Parkerings AB, but they cannot demand that a private developer can only do parking purchases from the municipality, instead, they also can buy parking spots from another private part as well, as long as they can show the city that the agreement stretches for 25 years. In the city of Stockholm, they have a similar setup as the other two with the municipal parking company Stockholms Stads Parkerings AB in charge of the parking purchases. In the city of Trelleborg, they are working with municipal parking purchases, as well as letting private real estate owners make agreements themselves, however, since they introduced the zero-parking requirement there have not been any parking purchases even though they want to use it more. In other words, can it be said that all interviewed municipalities are allowing both municipal and private parking purchase agreements. Looking at Figure 5.8 however, can it be seen that it is not the case for all municipalities that are allowing parking purchases. Even though 64% of the municipalities that are allowing parking purchases are allowing both types, there are still 29% that are only allowing municipally driven parking purchases, and 7% who are only allowing privately driven

parking purchases. This highlights the need for real estate developers to read up on the parking requirements in the respective municipality that they are working within in a project.

### Parking purchase is allowed between these actors



*Figure 5.8 Shows the percentage of the surveyed Swedish municipalities between which actors parking purchase is allowed. n = 41.*

As mentioned earlier are there two types of municipally driven parking purchases, free purchase and block rental. Free purchase can according to (SOU 1989:23), be described as when a property owner pays a lump sum per parking space to the municipality, who then takes the responsibility to build parking spaces in a shared parking facility. The buying property often has priority in the renting process of the parking spaces; however, they do not have an obligation to rent any parking spaces in the parking facility. It does however sometimes happen that there is no construction of a parking facility even though the property owner has paid for the parking purchase. In the city of Malmö, the funds from the free purchase are saved for the building of future parking facilities if the free purchase is connected to an already-built parking facility. Similarly, in Umeå is the municipal parking company Upab responsible for the parking purchase, and they are building parking facilities when there is a need, until then is the funding saved (Umeå kommun, 2013). Furthermore, it can be seen that for many municipalities, the purpose of using free purchases is to enable future investments in shared parking facilities, often parking houses (SKR, 2021). If the property owner or its residents decide to rent parking spaces, then it can be seen from the interviews that they have to pay a monthly parking fee, like the usual parking fee in the city. It is also common that permit parking is used in shared parking facilities, meaning that the person renting a parking spot does not get their own dedicated parking spot. Furthermore, (SOU 1989:23) describes block rental as when a property owner undertakes to for a certain number of years pay a rent that corresponds to the parking facility's annual costs, reduced by the annual income. The block rental agreement is often spanning over at least 25 years (Ramboll, 2022). Regarding the privately driven parking purchases it can be seen from the interviews that they are set up similarly, either by paying a one-time amount to finance the construction of a

parking facility or by signing up to rent a couple of parking spaces for a set number of years.

How long a parking purchase generally is, regardless of the type, can be seen from both the survey and the interviews in this thesis, highlighting that parking purchase agreements usually span over 25 years. It is seen as the standard, even though some municipalities are working differently. For example, it can be seen that the Kalmar municipality is using 15 years, Sundsvall 20 years and Lidköping 10+5 years, as well as a few municipalities saying that it is agreed upon in every project alone. What happens after the agreement runs out after 25 years is somewhat unclear and it is something that for example the city of Malmö is investigating at the moment. The respondent means that they are unsure if it can be viewed as the debt has been paid after 25 years or if the agreement needs to be renewed. In the city of Gothenburg, however, are they demanding that there should be a possibility to extend the contract, but they are at the same time saying that there is no control after the 25 years. The only demand the real estate owner has is to continue to satisfy the property's need for parking, and then it is up to them to decide if it is in line with the previous parking purchase agreement and parking number. According to the legal expert Å. Romson is there not a must to sign a new agreement when it expires, if the residents still can rent and get access to the parking facility; meaning that it is not the agreement that is required, it is the effect of the agreement that is important, that the parking demand is satisfied.

Regarding the price of free purchase parking purchases, it can be seen from the survey and the interviews, that the price, as well as the setup, varies a lot between municipalities. Some municipalities such as the city of Stockholm, Gothenburg, Lund and Örebro, do not have any fixed price and the price of the parking purchase varies between each project. Another setup can be seen in for example Helsingborg and Borås where they have fixed prices based on price base amounts (57 300 SEK each in 2024), but where the amount of price base amounts differs depending on where in the city it is. For example, Helsingborg has 4 price base amounts (229 200 SEK in 2024) in the city centre and 3 price base amounts (171 900 SEK in 2024) outside of the city centre. The third type of price setup is a fixed price, which can be set up either by a fixed sum or by a fixed sum of price base amounts. For example, do the cities of Malmö, Umeå, Halmstad and Kungsbacka have a fixed sum, while Sollentuna, Trelleborg and Sundsvall have a fixed sum of price base amounts. A price base amount is recalculated almost every year and has the purpose of adjusting to the change in the consumer price index (Statistics Sweden, 2023). For the same reason, the fixed sum sometimes has an index enumeration. The price of parking that is stated by the municipalities only applies to municipally driven parking purchases, however, they can be used as guidance for privately driven parking purchases as well. In addition to the parking purchase price, the end user of the parking facility must most often pay a fee for using it.

As already said, the city of Gothenburg does not have a fixed price on parking purchase, instead, the price that the developer must pay varies between projects and depends on the type of parking facility it is, if it is a current facility or if it is a new one and what the construction cost is etcetera. The respondent from the city of Gothenburg does however see the benefits in having a fixed price like the city of Malmö does, since this would create more clarity for the developers of what it costs

beforehand. The respondent from the city of Malmö furthermore states that the benefits of using parking purchase are that it gives the municipal parking company incentives to build shared parking facilities as it gives them the economic means and opportunity to build the parking facilities when the rest of a new development area is not finished. The thought behind their fixed price however is not to cover the whole construction cost, but rather function as initial capital to get the municipal parking company started and then that the monthly fee should cover the remaining investment. Similarly, in Lund does the parking purchase price vary between projects, however when the municipal parking company LKPAB is involved, then is the idea that roughly two-thirds of the building cost of the parking facility should be financed by the parking purchase price, the last third should then be financed by the parking fees that the users of the facility are paying (Lunds kommun, 2021). Furthermore, in Umeå do they have a fixed price where the thought is that the parking purchase price should cover 50% of the building cost and that the other 50% should be covered by the parking fees from the users of the facilities. From the survey, a mean value of the parking purchase prices has been calculated based on the highest price from each respective municipality presented in Figure 5.9, resulting in a mean price of 232 557 SEK.

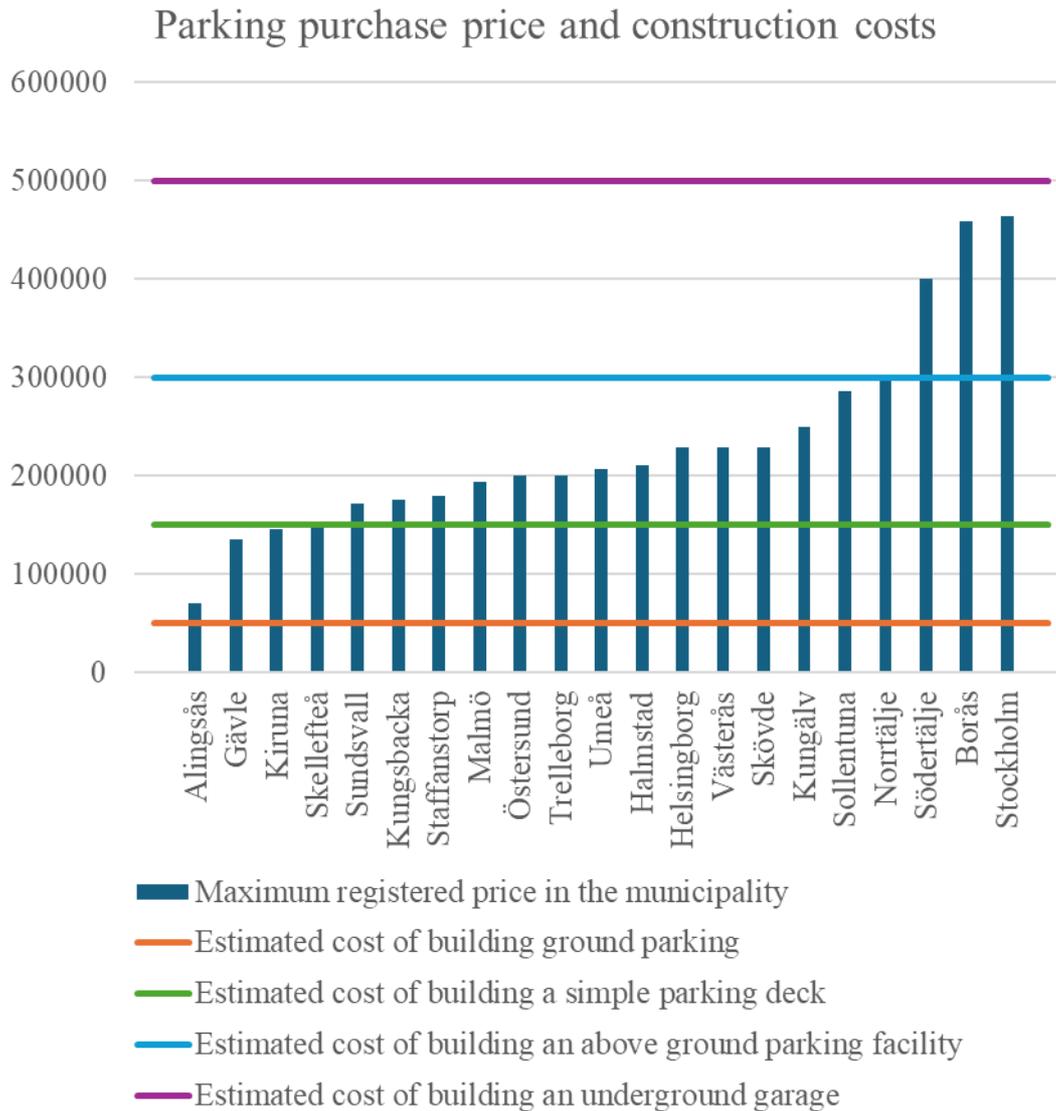


Figure 5.9 Shows the highest parking purchase price reported by the surveyed Swedish municipalities, as well as showing the estimated construction cost of different parking facilities.  $n = 21$ .

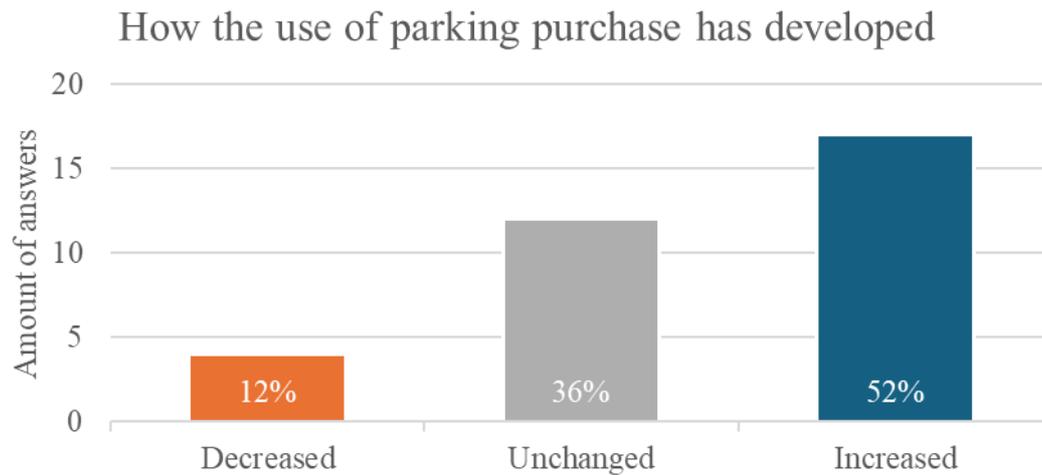
In Figure 5.9, a comparison between the municipal parking purchase price and the estimated building cost of different types of parking facilities is shown. The estimated costs used in the graphs are taken from the analysis of building costs in Chapter 5.2. Generally, the highest number in a cost interval is used. From the figure, it can be seen that the price of parking purchases often only covers the construction cost of a simple parking deck. A few municipalities are covering the cost of an above-ground parking facility, however, none of the municipalities are covering the cost of building a parking garage. If the fact that some municipalities only plan that the parking purchase price should cover a part of the building cost is taken into consideration, then could the total sum cover more types of parking facilities. If looking at the example of Umeå, their parking price is meant to cover 50% of the building cost, meaning that their idea is that it in total should be able to cover the building cost of a facility at 413 000 SEK per parking spot, which means that it covers an above-ground parking facility. What could be said however is that it is a theoretical model that is

challenged by the rising building costs. Similarly in the city of Malmö, they are discussing that the parking purchase price still is at a low level, even though it was adjusted last year. It will most likely be increased further, but it depends on how the economy evolves.

An example of the use of municipal free purchase can be seen in the city of Gothenburg. In the large new development plan Masthuggskajen, they are working with a green transport plan and the city has demanded that all the parking, required for housing, offices, guests, and other activities should be co-located in three shared parking facilities in the area. In Masthuggskajen, there is a consortium that is planning everything together with the leading by the municipally owned development company Älvstranden byggutveckling. The background to this setup and the reason behind the use of shared parking facilities comes according to the consultant L-B. Ekman from the transport department at the municipality which is then realised by Älvstranden byggutveckling. It is the municipally owned parking company, Göteborgs Parkering AB that owns and builds the parking facilities. Two of them will be built, one underground garage and one parking house, and one parking house is existing from the prior use of the area. The municipal free purchase agreement spans over 25 years, and the cost was 310 000 SEK per parking spot. The parking purchases give each property access to the parking facilities where permit parking is used, meaning that the residents get access to the number of parking spots they are paying for based on the municipal parking number but that they get to park in any of the parking facilities in the area, meaning that they do not have their own parking spot. In addition to the demand to satisfy the parking demand through parking purchases, the real estate developers have an opportunity to place up to 15 parking spaces dedicated to carpools on their property.

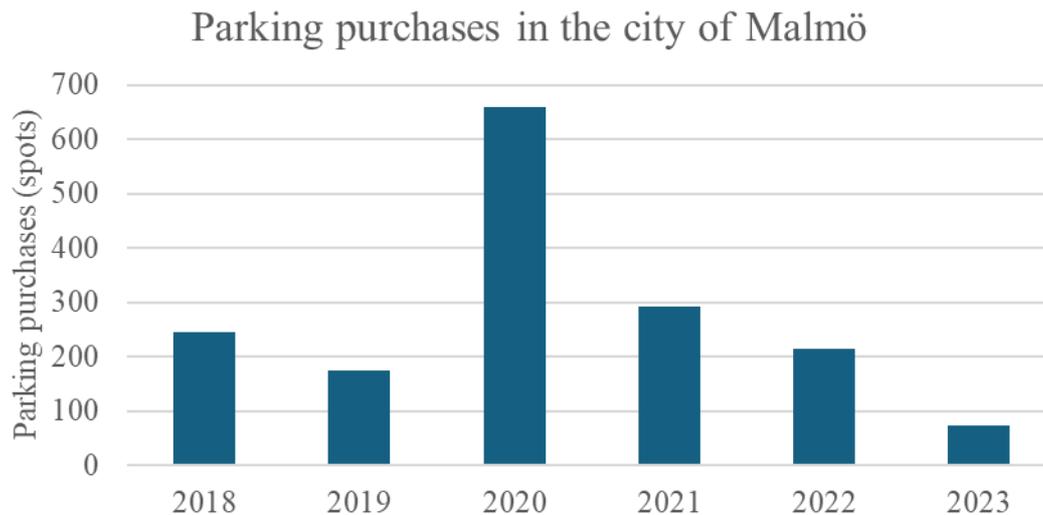
The reason behind Göteborgs Parkering AB owning the parking facilities in Masthuggskajen is according to the consultant L-B. Ekman a mix of that the municipality at the moment of the decision was assured that it was a good idea and that private actors are satisfied with not having to take the responsibility. He furthermore argues that it might not be the best solution that it is the municipality that owns the facilities in the long term since they then need to tie up a lot of capital in facilities that might not be needed in the long term. Maybe it would have been better with a mix of private and municipal facilities. The respondent from the city of Stockholm on the other hand says that they have more resourcefulness over the facility if it is the municipality that is building and managing the facility.

Regarding how common parking purchases are, it can be seen from the survey that when the municipalities that are allowing parking purchases were asked about how the trend for parking purchases is looking, 52% of the respondents answered that the use of parking purchases is increasing, as can be seen in Figure 5.10. Furthermore, 36% answered that the use is unchanged followed by 12% saying that it is decreasing. The takeaway from this is that the use of parking purchases generally is increasing, but there are some places where it decreases. What could be said however is that the municipalities where it is decreasing are of the smaller kind.



*Figure 5.10 Shows the trend of the usage of parking purchase reported by the surveyed Swedish municipalities. n = 37.*

It is difficult to get exact numbers on how many parking purchases have been done over time in the municipalities. Many municipalities do not have easy access to the information or do not have the information at all. The city of Gothenburg is one of the municipalities that finds it hard to answer how common parking purchases are, the respondent from the city of Gothenburg does however state that it is not uncommon, even though it does not occur in every project either. It is however more common in the central parts of the city where land prices are higher, as opposed to further out in the city where land is cheaper, and where it is more common to build one- and two-family homes. Similarly in the city of Stockholm, they do not have the information gathered for easy access, but the respondent does refer to the municipal parking company Stockholm Parkering saying that it has increased significantly. The city of Malmö nevertheless has better knowledge regarding how many parking purchases are done in the municipality. As can be seen in Figure 5.11, the amount of parking purchases varies, but over the six years studied here, the mean value is 277 parking spots per year. Furthermore, does the respondent from the city of Malmö state that parking purchases is more common in the city’s larger new development plans, while the use in so-called “fill-in plans” in the already built city is more varied. If comparing the mean value in Malmö with other estimated numbers from the survey, it can be seen that municipalities like Västerås, Karlstad and Kalmar estimate the parking purchase use to approximately 76-150 parking spots annually, while municipalities like Umeå, Borås, Sollentuna and Sundbyberg approximately have between 26-60 parking spots per year. Smaller municipalities and the smaller peripheral municipalities generally do not have more than 25 parking spots per year that are supplied through parking purchases.



*Figure 5.11 Shows the number of parking purchases in parking spots per year reported by the city of Malmö.*

Regarding the interviewed real estate developers, it can be seen that the use of parking purchases differs a lot. The respondents from ByggVesta state that they are looking over the possibility of parking purchase in all projects, but that it is used in roughly half of them. In some cases, are they able to use parking purchases to satisfy some of the demand and supply the rest of the demand on the property. In some cases, have parking purchases also been the dealbreaker to be able to proceed and finish projects. Furthermore, the use of shared parking facilities and parking purchases are more common in larger development areas than in independent densifying projects, and it could be a set requirement from the municipality that they have to plan around. The respondents from Bonava also state that parking purchase is a rather common thing to use, but that it is not something that is used in all projects. The respondent from Riksbyggen states that they are rather new in the parking purchase market and have yet only one contract that has run for only a year. Stena fastigheter does not have parking purchase as an overall strategy but is using it when the conditions for it are good. They have also used shared parking facilities between different properties within the company, which could be stated as some sort of parking purchase. Similarly has Bostadsbolaget not used parking purchases to a large extent yet, they have however used parking spots from other companies in the same municipal corporate group. In these cases, they have not needed to use parking purchase and no money has been transferred. They have also sold parking spots through parking purchase a few times to small condominiums and they are generally open to a wider use of it moving forward. Wallenstam has also shared parking between properties within the company and has sold parking spots a few times through parking purchases. Lastly, Genova has used it a few times and is open to using it more in the future when the setting is right. In summary, can it be said that the impression from the interviews was that parking purchase is something that historically has not been used as much, but it is something that the real estate developers are talking more about, and they are generally open to using it more.

## 5.4.2 Parking solutions connected to real estate law

There are two types of parking purchase solutions connected to real estate law, leasehold and easement. Both solutions can be applied in a variety of circumstances for giving the right for one property to use another property for a specific purpose. A difference between the two is that easement is connected to a specific property, while leasehold generally is connected to a specific person. Both solutions can however be used for the parking of cars on another property. What leasehold and easement entail and how they can be used for supplying parking is described further below.

### Leasehold

According to the 8 Ch. 1 § in the *Land code* (SFS 1970:994), leasehold is defined as:

*“Concession of land for use against remuneration can according to the regulations in this and chapter 9-11 occur as agricultural lease, resident lease, construction lease or ground lease in general.*

*Ground lease in general exists when land is concessioned on leasehold for other purpose than agriculture and the concession is not to be viewed as resident lease or construction lease.”*

A leasehold regarding parking spots is considered to be a ground lease in general (Sveriges Domstolar, 2023a). When a leasehold between parties is entered must the parties enter an agreement of land, the leaseholder has the right to use the land, the leaseholder must compensate the landowner for the concession, the leaseholder has sole procession of the land (Sveriges Domstolar, 2023b). Regarding a ground lease in general is both written and verbal agreements accepted. The agreements can be written with a decided duration, until further notice or on lifetime. Agreements are however not binding for more than 50 years, and more than 25 years if the land is included in a detailed development plan. Leaseholds give a legal person the right to use the land, they can however be reported into the property register (Lantmäteriet, n.d.-d).

### Easement

According to the 14 Ch. 1 § in the *Land code* (SFS 1970:994), easement is defined as:

*“If it is intended to promote a purposeful use of land, can in property (the servient property) right be granted to the owner of another property (the ruling property) to in certain respect or in another way claim the servient property or building or other facility belonging to this or to control the servient property in question regarding its usage in certain respect (easement)”*

An easement has no end date and is valid until something else is announced (Lantmäteriet, n.d.-c). The easement is linked to a specific property, not to a specific person which means that it is valid regardless of who owns the property. An easement can be formed either through a contractual easement, which is made through agreements between the respective property owners, or an official easement which is

formed, changed, or revoked through a surveying service (Lantmäteriet, n.d.-c). Some municipalities do not accept conceptual easement, for example, Lund, who is motivating it by expressing in their parking requirements that contractual agreements between two property owners do not give sufficient legitimacy since it can be changed or repealed without the municipality's approval (Lunds Kommun, 2018).

### 5.4.3 Community facilities

A community facility is a commonly owned facility that is owned and managed by several properties together (Lantmäteriet, n.d.-b). A community facility can be everything from for example individual roads, playgrounds, green areas, bridges and sewage systems to parking spaces or parking facilities. The community facility, in this case, a community parking facility, is reported in the property register and has its own register designation. Even three-dimensional properties can be created as community facilities. A community facility is set up, changed, or revoked in a surveying service. Each surveying service costs, and it varies depending on the time it takes to manage it. During the surveying service, it is decided how the percentage share of the facility is divided between the properties. The percentage decides how much each property must pay for the construction and maintenance of the facility, and the dividing of the percentages mainly depends on how much each property is expected to use the facility.

The management of the community facility can be managed in two ways, either by co-owner management or by creating a community association (Lantmäteriet, n.d.-b). In the co-owner-managed communities, the co-owners make joint decisions, which means that all co-owners must agree on all decisions that are made. If the co-owners do not agree, they can get help from Lantmäteriet who invites them to a co-owners meeting where the decision can be decided through voting. Lantmäteriet is taking out a fee for each of these meetings. In a community association, the decisions are instead decided through voting during the association meetings directly, meaning that all members of the associations do not have to agree with each other on all questions. A community association has a board that is responsible for the management of the facility and that ensures that the decisions made by the members are being implemented. The community association is its own legal person, and the members of the community association are the property owners that have a share in the association (Lantmäteriet, n.d.-a).

If a property connected to the community facility is being sold, or if there is a change in ownership through other reasons, the new property owners automatically become co-owners of the community facility (Lantmäteriet, n.d.-b). Participation in the community facility is linked to the ownership of each property and is therefore transferred automatically.

When building shared parking facilities, the packaging of ownership can, according to the respondent from Wallenstam, play a part in whether you must pay investment VAT or not. Furthermore, according to the respondent from Balder, placing the parking facility in a community association by creating a community facility makes it possible to not have to pay VAT on the investment and building cost of the parking facility, meaning a save of 25% on the building cost. Balder has used this setup in their new project Bohusgatan, where they created three separate condominium

associations to be able to create a community association for the parking facility. The parking facility was then placed in a separate 3D property that the community association owns as a community facility.

#### 5.4.4 Mobility services

As stated in Chapter 5.3.2 regarding flexible parking requirements can mobility services be used to lower the demand for parking spots and to build less parking. Mobility services can be both physical and non-physical measures taken to reduce the need for residents to own a car as well as giving incentives to travel using alternative modes of transport (Malmö stad, 2021). To get more out of each mobility service, they usually are bundled together, which gives a larger reduction in the parking numbers the more mobility services that are supplied connected to the flexible parking requirements. Physical mobility services are for instance dedicating space on the property for a carpool, a larger number of well-designed bicycle parking racks and shared permit parking, which will be further discussed in Chapter 5.7.2 (Boverket, 2022). Examples of non-physical mobility services are bicycle pools, carpools, delivery boxes, digital solutions such as public transport information and discounted public transport tickets. How the mobility services are connected to the parking number and how they are regulated by municipalities depends on the type of mobility service. Physical mobility services are regulated through the detailed development plan, and the physical space for the services is included and thus tied to the plan and the PBL (Romson et al., 2020). The non-physical mobility services cannot be governed by the detailed development plan and are usually regulated through civil law agreements written between the municipality and the developer. In these agreements, the developer guarantees to the municipality that the decided mobility services will be provided for an agreed-upon number of years.

According to the legal expert Å. Romson, the mobility agreements are included under civil law and most important is what the actors include in the contract, especially the points regarding what happens if one of the parties does not follow what has been stated and agreed upon in the agreement. The researcher F. Sprei says that mobility agreements usually are valid for 5-10 years. The mobility expert A. Roth furthermore describes that it is up to the respective municipality to decide for how long a mobility agreement should be valid and that most of them have landed in 10 years since this generally is viewed as a reasonable amount of long-sightedness.

The city of Gothenburg uses mobility agreements to regulate that the developer commits to offer the agreed-upon mobility services for 10 years from the completion of the development. After 10 years, it is optional to continue, but they are hoping that the real estate owners see a value in it and want to continue. If the real estate owner does not continue with the mobility services, there might be a degradation in accessibility, as the initial parking number partly was based on the addition of mobility services enabling better accessibility. The respondent from the city of Gothenburg means that legally the city probably cannot do anything, but they see that there might be some practical issues arising then. The city has the hope that the market for mobility services will be developed far enough in the coming years that other mobility services are being offered. They hope that their initiative gives the market some help on the way but are aware that it might be considered a bit of a gamble. In the city of Malmö however, how long the real estate owner needs to

uphold the mobility services is different for different types of services. Carpools and bicycle pools need to be there for 10 years per default. How long the other mobility services need to be there is different depending on what developers want to work with and what reduction in parking number it has led to. For example, does a bicycle service station need to be in place for 5 years. After the agreed-upon years for the respective mobility services is it optional to continue with the mobility services.

Both the researcher F. Sprei and the mobility expert A. Roth, are lifting the question about what happens when a property that has a mobility agreement connected to it is being sold to another owner or when a developer is handing it over to a condominium association. A. Roth explains that it is up to the municipality to make sure that it is stated in the agreement that the mobility services follow the property during the handover, how it is working in reality is a better question. How much do the municipalities want to spend to make sure that the agreements are followed and what are the sanction possibilities? It can be seen in the city of Malmö that the commitment to uphold the mobility services is transferred with the property to the next owner and that the seller has a responsibility to inform the buyer about the circumstances, however, can the respondent from the city of Malmö not say how this is working in practice exactly, it varies from case to case. F. Sprei means that this needs to be investigated more and highlights that it is extra interesting in the situation with condominiums since there might be a risk that developers are choosing to have a lot of mobility services to build less parking and get higher profits, while the condominiums then must manage expensive mobility services that they have not chosen themselves. The transfer between the developer and the condominium needs to be clear and the potential savings must be shared with the condominium as well.

How interested real estate companies are in mobility services and how often they supply them in projects differs a bit between companies, but they are overall rather interested. If starting at the municipality-owned real estate company Bostadsbolaget, the respondent sees that a majority of their tenants are already travelling sustainably and do not own a car, so it becomes skewed to assume that everyone requires a parking spot, which the company historically have done. If they consider this, it becomes easier to motivate a higher degree of investment in mobility services. In addition to this, Gothenburg cannot grow through urban sprawl, the city needs to be densified and it is therefore important that the space is used efficiently. Because of this, Bostadsbolaget are right now starting to implement their base offer of mobility services that over time will be implemented both in their new construction and in their existing building stock all over the city. They will for example have higher standards on their bicycle storage rooms, carpools within 400 meters from each building, bicycle pumps, pre-paid public transport, mail- and packaging boxes and mobility information days yearly. When instead looking at a private real estate company, in this case ByggVesta, the respondents see that parking is a central part of all projects and they are trying to reduce the parking numbers, partly since parking is costly and partly since they want to offer their tenants sustainable solutions. Nonetheless, do they feel that they generally are building more parking spaces than what is being used. Furthermore, looking at the company Bonava, they are doing mobility investigations in all projects, but whether they end up using mobility services or not depends on the project, but most often they end up supplying them. The respondents believe that it is possible to make people switch from using a private car to alternative mobility, however, it is then necessary that it is convenient and attractive to do so as well as at

the same time making it harder to own a car. The respondent from Stena fastigheter however sees that their usage of mobility services in projects is increasing and means that it is a way for the municipalities to incentivise them to build less parking. They are however feeling that the car use and the demand for parking is still strong and that mobility services are more of a “nice to have, not need to have” situation for most of the residents. This is something that the respondent from Genova agrees with, even though they mean that it can be a selling point argument in some cases. They are however working ambitiously with mobility services to lower the parking requirements and the parking number, so much so that it often results in them having queues to the parking spots that they are building. In summary, it can be said that flexible parking requirements and mobility services are used frequently for several different reasons, but it is still not used in all projects.

Whether or not mobility services are cheaper than building parking does depend on how you are calculating. The respondents from ByggVesta, state that it is a reoccurring calculation in all projects where you want to maximise the area of apartments, leading to a higher demand for parking spots or costly mobility services. You need to balance each number back and forth. However, it is generally cheaper to provide mobility services than building parking, even though it can vary from case to case. Mobility services are extra efficient if they can prevent building an extra floor in an underground garage. Furthermore, the respondent from Genova stated that the reason for them using as many mobility services as they do is that it is much cheaper and since they much rather spend money on mobility services than on parking, just “follow the money”. The respondent from Wallenstam agrees with this but adds that it generally is easier to use it in rental apartment projects than in condominiums since the residents in condominiums demand access to parking to a higher degree than in rentals, as well as it being easier to manage the mobility services in rental properties since the developer also has the responsibility of managing the property. Balder adds on a similar note that whether they are placing themselves on break even or under regarding mobility services versus parking spaces, differs from project to project and depends on which target group the project has, but they generally see that it is better to build mobility services than having empty parking spaces.

### **5.4.5 Mobility purchase**

The city of Malmö has in their latest Policy and requirements for mobility and parking, stated that they want to try a new method of handling parking and mobility called mobility purchase (Malmö stad, 2020). In situations when the real estate developer has done everything to decrease the parking demand by using mobility services, and still cannot supply the remaining parking demand either through supplying parking on the own property or through supplying parking on another property within a reasonable distance, for example by using parking purchase, then it is possible to use a mobility purchase. A mobility purchase is a contract between the property owner and the city of Malmö to set aside funds, corresponding to the parking purchase price, per parking spot that cannot be supplied in another way. The funds are then used by the city of Malmö for measures that improve sustainable mobility in the long term such as walking, cycling and public transport, as well as to decrease the parking demand. What is important however is that the use of the funds needs to be connected to the respective property’s mobility need and be demarcated from ordinary tax-funded measures. It is possible to use mobility purchase for up to 10% of the

parking demand or at the highest 10 parking spots. The system with mobility purchases is under evaluation in the first years and will be adjusted if needed. The respondent from the city of Stockholm states that they have been looking at a similar system and are discussing whether it is legal to use it. They see that the design of the system is important to say if it is a positive thing or not. The money must be spent on mobility services at the property and not on general measures such as bike lanes for example, otherwise, not all people are reached.

The legal expert Å. Romson states that it is positive that municipalities are testing and that they dare to be aggressive in finding solutions to planning for a more sustainable and car-friendly city. The use of mobility purchases is however in the grey area and there is a great risk that such a method is seen as a collection of money to finance various reforms in the municipality, such as should be tax-financed, then it becomes more of an illegal tax. Å. Romson is thereby overall doubtful about mobility purchases as a method.

A wider use of mobility purchases, where the property owners instead of being responsible for supplying mobility services themselves are paying the municipality to supply the mobility services is something that has been discussed as a future alternative solution. The researcher F. Sprei however means that it could be a bad idea and states that it raises some market economic questions regarding whether the municipality would have a monopoly in a system like this, as well as whether a system like it is legal in Sweden today. It raises further questions about whether the municipalities will provide the best services and if the municipalities should provide the services themselves or procure them. There could be some benefits with doing larger procurements, which is something that the mobility expert A. Roth is lifting as well, but F. Sprei is stating that the monopoly at the same time can prevent innovation due to a lack of competition. A. Roth means that a system like this might have some upsides in areas where there is a need to invest a lot to improve overall mobility access, for example, to introduce a carpool service in the city, but at places where there already are mobility actors, then it might not be as interesting. The respondent from the city of Malmö states that they today do not have a legal possibility to use mobility purchases to a wider extent, but they might be positive to it in the future if it becomes possible. In summary, can it be said that there is a need for more research into the effects of the mobility service system used today, as well as to look at how a future system might look like and what legal constraints there are.

## B. Future ways of managing parking and mobility

As described and discussed in this thesis, there is a need for a shift in mindset regarding the areas connected to parking and mobility in Sweden today. There have been opinions lifted that one of the root causes of the issues regarding parking is minimum parking requirements, for the parking market to function properly would it be suitable to let go of the minimum parking requirements and uncouple the demand of supplying parking from the construction of housing (D. Shoup, 2018; Svensson & Hedström, 2010; Hess & Rehler, 2021). At the same time, there is a large resistance to this happening in Sweden and stopping planning for the car completely might be too politically sensitive at the moment. A rather visualising quote from one of the interviews, coming from a respondent quoting a resident, showcasing the sensitive nature of the issues related to parking was, “Take my wife and my kids but whatever you do, do not [...] touch my parking spot!”. As further discussed, the legal frames in the PBL are rather centred around the fact that parking should be provided to satisfy the demand for parking in new developments. A complete U-turn in the national direction of parking policies, with removing demands for supplying parking altogether is in our collected view difficult and therefore not likely to happen in the near future, the system as a whole is too largely angled towards another direction for that to happen. With this notion as a base, the upcoming discussion and recommendations presented in Section B will focus on improving the existing system, situation, and legal frames rather than changing the entire playing field.

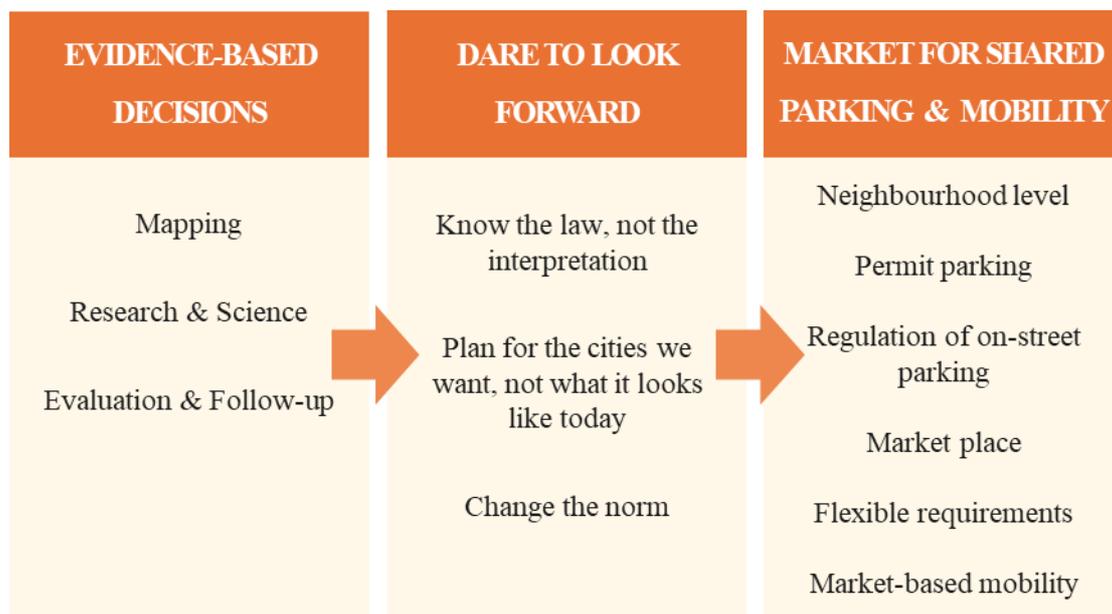


Figure 5.12 Shows the identified improvements presented in Section B of Chapter 5 Results and discussion.

As mentioned, it has been clear during this thesis that there is a need for improvements in the current way of managing parking and mobility. The identified improvement has been gathered in larger themes, presented in Figure 5.12. From the interview study and the survey, a common opinion that was raised from the municipalities was that it was hard to answer some questions since the topics covered in this thesis span different departments within the municipalities. A reflection of this is that the fact that it is different departments and different individuals that are holding

the knowledge and the power of decision-making, it becomes challenging to make comprehensive system-changing decisions. To manage more comprehensive system-changing decisions, it has been identified that there is a need for more knowledge sharing and more evidence-based decisions. If the knowledge is shared, not only between departments but also between all stakeholders, the decisions can be made based on evidence rather than on individual opinions and interpretations. Furthermore, since the topic of parking and mobility can be a rather sensitive matter, there is a need for decision-makers to dare more and to look forward to which city they want to have, instead of the city that they think they need to have. If evidence-based decisions are reached, it is much easier to dare to look forward since you can base it on what has been proven. When evidence-based decisions are reached and actors are daring to look forward, it is possible to create a market for shared parking and mobility. These topics will be discussed further in detail throughout this section.

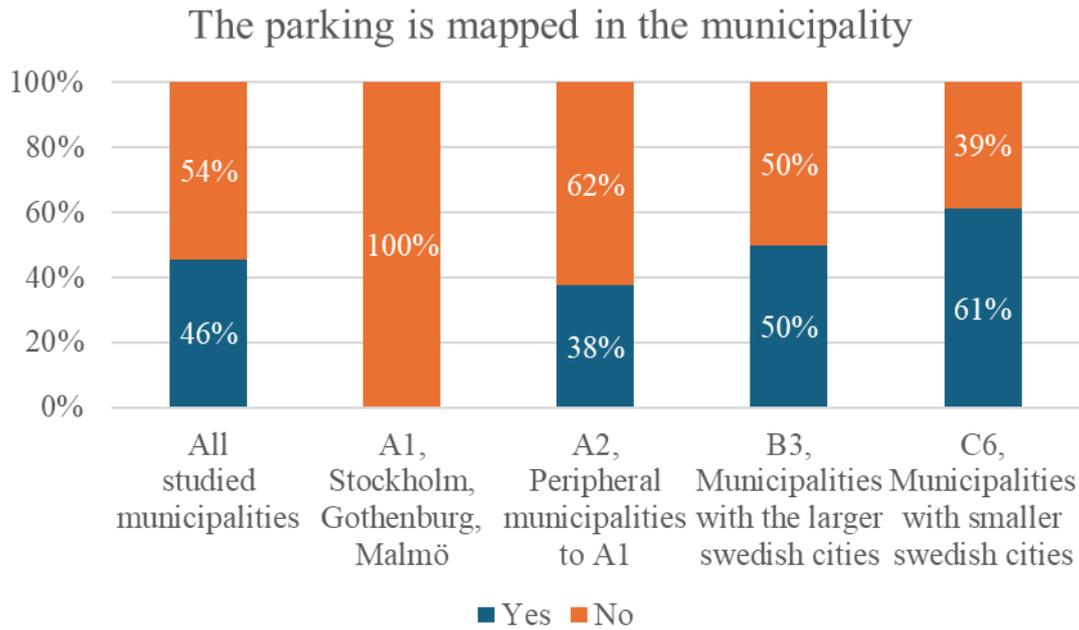
As described in Chapter 3, an interpretation of the middle-out framework is used throughout this thesis to analyse the different stakeholders' roles in enabling and sustaining the identified need for change, described in this section. At the end of each sub-chapter, a mapping of the key stakeholders in the respective change process, as well as in which directions they can promote change, is presented and discussed.

## **5.5 Evidence-based decisions**

As mentioned, a reflection from the parking management in Sweden is that there is a need for more knowledge and evidence. Decisions are often based on what one thinks works rather than what is proven to work or what is demanded. The mobility expert A. Roth is lifting the importance of creating more knowledge and evidence as one of the most important improvements going forward, especially to get better knowledge about the legal aspects as well as the effects of low parking numbers and different mobility services. To reach more evidence-based decisions, this thesis has identified three areas of improvement that require more focus in the future, as seen in Figure 5.12, these are mapping, research and science, and evaluation and follow-up. In this chapter, these will be discussed further in detail.

### **5.5.1 Mapping**

The mobility expert A. Roth states that having parking spots mapped significantly affects the municipalities' possibility to make suitable decisions regarding parking. Making better use of what is already built is part of making the construction sector more sustainable (Moffatt & Russell, 2001). If a real estate developer or city does not know how many parking spots they currently have and where they are located, is it difficult to know if more is needed to be built. Parking regulations have furthermore been pointed out as being a key policy measure a city can deploy for managing car ownership and thus move towards a more sustainable transport system (Fastighetsägarna, 2018). Having a mapping of the current parking situation and whether the supply of parking spots is in line with the direction that a city wants to move in is therefore of value. Mapping of parking spots connects both the sustainability aspects as well as working as a knowledge base for more informed decision-making.



*Figure 5.13 Shows whether the surveyed Swedish municipalities have mapped the number of parking spots in the municipality or not. n = 68.*

As can be seen in Figure 5.13, there is a rather large difference regarding whether the municipalities have their parking spots mapped or not. In total, 46% of the municipalities have mapped their parking spots. A general trend is that smaller municipalities to a large extent have their parking spots mapped, in comparison with the larger ones. This can likely be explained by smaller municipalities having fewer parking spots in the municipality making it an easier task to conduct. The respondent from the city of Malmö means that mapping parking spots is a rather resource-demanding job and they have not prioritised it yet. They do however state that they have mapped the number of parking spots on publicly owned land, and in densification projects, the off-street parking situation has been mapped as well. The city of Gothenburg has not mapped the parking supply in the city, but they have general data on transport mode choices and car ownership. The latter part of data on car ownership is something the respondent from the city of Gothenburg means that they are working on developing further as they want to establish the connection between car ownership and different types of housing. They see this as giving the city a better understanding of how car ownership in different types of housing correlates with their parking number. The city of Stockholm has not done any thorough data gathering mapping the parking supply in the city, the respondent however means that they have some data but see it as when they need that data for specific projects, it can be gathered specifically for those cases.

One of the smaller municipalities that have their parking supply mapped is the municipality of Trelleborg. They have mapped both the number of parking spots as well as the occupancy rate of them. The reason for them conducting this is according to the respondent that they see it as giving the municipality the ability to make more evidence-based decisions regarding issues related to parking. The respondent sees that a general feeling in the municipality has been that it is hard to find vacant parking spots in the city, but when analysing the actual data and looking at the parking spots

and their occupancy rate can it be seen that there are plenty of vacant parking spots in the city, and that the city even could afford to reduce the number of parking spots and still satisfy the demand. The part of having the occupancy rate mapped as well is something that the respondent from the city of Malmö also sees as valuable for making decisions about the future.

The respondent from the city of Gothenburg furthermore means that there is a value in having a more comprehensive mapping of the parking supply on a neighbourhood level rather than in individual properties. Moving forward will they be working with more neighbourhood plans, which will be somewhat of a middle ground between a comprehensive and a detailed development plan. The parking situation will be considered and be a part of these plans while the city sees this as enabling them to make more informed decisions regarding parking and mobility on a neighbourhood level and working towards the city's sustainability goals. The researcher F. Sprei sees this development as positive as there is a trend of putting too much emphasis on the parking supply in individual properties rather than there being enough parking supply in the area. She refers to the project Brf Viva where no parking spots were built on the property, and where the parking demand was satisfied by there being available parking spots in the surrounding area. Sprei means that there is a need for more knowledge about how the parking situation is in larger areas. The mobility expert A. Roth refers to the same project and says that mapping the parking situation in an area is of value for making suitable choices regarding parking moving forward.

The municipality is not the only part for which the mapping of the parking supply could be of value. Schnurr et al. (2021) means that real estate owners mapping their parking supply and usage is important because it enables them to get an actual picture of the revenue coming from parking fees and what the parking spots are worth monetarily. With this as a base can they make better and more business-oriented decisions moving forward regarding whether they should supply more or fewer parking spots to get a better utilisation of their resources. This is something that the Framtiden group wants to work more with moving forward, to get to know the state and quantity of what they have at their disposal. The respondents from Framtiden byggutveckling furthermore view this as something that they need to do before they possibly start selling their parking spots through parking purchases. The respondent from Bostadsbolaget states that they have too little knowledge of the state of their parking spaces, something that they will need more information about in their work of transitioning to only supplying permit parking and in their densification efforts. In general, do the real estate owners interviewed have data on the parking supply in their respective properties, but they do not have a complete picture regarding parking supply in neighbourhoods and the occupancy of their parking spots. This is something that this thesis identifies as valuable for making more informed decisions moving forward to reach a more sustainable and efficient use of resources.

To summarise, can it be seen that whether municipalities have mapped their parking spots or not differs between municipalities, some have done it and some have not. There is value in having parking spots mapped in a city, not just on the property level but especially in larger areas. In general, do the interviewed municipalities see the value it would bring in working as a base for more informed decision-making, it is however acknowledged that it is a rather resource-demanding job. Furthermore, is there value for real estate companies to have their parking spots mapped as well, as

this enables them to have better knowledge regarding what assets they have, how they are used, and how they could work more efficiently moving forward.

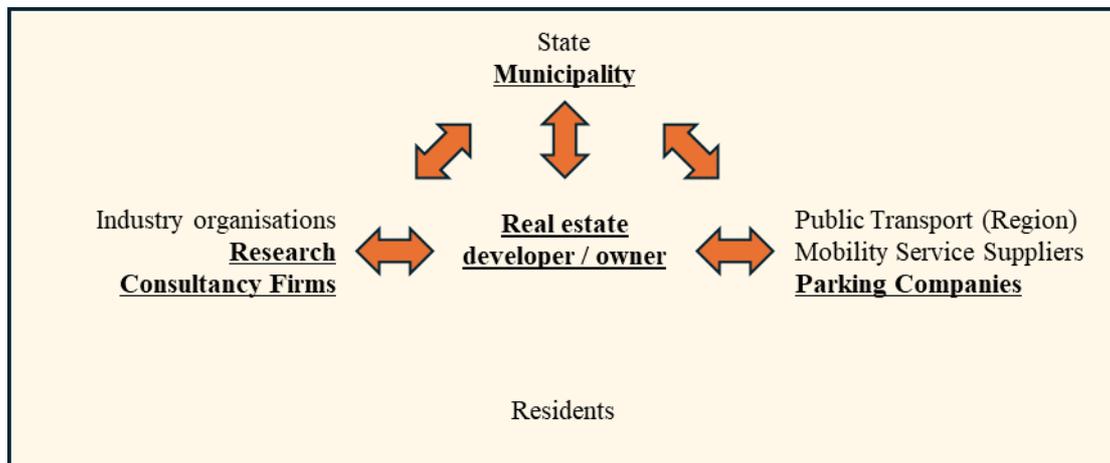


Figure 5.14 The key actors in the process of mapping parking spots, underlined and marked in bold, as well as in which directions they can promote change.

Figure 5.14 shows the key actors in the process of mapping parking spots, as well as how they relate to each other. In the mapping of parking spots, the municipalities and real estate companies are key actors, and they have both agency and capacity. The municipalities play a crucial role in mapping what the supply of parking looks like in the entire city as well as in specific neighbourhoods. Doing this will as mentioned set a base of what the current situation looks like enabling informed planning and decision-making moving forward. Real estate actors, parking companies included, also have a job to do in this regard with mapping their parking supply as well, as this will enable a better understanding of what resources they have to work with, as well as connecting to achieving a more neighbourhood perspective and better enabling for parking purchase to be conducted. The real estate actors and parking companies can furthermore push the municipalities to increase their mapping. Consultancy firms have the capacity in the mapping of parking spots as they have the resources and knowledge to conduct the task. The consultancy firms gathering knowledge regarding these matters is important but also sharing their value and expertise back to the municipalities and real estate actors as well as to other parties. Researchers also have agency in these matters, in that they have the knowledge regarding the benefits of mapping and can to a larger extent share this knowledge with municipalities and real estate companies.

## 5.5.2 Research and science

To base decisions and the ways of working on what science says as well as on what is proven to work is an area identified where there is room for improvement connected to issues related to parking and mobility. An example connected to this is flexible parking requirements and that the number of bicycle parking spots demanded to lower the car parking number often is a lot higher than the actual demand. The respondent from Stena fastigheter states that there needs to be a better balance in the municipal demands and that the demands put on real estate developers and owners must be better aligned with the demands of the residents. The consultant L-B. Ekman exemplifies the high demands on bicycle parking in the project Masthuggskajen

where they built 240 bicycle parking racks for 129 apartments, these high numbers proved difficult to arrange space for in the property, leading to the developer having to invest in developing a special four-story bicycle parking solution to fit the demanded bicycle parking in the project. Similar thoughts on too high demands for bicycle parking have been brought up by most of the real estate actors. The respondents from Bonava put it as this being an insufficient use of space, space that could have been used for something that could produce more value for the residents and something that they want to use. The respondents from Bonava would like to see the demands be more experienced-based and that the requirements do not inhibit developers' flexibility.

Similar opinions are brought up by Trivector et al. (2022) in that there is a lack of knowledge regarding what mobility services are suitable for different types of projects and what their actual effects are on the construction of housing and car ownership. Some investigations have been started, looking into the effects mobility services have on car ownership, which in the long run can be translated into the demand for parking. One example is Tyréns (2023) who concluded that some important factors regarding mobility services are the information and communication targeted towards the residents, how much reduction in car ownership mobility services can lead to is rather project-specific and when implementing a carpool is the design of importance. This is a start, but more research connected to this is needed to be able to lean on a solid base of evidence when making decisions.

Furthermore, Trivector et al. (2022) state that more research is needed regarding how real estate owners can use parking spaces more efficiently and that there is a need for more guidance for municipalities. Connected to this, the respondent from Genova requests more knowledge sharing regarding the possibility of using shared parking facilities, which is part of using parking spaces more efficiently. More knowledge regarding parking purchase is needed and how sharing of parking facilities affects residents' willingness to own a car. For instance, Guo (2013) found that the parking supply near one's home is connected to a higher degree of car ownership. But what walking 700m, as in the case of Brf Viva, has for impacts on car ownership and how it can be reflected in the parking numbers required by the municipalities is an interesting question. In addition to this has the question of converting parking facilities to other uses in the future been brought up. The respondents from ByggVesta stress the importance of not building parking facilities that might not be used in the future and that only building based on what is seen as suitable to cover the current demand might show itself in the future as a bad way of using resources and a bad investment. The city of Malmö has started working more foresighted when they are constructing shared parking facilities, in that they are trying to plan for the parking facilities to be able to be converted for other uses in the future if the demand for parking becomes lower. More research is needed towards how to adapt the current parking facilities for other uses in the future, as well as being mindful and planning for conversion when new parking facilities are being developed.

Furthermore, is the point of sharing as brought up by the respondent from Genova a general theme from the interviews and it is a point where more emphasis is needed to be put. The researcher F. Sprei states that there sometimes is knowledge in the municipalities regarding these issues, but that the knowledge is held by certain individuals and not spread throughout the organisations and to other actors as well.

This leads according to Sprei to politicians and city officials being afraid of making decisions that decrease the addition of parking spots to the extent needed to steer towards a more sustainable transport system. The consultant P. Bergström Jonsson takes up SALAR as an industry organisation where different municipalities can share knowledge and learn together. He states that there generally is a willingness in the municipalities to take learnings from other municipalities and increase the knowledge of what measures have worked elsewhere in matters related to building, traffic, and parking. The respondent from the municipality of Trelleborg states that parking being an emotionally loaded question means that when decisions are made and requirements implemented, they need to be based on experience and on what is proven to work to be considered in the first place. He furthermore states that in these politically sensitive matters it is important that larger municipalities lead the way and show what works and what does not, this is important for smaller municipalities to feel comfortable in their decisions and follow in what has been proven to work. Additionally, a general theme from the interviews is that some actors possess knowledge but that it is not well enough spread throughout the industry, something that is needed more of moving forward.

To summarise, is it clear that there is a need for more knowledge in matters regarding parking and mobility. Examples of areas identified where more research and evidence are needed are regarding how much bicycle parking is reasonable to demand, how effective different mobility solutions are in reducing car ownership in practice, how longer distances from residents' homes to parking spots affect car ownership and parking demand, as well as how parking facilities can be converted for other uses in the future, among others. Furthermore, is there a tendency for knowledge to sit with certain actors, and a key point is that knowledge needs to be more spread, both within and between different companies and stakeholders, for the sector to move forward as a whole.

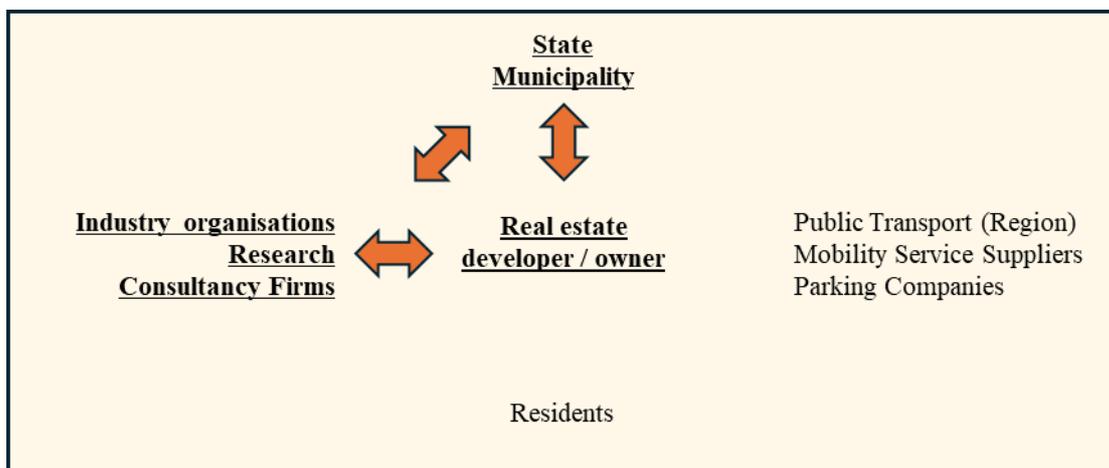


Figure 5.15 The key actors in producing more research and science in matters related to parking and mobility, underlined and marked in bold, as well as in which directions they can promote change.

In providing the research and science will researchers be the key stakeholders and they have the capacity to identify and further look into where there are knowledge gaps and room for further investigation. Furthermore, are there plenty of consultancy reports published on these matters, leading to consultancy firms having capacity and

being an important part here as well, supplying their expertise and sharing their insights. Both municipalities, real estate actors as well as industry organisations and the state have agency in these matters regarding funding, requesting, and enabling what from their perspective is missing in terms of knowledge. In addition to this, all mentioned actors have a responsibility to share their insights and knowledge across and within their organisations and stakeholder groups to get the requested knowledge sharing and joint development moving forward.

### **5.5.3 Evaluation and follow-up**

A part of the need for knowledge, as described in the chapters above, can be in the form of cases that have been proven to work in other cases and cities. Roth (2018) states that to what extent different initiatives regarding low parking requirements are followed up on differs between cases. Furthermore, it is said that there is a demand for knowledge regarding these matters and evaluating the effects of different sustainable parking initiatives is important for building up the sector's knowledge base and comparing effects and outcomes between different projects and cases. Similar to the case with following up on cases with low parking requirements is the evaluation of mobility services needed to a larger extent (Schnurr et al., 2021). The follow-up done so far has revolved around the effects on the individual's mobility habits, rather than looking into whether the mobility services in question fulfil the individual's actual mobility need. These evaluations are valuable knowledge for increasing the knowledge of the actual effects of mobility efforts (Arnehed, 2019). Furthermore, has it been reported that whether the minimum parking requirements set by municipalities are in line with the actual demand for parking rarely is evaluated by the municipalities (Holm & Ivansson, 2022). Final parking numbers are usually influenced by good judgement and experience by the one accepting the parking number when the building permit is given, Holm & Ivansson (2022) ask where this experience is coming from when systemised evaluation is lacking. They argue that this fact is surprising while parking supply strongly correlates with traffic flows, and not surprising since evaluation can be a resource-demanding task. Theory in practice (2019) states that it is important to measure how actual results are measured against goals and that cooperation around the evaluations is of great value for finding innovative and viable solutions moving forward.

To summarise, the evaluation part has been found as a general theme from the interviews, both from municipalities and real estate actors that a lot of times they base statements on qualified guesses rather than actual results that are presented. Similarly to the mapping, is the evaluation and follow-up on improvement efforts important to have as a current situation and something to improve on. This also enables working on these matters iteratively and improving upon solutions and ways of working making continuous improvements and suitable adjustments (Schnurr et al., 2021). This demands an environment where it is accepted that missteps will be taken in the efforts to find more effective solutions and processes.

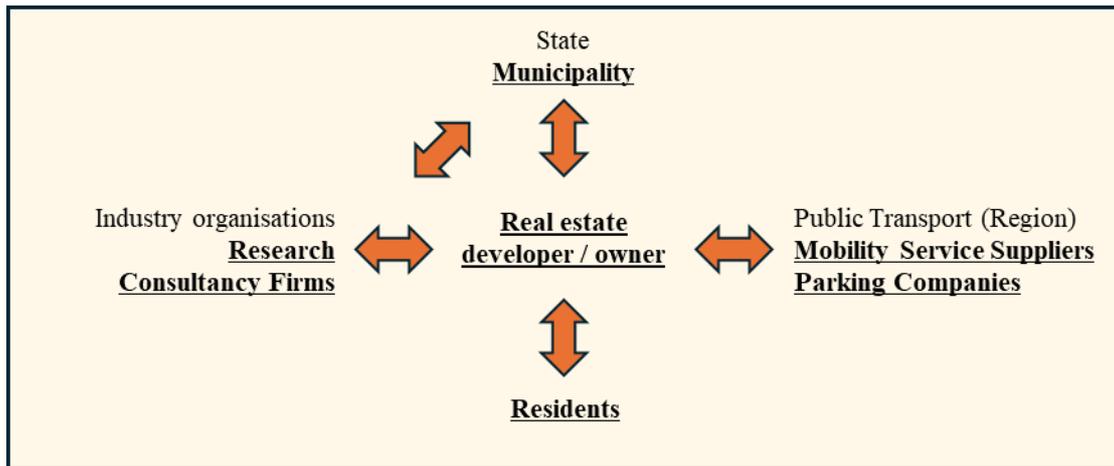


Figure 5.16 The key actors in the process of evaluation and follow-up, underlined and marked in bold, as well as in which directions they can promote change.

In Figure 5.16 are the key actors connected to the evaluation and follow-up shown, as well as how they relate. Municipalities have the capacity to do so in that they can evaluate and iterate on their requirements, as well as enable more flexibility in their demands put on developers. They furthermore have the agency to do so in their pursuit of having parking requirements that are better aligned with the work of having a more sustainable city, both regarding transport and construction. The real estate actors as well as parking companies will also play an important role in this as they are the ones seeing firsthand the effects that different parking requirements have on their properties and through feedback from residents. The real estate actors also have the possibility of pushing for change in the municipality and making their voices heard regarding what they need and request. Residents have agency in these matters in that they are the ones experiencing how, for instance, different mobility services work, and can provide their experiences to their real estate owners. Mobility service suppliers have capacity in that they can have a dialogue with real estate owners about how the mobility services are designed and how they can be improved. Researchers and consultancy firms have capacity in these matters, researchers in that they can provide knowledge regarding suitable ways of moving forward, and consultants in that they can provide their knowledge in evaluation to municipalities and real estate companies and how to interpret results to iterate and work forward.

## 5.6 Daring to look forward

As described in Chapter 5.1, the historical aspects of parking, are the Swedish legislation and municipal parking requirements largely a remnant of a time when the car was the ideal and viewed as the future. A lot has happened since the 1960s and planning for the car is no longer a viable solution for meeting future demands. Individuals travelling habits have changed and the demand for alternative modes of mobility is becoming increased (Schnurr et al., 2021). This will furthermore likely lead to a decrease in the need for car parking.

A general theme from interviews is that Swedish municipalities are afraid that their requirements will not manage the demands in the PBL if they change too much and if they demand too little parking. The researcher F. Sprei refers to the car norm making

municipalities afraid to be wrong and the possible repercussions they might get. To enable municipalities to not be as locked in the constraints of planning mobility around car parking has there been suggestions to change the formulation in the PBL 8 Ch. 9 § 4 p. from "...suitable space for parking, loading and unloading of vehicles parking" to "...suitable space for mobility services" (SOU 2021:23). The thought is that this change in legislation would enable municipalities to a larger extent demand that real estate owners take responsibility for supplying the demand for mobility that the property gives rise to rather than supplying sufficient car parking space, meaning a shift in focus from the car to mobility in general instead. The legal expert Å. Romson however means that with the PBL's current formulation, municipalities have rather large possibilities of demanding sufficient mobility rather than sufficient parking. The reason for municipal requirements revolving around parking spots is that the norm of planning for the car is still deeply rooted, leading to municipalities planning for parking. According to Å. Romson will nothing happen if a municipality demands an abundance of parking to be built, but if they are too tough in their requirements and demand less parking than what is currently demanded, then protests are coming. Regarding this, Å. Romson states that it should be the other way around, that the carrot should be to move away from a car-dependent society and promote alternative and more sustainable mobility instead. As mentioned, do municipalities today have the legal possibility to change, in practice is however the norm of monitoring parking deeply rooted, moving away from the word "parking" would instead incentivise municipalities to do this more easily. The mobility expert A. Roth concurs with this and states that municipalities have legal possibilities today but that a change would shift the focus and point out the way forward, as well as being a supportive argument for those who are in favour of a less car-dependent society.

Opinions, connected to the notion of planning around the car and being stuck in outdated norms, have been lifted by real estate developers and owners. They in general request more flexibility and foresightedness in the municipal demands. The respondent from Wallenstam states that they do not want to lock resources in parking facilities that might not be used in the future. The respondents from ByggVesta follow this line of thought and state that the fact that the municipalities are demanding developers to build parking based on the norm and the situation today, does not mean that it will be relevant in 20 years. The current requirements will probably lead to them building expensive, both monetary and climate-wise, facilities to supply a demand that probably is not going to be there in the future. ByggVesta states that it is needed to look ahead and plan for the future instead. On the same note has Framtiden Byggutveckling run into related issues in their densification pursuits. They are going to switch to permit parking, supply a mobility package to all their residents in both current properties and new developments, as well as increase the prices of the parking spots. According to the mobility expert A. Roth is the Framtiden group doing everything they should to lower their demand for parking. Their issue however is that when they are densifying, they are building housing on land currently used for parking, meaning that they according to the municipality need to replace the number of existing parking spots based on today's situation and demand. The respondents from Framtiden byggutveckling see it as being more suitable if they could look forward and replace the parking based on the forecasted demand for parking in 2030 or 2040 when the development in the area is finished and their permit parking, mobility services and price increase has been fully implemented and lowered the parking demand. They see that the current way of working will lead to them building

more parking than what will be used. Connected to this the respondent from Bostadsbolaget mentioned that when they want to change the municipal parking numbers in retrospect on existing properties, they need to do a study looking at the utilisation rate of the parking spots going years back. They however state that this is not optimal and that they want to look forward instead. The respondent from the city of Gothenburg means that the question of replacement of parking spots is a question that will become even more important in the city in the coming years, as the city becomes more densified. The aim of utilisation studies is to look back 5 years in time but the city is working more on finding what a suitable time frame really is. Regarding the Framtiden case does the mobility expert A. Roth emphasise the fact that the increase of the price on their parking spots, rather self-explanatory will lead to a decrease in the attractiveness of their parking spots, leading to a lower demand for them. He speculates that the situation now might lead to them building parking facilities with a utilisation rate of 30% since they are designed based on an old demand despite them lowering the demand through increasing the price as well as adding mobility services and switching to permit parking.

The legal expert Å. Romson means that there are no laws controlling how many years backwards a utilisation study needs to look at and that using a utilisation study is a custom that municipalities are following to maintain an equivalence in their demands on the developers. The municipalities have a responsibility to control and prevent that cars do not end up parked on the streets instead of where they should be, which is why they feel that they must regulate this. However, you can also say that it is up to the municipality to regulate so that it is not allowed to park on the streets in the area, then would this not be a problem. Å. Romson furthermore states that municipalities should be positive to developers wanting to show that the need for parking is not as large anymore. As mentioned, real estate owners and developers do not want to build more parking spots than what is being used since it is expensive, and it ties up resources when there might not even be a demand in the future. The respondent from Stena fastigheter puts it as being important to look at the existing residents and find solutions to cover their mobility demand in other ways than parking, as well as there being a need to look for a long-term solution, not only fixing today's situation. The city of Malmö has an alternative solution to using utilisation studies where they are looking at the average car ownership in the area and base the number of replacement parking spots on that rather than the previous parking number. The respondent from the city of Malmö means that the reason for them looking at car ownership rather than typical occupancy studies is because the price of parking has historically been lower on parking spots on surrounding streets, which has led to cars parking there instead of in the parking facilities at properties, meaning that occupancy studies becoming misleading as they do not reflect the actual demand for parking.

In summary, to reach the sustainability goals of creating sustainable and liveable cities, there is a need to start planning for the cities we want in the future instead of planning after the demands based on old norms and interpretations. To do so, all stakeholders, but essentially the municipalities, must let go of the fear of creating too few parking spots today, and instead look at which mobility situation that is required in the future. Sustainable solutions must be premiered going forward.

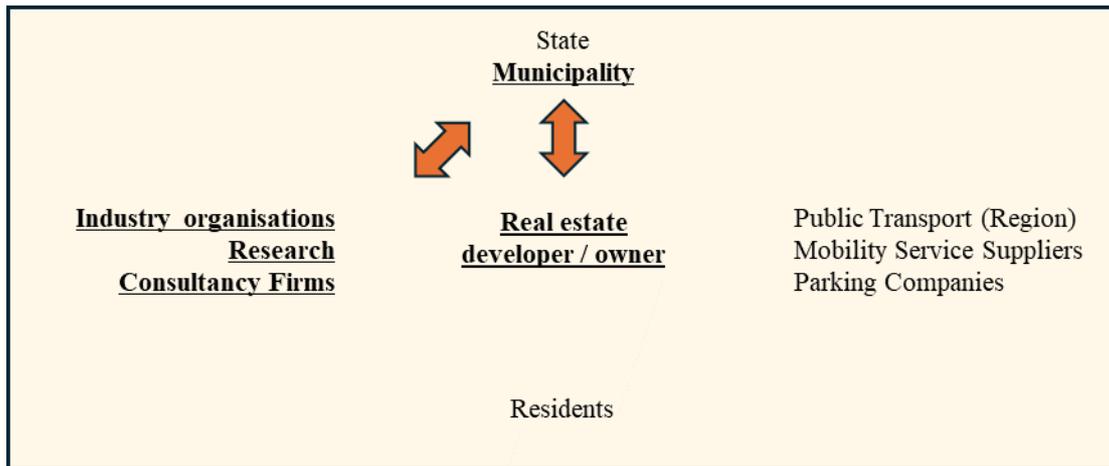


Figure 5.17 The key actors in the process of looking more forward, underlined and marked in bold, as well as in which directions they can promote change.

As is shown in Figure 5.17 are municipalities a central actor and they have both agency and capacity for working more foresighted and to plan for what we want the future to look like rather than only supplying the current demand and basing decisions on previous norms. These decisions and toughness in formulating requirements might be controversial but are essential for changing the situation. The municipalities will need to listen to what the real estate actors are stating and expressing as well. The real estate companies have agency in working more foresighted and they also need to become more expressive and try to influence and make their voices heard for the municipalities to change. As discussed, do municipalities have opportunities to plan more for the future and are not as restricted as they sometimes think. To overcome the barrier of working based on what actually works and what is possible rather than what people think will research and consultancy firms play an important part. They have capacity to investigate what the possibilities and situation really look like, as well as share knowledge with the municipalities for more informed decision-making when requirements are formulated. Furthermore, does looking forward and planning for the future connect to Chapter 5.5. Mapping the current situation, evaluating the current ways of working and putting more research towards looking into better solutions and to map what the possibilities really look like, are all important for being able to have a solid foundation and knowledge base for making more forward-looking decisions. When this is done, then can more daring decisions be made.

## 5.7 Create a market for increased sharing around parking and mobility

According to the mobility expert A. Roth, the most important action to improve the current situation is to create a market for parking and mobility, especially in cities. To reach a functioning market, it has been identified during the thesis that there is a need for more collaboration between actors, leading to planning for parking and mobility on a neighbourhood level. Furthermore, there is a need for more sharing in a functioning future market, making permit parking and shared permit parking play an essential role. For the market to function, the subsidisation of on-street parking must be removed to create fair competition in market conditions. It is first when all of this is achieved that it is possible to reach a functioning market for shared parking and

mobility. To do so, both more evidence-based decisions and more daring stakeholders are needed. All of this will be discussed further in this chapter.

### 5.7.1 Planning on a neighbourhood level

As mentioned in Chapter 5.4, both municipalities and developers generally want to switch focus away from supplying the parking and mobility demand in the respective facilities and instead plan and solve the demand at a neighbourhood level. Using a neighbourhood perspective and supplying the demand for parking and mobility in shared facilities should be the norm instead of an exception as it is today.

Furthermore, as mentioned in Chapter 5.5.1 about mapping, the city of Gothenburg wants to work with more neighbourhood plans, which will be somewhat of a middle ground between a comprehensive and a detailed development plan, to work towards the city's sustainability goals. Furthermore, the researcher F. Sprei lifts this as a step in the right direction, instead of planning for parking to be supplied in each respective property. Similarly, the consultant P. Bergström Jonsson states that there is a need to lift parking and mobility to a higher level than the building permit process, preferably already in the planning program process or otherwise in the detailed development process, to manage parking better through a neighbourhood perspective, enabling wider use of shared parking facilities. In summary, it can be said that lifting the planning to earlier stages and a neighbourhood perspective will enable more sharing and collaboration between actors, setting a basis for a market around shared parking and mobility.

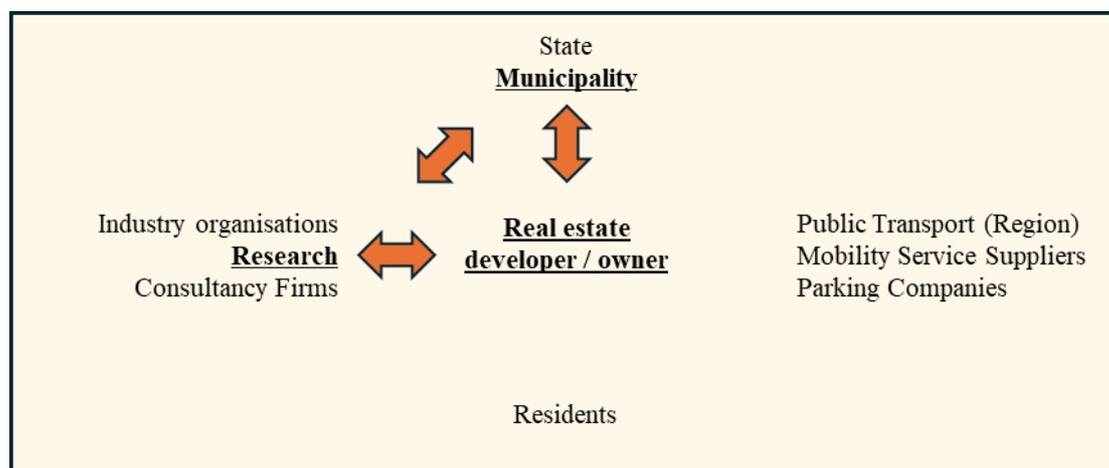


Figure 5.18 The key actors in the process of lifting the planning to a neighbourhood level, underlined and marked in bold, as well as in which directions they can promote change.

As can be seen in Figure 5.18, the key stakeholders in lifting the planning of parking and mobility to a neighbourhood level are the municipalities, the real estate developers, and the researchers. Since the municipalities have a planning monopoly in Sweden, they are the ones with the most capacity since they set the requirements that the developers must follow. They also have agency since it can lead to more sustainable solutions, which is in the municipalities' interest. Furthermore, the developers have agency, both through the fact that it is more sustainable as well as shared solutions often become more financially beneficial. They also have some capacity, not at the same level as the municipalities, but in the form of pushing the

municipalities as well as through using the possibilities given. The researchers have agency in highlighting the effects of, and the evidence behind, using a neighbourhood perspective and shared solutions to the other key stakeholders.

### **5.7.2 Permit parking & shared permit parking.**

The norm, which historically has been that residents have their own reserved parking spots, has lately started to shift towards a system where parking spots are shared to a larger extent. This is usually regulated through permit parking, where each resident gets a parking permit allowing them to park their car in any vacant spot in a specified area of parking spaces (SKR, 2021). Stena fastigheter works almost exclusively with permit parking connected to their properties and the respondent sees this as being in line with shifting to a more sustainable transport system and having fewer parking spots. Framtiden Byggutveckling is working in the same way, where they in the entire Framtiden Group only allows permit parking and no reserved spots in conjunction with their new developments. The goal is eventually to implement permit parking in their entire property portfolio, including switching to this in the already built environment as well. Bostadsbolaget, who is a part of the Framtiden group, sees permit parking as an important part of the group's effort to switch to a more sustainable mobility system. In their densification projects is the switch to permit parking allowing them to supply fewer new parking spots and use the space more efficiently, which goes in line with their ambition to follow the city's climate goals.

Taking permit parking one step further is to use shared permit parking, meaning that people belonging to different groups of users can all have parking permits for the same parking facilities and utilise the spots at different times of the day (SKR, 2021). Shared permit parking can lead to higher utilisation of parking spots and a more stable utilisation rate of parking spots during the day, leading to the total number of parking spots in a parking facility or neighbourhood being able to be reduced. In the city of Gothenburg is shared permit parking a part of their flexible parking numbers and it can lead to a reduction in the parking number at new developments (Göteborgs Stad, 2018). The respondent from Genova however points out that it varies between municipalities in Sweden how open they are to use shared permit parking as a means for reducing the total parking demand. Furthermore, the respondent mentions that it is one of the first things they investigate when calculating the demand for parking in new developments as they see it as a rather convenient way of utilising parking spots, especially in areas with mixed use. Both the respondents from Wallenstam and ByggVesta concur with this and view shared permit parking as beneficial if there is a good mix of different businesses in an area. The respondent from Wallenstam furthermore means that people having private reserved parking spots is a bit of an obsolete way of looking at parking. The sharing of parking spaces furthermore goes in line with a move more towards a sharing economy (Xu et al., 2019). Sharing parking spots makes sense since parking spots as reported tend to be underutilised, and the concept of the sharing economy allows for greater use of underutilised resources (Boar et al., 2020). Making better use of parking spaces and utilising the parking spaces to a higher extent goes in line with sustainability as it reduces the need for supplying more parking than necessary to satisfy the demand.

The mobility expert A. Roth views shared permit parking as one of the most valuable tools in planning for less parking. He sees the biggest possibilities for implementation

being in larger new development areas and states that if done well can the total parking supply in an area be reduced by 50%. Other numbers for how much the sharing of parking spaces can reduce the total parking supply as mentioned by Litman (2023) is a 10-30% reduction. More ambitious reductions that are in line with A. Roth's statement is that 40-60% reduction in the total parking supply is possible when sharing parking spaces (Victoria Transport Policy Institute, 2015). Furthermore, A. Roth states that shared permit parking makes it less attractive to own a car when one does not have one's own reserved spot. An issue however concerning shared permit parking lifted by Stena fastigheter is that if the shared permit parking includes several different parking facilities in an area, can it become hard to have an even and harmonised distribution of in which of the parking facilities people park their car. Another challenge when working with switching over to residents having parking permits instead of their own reserved spots mentioned by the respondent from Balder is that residents sometimes feel like they have lost something and are in general against such changes. With good communication and time does however these negative attitudes usually resolve themselves as people adapt to a new normal. The municipality of Trelleborg furthermore mentions a challenge with shared permit parking being that the standardised tables some municipalities use when calculating a parking number for shared permit parking are not always up to date. For instance, have the way residents park their cars changed as more people are working from home, meaning that you cannot take for granted that residents will not use the spots during the day.

In summary, it can be said that permit parking and shared permit parking both increase the utilisation of parking facilities and contribute to the sharing economy. There are some challenges with shared permit parking that need to be bridged, however, the use is important for reaching a functioning market for shared parking.

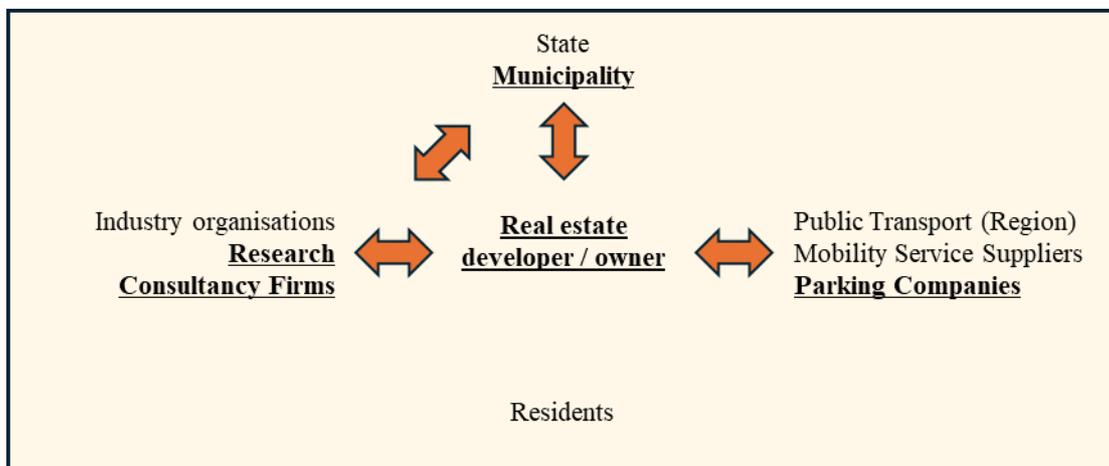


Figure 5.19 The key actors in the process of enabling and implementing permit parking and shared permit parking, underlined and marked in bold, as well as in which directions they can promote change.

As shown in Figure 5.19 can it be seen that the real estate companies are key actors in implementing shared permit parking, as they have both agency in that they in general see benefits of using shared permit parking, and capacity in that they can switch over and implement it more. The parking companies also have both agency and capacity in that they benefit from its implementation and can make it happen. Municipalities have

agency in that allowing for shared permit parking to a greater extent would benefit them in more efficient and sustainable use of parking spots in the municipality, enabling space to be used for other more value-adding qualities in the city. As stated by Genova it differs between municipalities how they allow for shared permit parking, meaning that they as municipalities have capacity in that they set the rule book and have the possibilities to allow for it to a greater extent. Researchers have agency in this as they can supply both municipalities and real estate companies with knowledge regarding the benefits of shared permit parking. As stated earlier in the chapter is there different estimations for how large a reduction of parking spots shared permit parking can lead to, thus can consultancy firms play a role here having the possibility to help the municipalities and real estate companies in clearing up how effective shared permit parking actually is in specific cases.

### **5.7.3 Regulation of on-street parking**

It is not just the developer paying to construct parking spots in conjunction with a property, the residents using the parking spots pay a fee for using the parking spots. The system with minimum parking requirements leads to the construction cost of parking spaces becoming internalised in the total construction cost of the property (D. Shoup, 2018). The construction cost of the parking being included in the total construction cost leads to the cost of building parking being paid by all residents, regardless of whether they having a car and use the parking spots or not, through their rent, fee or through the price they are paying when they are purchasing the apartment. (Svensson & Hedström, 2010). The respondent from Stena fastigheter sees it as hard to divide the construction cost of parking to only the ones using it, as the parking is part of the building, and for the entire cost calculation to work on the bottom line, the total project usually takes part of the construction cost of parking. This emphasises what is stated in chapter 5.2 regarding the cost of constructing parking, and that it is challenging to specify which costs to attribute to the construction of parking. The researcher F. Sprei, however, sees it as residents not having a car, paying part of the cost of parking for people having a car, in the long run, becomes a subsidising of car use. Something that she means is not viable if the society is going to move towards a more sustainable transport system, which is needed to happen.

An example, for the actual price for a parking spot to get full cost coverage in an underground garage, is that the monthly fee for the user would have to be 4000 SEK when considering a 10% rate of return (Fastighetsägarna et al., 2020). This example is based on a case in Stockholm, the price for parking in the garage is 1700 SEK per month, meaning that the parking spots are subsidised by more than 50%. The consultant P. Bergström Jonsson mentions another price example that is a bit more on the high end, a parking spot costing 750 000 SEK per parking spot would entail a price of 5500 SEK per month by the user to get full cost coverage. The respondent from the city of Gothenburg means that they would like real estate companies to not subsidise parking and they want some sort of declaration of cost coverage related to the parking facilities in the detailed development plan, they do however state that this is nothing they can govern and demand developers not to include the cost of building parking in all residents' rent or fee. The legal expert Å. Romson however states that municipalities can take the financial aspect of parking facilities more into account than they are today when they evaluate how feasible the solutions and constructions

are. Real developers however express that getting full cost coverage in parking facilities from fees alone is challenging. The respondents from ByggVesta state they cannot take out the full cost of the parking spots as people are unwilling to pay more than what they are used to. The respondent from Stena fastigheter means that there is an old picture that parking is cheap, and that it should cost less than what it does.

The overall picture from the interviews with real estate owners and developers is that the pricing of parking in their parking facilities becomes even more challenging when there is cheap or sometimes even free parking on the streets on publicly owned land in the adjacent neighbourhood. This leads to a shift from people parking in the parking facilities connected to the properties to instead park on the streets where it is cheaper. This leads to vacancies in the parking facilities on privately owned land, and to cover the loss of a calculated income, respondents from both Bonava and Wallenstam state that this can lead to increasing the rent for all residents. This notion is furthermore confirmed by Svensson & Hedström (2010), who state that it is the people without a car who are affected the most by this, as they are the ones having to pay even more for something they are not even using themselves. The respondent from Wallenstam however states that with the cost of building parking being a part of the overall investment cost of building, the income from parking fees becomes combined with the rest of the income in the end. Even though most real estate actors are stating that they cannot take out the full price of parking in the parking fees, Framtiden Byggutveckling states that moving forward will their parking facilities cover their own costs. This indicates that real estate actors can take out the full cost of parking if they are tough and goal-oriented enough.

Avoiding this move of cars parking on publicly owned land to instead parking on privately owned would require it being more expensive to park on publicly owned land. People in general park their car where it is the cheapest. Parking fees for parking on publicly owned land rarely cover the operation and maintenance cost of the parking spots (SOU 2021:23). An example from Uppsala shows that there are 10,000 parking spots in the municipality, 3800 of which are chargeable with parking fees. The 10,000 parking spots cost in total 120 million SEK annually in tax money to operate and maintain, the revenue from parking fees is however only around 33 million SEK annually, meaning a deficit of 87 million SEK in subsidisation from tax money. If these numbers are applied to the whole country of Sweden, with roughly 70% subsidisation, this would in monetary terms lead to a subsidisation of 3,4 billion SEK annually of parking spots on publicly owned land (Fastighetsägarna et al., 2020).

The price put on parking on publicly owned land is regulated through the act (SFS 1957:259), for short called KAL, or the *Municipal Fees Act*. KAL (SFS 1957:259) 2 § states that:

*“To the extent necessary to manage the traffic has the municipality the right to take out compensation in the form of a fee for the right to park on such public locations that are under municipal management and that the municipality has designated for parking.”*

The municipalities see it as difficult to, regarding the law KAL, implement or increase the price of parking spots on publicly owned land (Pädam et al., 2022). The city of

Gothenburg has historically viewed it as that they cannot implement parking fees on publicly owned land unless there are, as the law states, reasons for managing the traffic or if there is bad accessibility of parking spots. The respondent from the city of Gothenburg means that they have however initiated discussions about whether they would be able to implement and increase prices anyway, as there is a legal case where Örebro got the right to increase parking prices as they motivated the increase with it being in line with the city's environmental goals. A similar case took place in Malmö in 2017, where the city decided to put a fee on all street parking in a new development area, the city motivated their actions with the city having a long-term goal to reduce car usage in the city and area (Romson, 2022). Their implementation of the parking fees was applied to the Swedish Transport Agency by condominiums in the area, the city of Malmö however won the case, and the fee was to be implemented. The motivation behind the Swedish Transport Agency's decision was that the municipality is responsible for the traffic regulation in the city, which is closely connected to the municipalities building, - planning and environmental policies and is thus to a large extent a municipal concern. The city of Stockholm is also planning on testing to increase prices based on arguments beyond those of managing the traffic. The city of Malmö has started to increase the price of parking on publicly owned land in an effort to harmonise the prices between off and on-street parking. Even though these municipalities are hopeful regarding the possibility of increasing the price of parking on publicly owned land, is the overall picture that municipalities in general are afraid that KAL is hindering them from doing so.

The legal expert Å. Romson however means that municipalities have rather large possibilities for increasing parking fees on publicly owned land. The reason for municipalities thinking that they cannot is partly because of bad legal practice, partly because of bad legal guidance through for instance bad legal comments and SALAR guidance. She does however acknowledge that it is a politically sensitive question to increase parking prices on publicly owned land, and it can be legally complicated to argue for the increases. But it is not impossible to increase the prices, on the contrary, Å. Romson means that the preparatory work for KAL intended that the law should follow the intended division of responsibilities as stated in the PBL, that the parking demand of cars should be satisfied on the properties and not by the public on publicly owned land. Publicly owned land should be accessible and long-term parking on publicly owned land should be an exception, and in the legal world should exceptions be very restrictive. Long-term parking on publicly owned land might be necessary in certain central areas of cities, it should however be removed where it is not necessary as it creates a skewed usage of the publicly owned land that is used in a way that it should not be. The system today creates an unfair subsidisation of parking. Å. Romson means that the first task is to stop allowing for long-term parking on publicly owned land, and then to move the parking of cars to other areas.

The legal expert Å. Romson furthermore says that KAL, or rather the Traffic Ordinance, states that parking fees are the second point of action after regulating through time limitations. She means that some municipalities consider it as hard to remove on-street parking, something that she means they have the authority to do on more streets, but most of all she thinks municipalities should use time regulation for on-street parking to a larger extent. If the municipality for instance only wants visitor parking, could they time regulate parking and not let cars be parked for more than for instance three hours. She does however acknowledge that a challenge with it is the

follow-up, it is much easier for municipalities to put a fee on a street, rather than to regulate through time and to monitor that people are following the time limitation. As Å. Romson sees it, is this law however a bit old fashioned, with promoting time regulation over fees. A change in the KAL, as suggested by for example Pädam et al. (2022), does Romson as well see as suitable, but not mainly because of municipalities' ability to increase the parking fees. KAL is today in practise a municipal tax, and taxes are not supposed to be governed on a municipal level, but rather on a state level. Thereby is KAL, as it is formulated today, not in line with the constitution. Romson states that there needs to be a reform that points at and gives the municipalities a constitutional, clear, and good instrument. When this is done can it be good to highlight parking fees and parking concessions on publicly owned land as a very important instrument to cherish car-restrictive and energy-efficient city planning.

To summarise and refer to the researcher F. Sprei, do municipalities with the current legislation have the possibilities to increase parking fees on publicly owned land and to work towards counteracting the move of parked cars from privately owned land, where the cars should be parked, to publicly owned land such as on streets. As the mobility expert A. Roth puts it, is it important to offer the municipalities guidance, KAL might not be the best legislation, but it is good enough to do most of the things they want if they use it in the right way. If the municipalities are more daring and become tougher in regulating parking on publicly owned land and stop allowing for long-term parking on publicly owned land, more cars will stay parked in the privately owned parking facilities. This would enable real estate owners to avoid the subsidisation of parking spots from all residents and let the ones using the parking spots be the ones to stand for the cost to a larger extent. Furthermore, will it mean that publicly owned parking spaces will be less of a financial loss for municipalities, as well as lowering the subsidisation of private car use which is in line with moving to a more sustainable transport system.

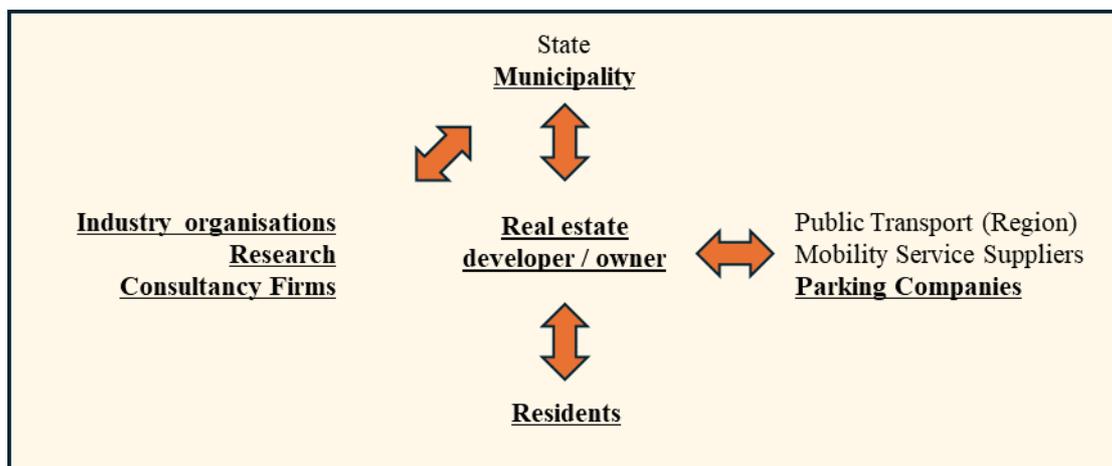


Figure 5.20 The key actors in the process of regulating on-street parking, underlined and marked in bold, as well as in which directions they can promote change.

In solving the issues connected to regulation of on-street parking are municipalities a key actor, having both the agency for solving this in their work towards more sustainable cities, as well as the capacity to be tougher in regulating parking on publicly owned land. As shown in Figure 5.20, industry organisations, research and

consultancy firms have a role in this as well, in that they can work with spreading the information to the municipalities regarding what their legal possibilities connected to KAL really are, as well as providing good examples for how to work with the legislation. Real estate companies and parking companies have agency in these matters, as they want to get better utilisation in the parking facilities. They can furthermore push the municipalities to regulate parking on publicly owned land in a tougher way where it leads to issues. Additionally, residents have a role to play as well, having agency and possibilities for carrying on their views of the parking situation in their neighbourhoods to their real estate owners if there is a need for improvements. For example, could it be things such as free on-street parking leading to an overflow of cars on streets, which is a bad environment for kids to play in or for them to live their daily lives.

#### **5.7.4 Parking market and Marketplace**

As discussed throughout this thesis, are there ecological and economic sustainability reasons for creating a functioning market around shared parking, and by adopting a neighbourhood perspective and moving away from solving parking at each respective property. To reach a well-functioning market, there are however some steps that need to be bridged. As described in Chapter 5.7.3 about the regulation of on-street parking, a crucial part of why parking facilities are not getting a reasonable utilisation rate or being a sensible economic investment is because of underpriced parking on publicly owned land. However, the legal possibilities to regulate it are much larger than what is generally assumed, and it is possible to regulate it with both price and time limitations to avoid the long-term parking of cars. Regulating on-street parking creates more economically functioning parking facilities as well as freeing up space on publicly owned land for more value-creating features. Furthermore, as described in Chapter 5.7.2, wider use of permit parking and shared permit parking can both increase the utilisation of parking facilities and contribute to the sharing economy. Additionally, as described in Chapter 5.4, using a neighbourhood perspective and supplying parking in shared facilities is easier in larger new development areas, although in the future is it interesting to further work with its implementation in the already built environment as well. Furthermore, when designing shared facilities is it more suitable to focus on above-ground parking solutions, as opposed to underground garages, as above-ground parking facilities have a higher level of perceived safety and can easier be changed to another purpose if the demand for parking becomes lower, as well as being cheaper to build compared to underground garages.

When sharing parking facilities between different real estate actors and properties, it is suitable to utilise parking purchases. The municipal parking purchase prices are, as discussed in Chapter 5.4.1 and visualised in Figure 5.9, generally too low to reasonably cover the construction cost. However, a risk with having a fixed price is that the price level becomes too high in order to cover the construction cost of garages, thus disabling the possibility for parking purchases in other types of facilities where the parking purchase price becomes more expensive than the construction cost. This can however be avoided to some extent by focusing on not building garages. As discussed in Chapter 5.4, real estate actors see some value in providing parking to their residents at the respective properties because of safety and as a selling argument. For a functioning parking purchase market is it thus important that parking purchase is more attractive than building and providing parking at the respective properties,

meaning that it is economically beneficial enough. This is a balancing act between covering enough of the building cost as well as being cheap enough to encourage its usage. It is, therefore, reasonable to work with a percentage of the construction cost as a base for the parking purchase price, for instance, 70-80%, or something similar. However, could it be valuable to offer price estimates in the early planning stages to indicate to developers what they can expect the investment to be. The remaining percentages of the construction cost can be covered by the parking fee paid by the users. Examples of operation and maintenance costs of parking spots indicate a cost of 100-300 SEK per parking spot and month (Sveriges Almänytt, n.d.). However, the price must be much higher than this to cover its part of the construction cost as well. Furthermore, if real estate companies are expected to cover for example 75% of the investment without sharing in the profits, might this lead to them preferring to construct the facilities independently. In a scenario where this becomes the reality and the market is allowing for financial gain from parking, shared ownership of the parking facilities could be more appealing. Alternatively, could it be of interest to implement a system where a larger part of the construction cost is included in the parking purchase price in the beginning, as the current practice, but then gradually reduce the percentage of the price as the market adjusts.

During this thesis, it has been clear that there are no available data or estimations on what the market for parking purchases looks like in Sweden today. To get a feeling of what the potential around parking purchase looks like and how large the market in Sweden is, it was important to try to calculate an estimation of the market. The way that was found to be most suitable for doing the estimation was to look at statistics from the city of Malmö, as they provided actual statistics for the number of parking purchases made each year in the municipality. Based on these numbers, it was then possible to make estimations for how large the market in the cities of Gothenburg and Stockholm are. Since the number of how many parking purchases that have been made in the city of Malmö was accessible, there was a need for one more parameter to be able to calculate a ratio, that then could be applied to the other cities. The most suitable second parameter was decided to be the number of building permits for apartments in multi-family housing. The reason for using the number of building permits in the cities, instead of for instance number of finished apartments, is because the parking purchase contract needs to be signed for the building permit to be given, thereby these two variables and numbers correspond timewise in the Swedish planning process. Numbers regarding the number of building permits could be accessed for all the cities from Statistic Sweden (SCB, n.d.). The numbers are shown in Figure 5.21.

### Number of building permits for apartments in multi-family housing

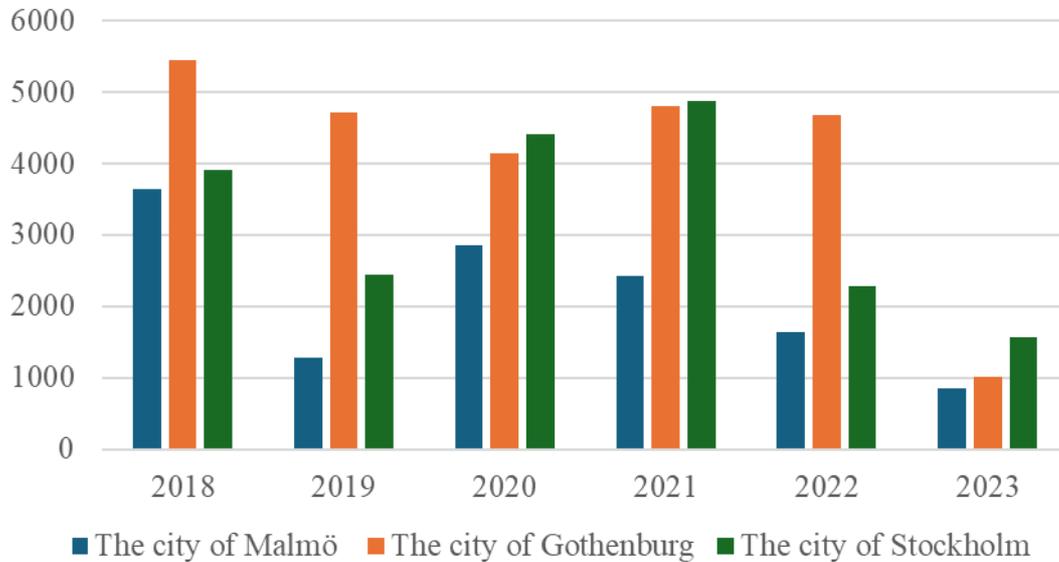
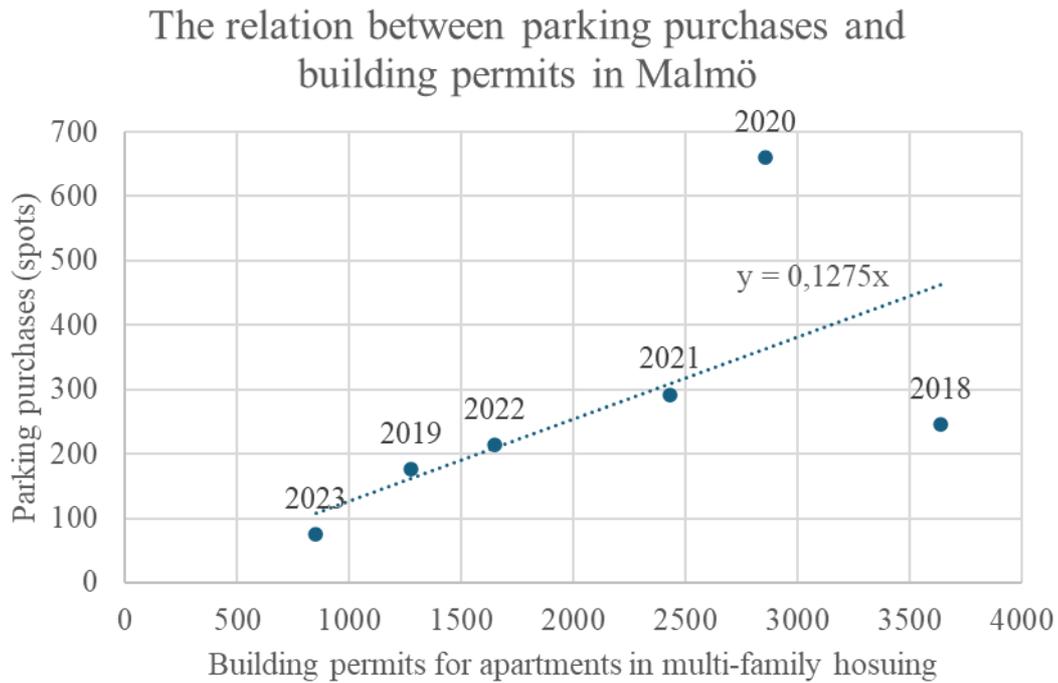


Figure 5.21 Shows the number of building permits given in Malmö, Gothenburg, and Stockholm per year between 2018-2023 (SCB, n.d.).

When the second parameter was gathered, then could the ratio between the amount of parking purchases and the amount of building permits be calculated through linear regression. The result, as seen in Figure 5.22, shows a ratio of 0,1275 parking purchases being made per building permit in the city of Malmö.



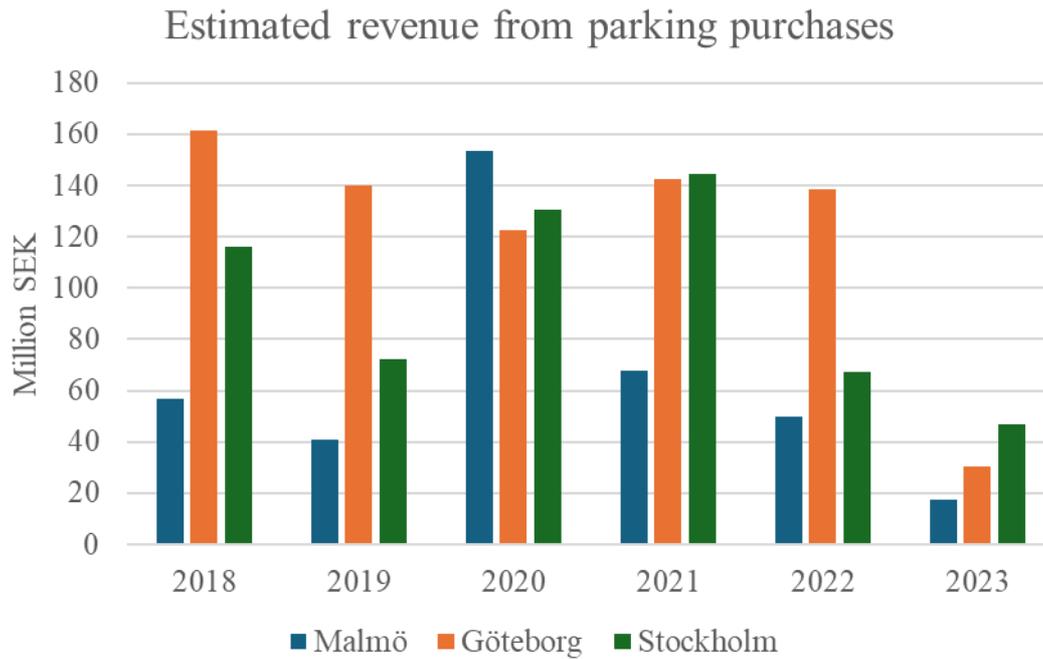
*Figure 5.22 Shows the number of parking purchases made in Malmö per year in relation to the number of building permits given for apartments in multi-family homes per year.*

The ratio from the city of Malmö could then be used to estimate the number of parking purchases made in the cities of Gothenburg and Stockholm by multiplying the ratio by the number of building permits in the cities. The result of this calculation can be seen in Figure 5.23.



*Figure 5.23 Shows the estimated number of parking purchases made per year in Gothenburg and Stockholm based on the k-value from Malmö, as well as the actual number of parking purchases made in Malmö per year.*

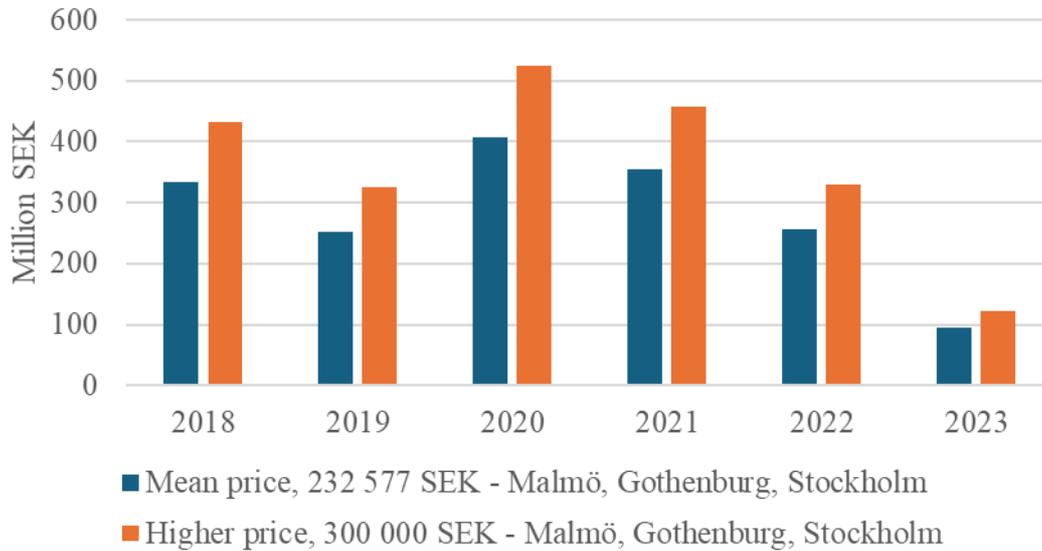
When having an estimation of how many parking purchases are made in the cities of Stockholm and Gothenburg, as well as having the real numbers from the city of Malmö, then there was a possibility to calculate an estimation of how large the market is in total revenue in the three largest cities in Sweden. To do so, the mean value of the parking purchase price at 232 577 SEK calculated from the survey, as described in Chapter 5.4.1, was used simply by multiplying it with the estimated amount of parking purchases shown in Figure 5.23. As is shown in Figure 5.24, the highest estimated revenue for the three largest cities in Sweden together was reached in 2020 with approximately 406 million SEK, and the mean value over the years was approximately 283 million SEK which is dragged down by the low numbers in 2023.



*Figure 5.24 Shows the estimated revenue of parking purchases made per year in Malmö, Gothenburg and Stockholm when using the average calculated price of parking purchase.*

Furthermore, it can be discussed that the calculated mean price of parking purchase from this thesis might be too low to represent the reality in the cities of Malmö, Gothenburg, and Stockholm. It can be seen from the example project Masthuggskajen, presented in Chapter 5.4.1, that the parking purchase price in a large new development plan in the city of Gothenburg has the price for parking purchase at 310 000 SEK. In addition, it can be seen that the price in the city of Stockholm varies between 180 000 – 463 500 SEK. If this is taken into consideration, it could be reasonable to estimate a parking price of 300 000 SEK to represent the reality in the three largest cities. In Figure 5.25, is a comparison between the estimated revenue generated by the mean price of parking purchase and the estimated revenue from the higher price shown. From this, it can be seen that the higher price gives a market revenue of approximately 525 million SEK in 2020 and a mean revenue over the years of approximately 365 million SEK. It should be noted however that these calculations are estimations done to get a grasp on the size of the parking purchase market, nevertheless, it cannot be taken as a truth. What could be said, however, is that the market for parking purchases most likely is rather large revenue-wise already, even though it is not used at a large scale yet.

### Comparison of estimated revenue from parking purchases with different pricing



*Figure 5.25 Shows a comparison between the estimated revenue of parking purchases made per year in Malmö, Gothenburg and Stockholm when using the average calculated price of parking purchase as well as a higher price.*

For the parking purchase market to fully develop would a functioning marketplace be suitable. The real estate developers and owners interviewed would in general be open to and appreciative of a marketplace if they were one. This would create clarity where there is capacity to purchase from and give private real estate owners an easier time with selling unoccupied parking spots. However, as stated by the respondents from Bonava, would this likely mean a workload for real estate actors to initially map their existing occupancy and number of parking spots. As stated in Chapter 5.5.1 regarding the mapping of parking spots are there benefits to be gained for private real estate companies from putting assets towards getting a complete picture of what resources they possess, meaning that this could be worthwhile. If their free capacity could be shared with other real estate owners in the area, does this have the possibility for increasing the already substantial market for parking purchases, utilising already built resources more efficiently, as well as becoming a currently unused source of revenue for the owners of the parking spots. The task of mapping is on the municipalities as well. As stated in Chapter 5.5.1 is there a lack of mapping of the municipally owned parking spots as well which is an inhibiting factor from a functioning parking purchase marketplace. If both municipalities and private real estate owners would share this information with each other would this further connect with what is stated in Chapter 5.5 in that there is a need for increased knowledge sharing. Resources would be used more efficiently as there would be the same need for building new parking spaces with every new development, as well as being a way of increasing the utilisation of current resources. This becomes more sustainable, both ecologically and financially.

In summary, it can be said that the market regarding shared parking and parking purchases already is quite large, meaning that there are financial incentives for

working towards an increased and well-functioning market. To reach this, there is a need for more planning on a neighbourhood level, an increased use of permit parking and shared permit parking, as well as better regulation of on-street parking. To further help the actors and to incentivise increased collaboration and sharing, a marketplace for shared parking and parking purchases is of utmost interest.

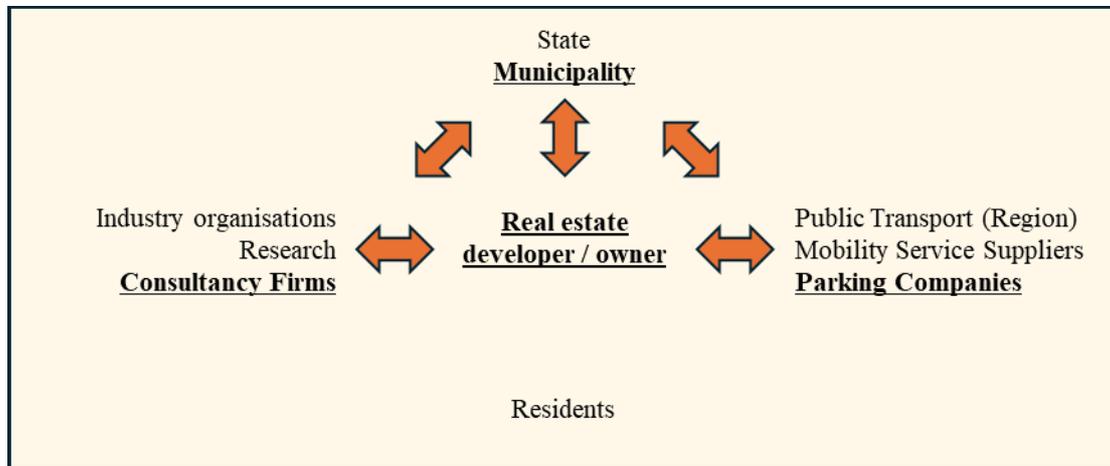


Figure 5.26 The key actors in the process of creating a market and a marketplace for shared parking, underlined and marked in bold, as well as in which directions they can promote change.

The key actors responsible for a parking purchase market are both the real estate companies and the municipalities. Real estate companies have both agency and capacity in these matters, and they need to be aware of and increase their knowledge of parking purchases. Resources should be put towards mapping and evaluating which resources they already have as well as when planning new developments considering the possibilities for utilising already built parking capacity in the surrounding neighbourhood. The municipalities also have both agency and capacity to incentivise shared parking solutions. They must however regulate the publicly owned land, try to prohibit subsidisation, and to work towards cars being parked on privately owned land regarding long-term parking. This will lead to better utilisation of parking spots that are demanded to be built because of municipal requirements, as well as leading to public space being able to be used for more value-adding features than parking. Furthermore, can the municipalities in their requirements put more focus on parking purchase, nudging developers to use it to a larger extent, as well as in larger new development areas, such as in Masthuggskajen, including it in the planning process. Both real estate companies and municipalities must cooperate and share more knowledge both within their stakeholder group as well as with each other for the parking purchase market to improve and for a wider neighbourhood perspective to work. Both actors are responsible for pushing for and influencing one another on these issues. When it comes to a marketplace for parking purchases do consultancy firms have the capacity to create and manage this, as they in general have more knowledge in these matters. They furthermore potentially have agency if they see the potential in the market for parking purchase.

### 5.7.5 Mobility market

As is described in section A have flexible parking requirements and mobility services become an increasing part of the development of housing during the last couple of years. More and more housing developments are using mobility services in some way to decrease the parking demand and increase access to mobility. Since it is a rather new phenomenon, it however still has some challenges that need to be sorted out to get a wider and more optimal use of the mobility services.

During this thesis have several thoughts and ideas been lifted regarding this. It has become clear that there is a need for more flexibility, collaboration, and increased sharing regarding mobility services. For example, can it be seen that the respondent from Stena fastigheter experiences today's system as too stiff and that there is a need for more flexibility, you should be able to scale the mobility services up and down depending on how much they are used. They do however understand that the municipality wants to have some structure, especially in the beginning to prevent the real estate developers from cutting corners. A similar thought has been highlighted by Trivector et al. (2022), which states that the lists, used by many municipalities in the planning process to control which mobility services are approved and what reduction of the parking number they lead to, become problematic since they easily become outdated and not always are suited and optimal to all projects. It is therefore important that the demands are adjustable depending on the situation and location and that the list of mobility services becomes updated based on new knowledge. The respondent from Balder furthermore states that nobody knows how the mobility industry is going to develop and it is therefore important that there is some flexibility and negotiation space in these processes. If they set a solution in the planning process, then it can be outdated and ineffective before they even finish building the house. There should be more flexibility regarding the mobility services, both during the planning process, but also during the years that the agreement is spanning over. It should be possible to have a dialogue with the municipality where the property owner presents another mobility solution instead of the one they have that might not be functioning as well as they thought.

This bridges over to another aspect of mobility services. Today, most municipalities are demanding that the mobility services should remain for at least a set number of years, often 10 years as presented earlier. What happens after that time is more unclear and municipalities are often just hoping that the market will take over after the time of agreement runs out. On the same note, the respondent from Balder states that most of their mobility services disappear after 10 years if a functioning market has not been created. In reality, are the mobility services subsidised by the property owner during the years of the agreement and even if the property owner wants mobility services in the long run, is it not reasonable to subsidise it forever. The market must be there and if it is not, then you can almost say that flexible parking requirements become some sort of greenwashing since the mobility services will not be there for the long term.

There is however not a natural law that automatically creates a market. It is therefore important to work in a way that creates and incentivises a market. According to Schnurr et al. (2021) is it not enough to work with mobility services at a property level to achieve a comprehensive mobility solution, instead the work must start at the neighbourhood level or the municipal level. A single real estate developer cannot

supply good and efficient mobility services without collaboration with other actors in the area. To work at a neighbourhood level is however something that many actors struggle with and find hard today. This is something that can be confirmed from the interviews conducted in this thesis, both the fact that actors are asking for more collaboration, as well as they find it hard today. The respondents from Bonava are for example highlighting the fact that mobility services such as carpools are best suited for usage in an open public access situation where more than just the residents on the property can use it. It would be better if more property owners could coordinate the mobility services in a shared neighbourhood setting. Furthermore, the respondent from the municipal real estate company Bostadsbolaget is lifting the fact that it would be more efficient for them to work with the market and to rent out or give out parking spots to carpool actors and to advertise about it to their tenants, instead of having to pay to have a carpool car and guaranteeing a car for each dedicated spot, which would be extremely costly. The carpool service could instead be responsible for the carpool and run it based on market conditions. In that way can the carpool also reach a larger group of their tenants and others since the carpool will be publicly open. Additionally, the respondent from Balder is lifting the fact that there are many types of mobility services in the surrounding of their properties that are market-based, such as shared electrical scooters as well as public transport, that they cannot consider as their mobility services even though they are used by their residents. It would therefore be interesting to incorporate some sort of Mobility as a service (Maas) service and card that the developers could pay for as a type of mobility service. Then you can have a larger perspective and use the market more to provide the mobility services. Mobility as a service is a wide term but could be described as a service where the user pays for a subscription and gets access to several mobility services such as public transport, carpooling, bicycle pool, rental car, and taxi (Fastighetsägarna, 2018). The use of Maas could decrease the demand for owning a personal vehicle and make large spaces at the property accessible for other uses, as well as the sharing economy creating a better utilisation of resources and improving sustainability through socioeconomical gains (Theory in practice, 2019). The use of Maas is something that the respondent from the city of Malmö is lifting as well, saying that it would be a great addition to the city's mobility offerings. It would make not owning a car more attractive and can be connected to a reduction in parking numbers for developers.

Furthermore, in the work to reach a successful use of the market and to create a long-sightedness regarding mobility services, F. Sprei highlights that the responsibility for this is laid on the real estate owners and the condominiums, leading to the question of whether they have the competence to fulfil the responsibility or not. The people working must not just know their regular work tasks but also have knowledge about the market for mobility services. Because of this, a new form of service that helps the real estate companies and the condominiums might be needed. It might be run by a consultancy firm, or another actor, however, the important thing is that it becomes a market for a service that helps the real estate owners with competence within the field of mobility. The fact that real estate owners today lack the competence to drive the shift from parking to mobility is something that Schnurr et al. (2021) are lifting as well, even though the will is there. The role Mobility broker has thereby been tested in more complex mobility situations with Maas etcetera to relieve the real estate owner from the responsibility that they do not have the competence to manage. The fact that there is a need for additional knowledge could also be seen from the interviews where for example Balder is taking in outside knowledge through hiring

mobility consultants in their projects and through the fact that all the municipal real estate companies in the city of Gothenburg, within the Framtiden group, is hiring a person responsible for driving and managing the use of mobility services forward.

In summary, it can be said that there is a need to focus more on increased follow-up and flexibility regarding the mobility agreements, focus on increased sharing and collaboration, as well as increasing competence in the area, to reach a more well-functioning market for mobility services.

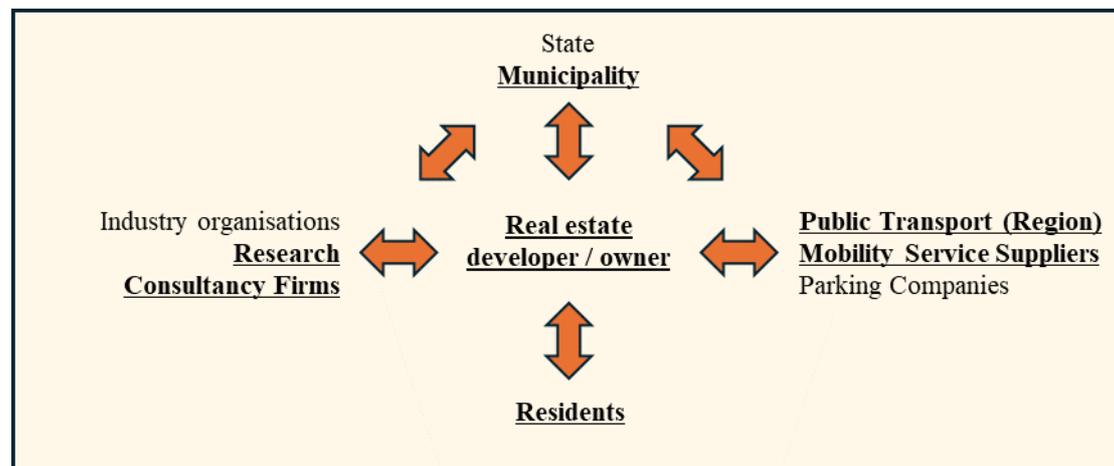


Figure 5.27 The key actors in the process of creating a mobility market, underlined and marked in bold, as well as in which directions they can promote change.

As can be seen in Figure 5.27, there are many stakeholders included in the matter of creating a functioning market for mobility. One of the key stakeholders, the municipalities, has both the agency and the capacity to change the regulations and requirements regarding mobility in new developments to reach more flexibility and market-based solutions. Furthermore, the real estate developers have agency, both through wanting to create better solutions for their residents and through financial incentives. Additionally, they have some capacity through their possibility to use the municipal requirements to the fullest, as well as through putting pressure on the municipalities. They do however sometimes lack competence in these matters, leading to their capacity becoming lower. To prevent this, consultancy firms have the agency and capacity to support real estate developers with knowledge and evidence regarding mobility. The researchers furthermore have the possibility to spread knowledge about the effects the different stakeholders' decisions are getting. Furthermore, going towards market-based mobility solutions, both the public transport authorities and the mobility service suppliers have both agency and capacity to create sustainable mobility solutions that can be shared and used on market conditions. Their collaboration with the real estate developers and the municipalities is also of utmost importance to coordinate and gather mobility solutions in a neighbourhood or the city. The residents have agency in the question since they want access to good mobility, however, communication with the real estate developers and evaluation is important to find effective mobility services.

## 5.8 Making change happen

As discussed throughout Section B, there is a need for several improvements and changes in the current management of parking and mobility for it to become more sustainable and efficient. How this can be reached and which stakeholders have agency and capacity in each matter has been described. In addition to this, however, there are some general themes over how change can be achieved and sustained in the industry overall. These factors will be discussed further in this chapter.

During this thesis, it has been rather clear that the management of parking and mobility is a sensitive matter that brings up feelings on all levels, from the political level to the individual residents. With this sensitivity, the fear of making sensitive decisions rises as people in general are comfortable with the parking situation as it is today, and changing can as mentioned throughout this thesis cause controversies with some people resisting change. As mentioned in previous chapters, decisions must be based on evidence in these politically sensitive matters, otherwise is it not worth considering them in the first place. Basing decisions on evidence and what is proven to work is a way of overcoming resistance in the strive for reaching a more sustainably managed parking and mobility market. Furthermore, taking inspiration from change management and Kotter's eight-step model for change, can it be seen that the first step in managing change is to create a sense of urgency (Hallin et al., 2021). A sense of urgency in these matters is to spread the view that something needs to change regarding parking and mobility to be able to achieve a more sustainable future. The municipalities need to establish this sense of urgency, both within the respective organisation so that the whole municipality is working in the same direction, as well as communicating it and establishing the picture with the general public to reduce the resistance. The same is applicable in other organisations as well for initiating and driving the change.

In line with the framework presented is the municipalities not the only party responsible for making the change happen. The change can and needs to be driven by different stakeholders, and the whole network does not change if the individual actors do not. The management of different organisations needs to identify what needs to change and formalise strategies for how to work moving forward. A recognised strategy to drive the work with what has been decided in change efforts is to identify and appoint champions to lead this work (Lozano, 2024). Such measures have as mentioned been implemented by a few real estate companies, where they have formalised goals and strategies regarding how the mobility development and the management of parking will be managed more sustainably moving forward. Some of these companies have appointed an employee responsible for driving the work and coordinating the efforts in implementing the strategies and reaching the company's vision. On the same note, has it been identified that in the case of the municipalities, the work with parking and mobility is divided between different municipal departments, with no one having overarching responsibility for coordinating the work. Both municipalities and real estate companies would benefit from taking the approach of having champions in the work and coordinating efforts in the work going forward. As mentioned throughout this thesis, there is a lot of guessing and relying on old norms when making decisions regarding these matters. Basing decisions on evidence, establishing proper strategies, and supporting individuals in driving the work is of

essence in the work ahead. Individuals leading the work need to feel that they have support in their work and change efforts.

Furthermore, there is a lack of collaboration regarding these matters. A general trend from the interviews is that respondents state that another party should change the way they work or set different demands, these opinions are however too rarely communicated to the other party. The work concerning these issues needs to become more collaborative to overcome the discrepancies in opinions. The communication between parties needs to increase, something that is further underlined as being of the essence in change management literature (Hallin et al., 2021). It is hard to change when one does not know the reasoning behind the other involved stakeholders' motivations and opinions of what should be changed. Moving forward will be crucial to create a joint development and involve parties with different angles of inclination and interests to find the most sustainable solutions moving forward.

As mentioned by the consultant P. Bergström Jonsson are consultants an important party to involve in this work as well. Consultancy firms can provide expert knowledge gathered from different municipalities and companies and refer to what has worked in other organisations and cities previously. In connection to this, as well as mentioned previously in this thesis, he states that it is harder for smaller municipalities to allow for more flexible solutions and be innovative in their requirements. This tends to be more resource-demanding and they are in general looking towards the larger cities for inspiration. For making change happen nationwide will it be important that larger municipalities lead the way moving forward as this will trickle down to smaller municipalities. As mentioned, can SALAR work even more as a forum for collaboration between municipalities. Involving other forums and industry organisations, engaging real estate companies and other parties as well will be important moving forward to bring up the questions' relevancy even more, connecting back to creating a sense of urgency.

To summarise, to make change happen it is important to be tough and forward-thinking in decisions, establish a sense of urgency that change needs to happen, appoint and support champions that can coordinate change efforts, as well as increase collaboration, within and between, all involved stakeholders for making change happen together and enabling a joint development moving forward.

## 6 Conclusion

To conclude and connect back to this thesis's aim and research questions, looking at RQ1 about how parking is managed in Swedish municipalities today, parking is managed at a municipal level in Sweden through the planning monopoly while there are national laws that set the boundaries for how municipalities can regulate the supply of parking. The important legislations discussed in this thesis connected to parking and mobility are the Planning and Building Act (PBL) and the Municipal Fees Act (KAL). The most common way municipalities govern parking is with minimum parking requirements, which is a way to interpret and fulfil the demands set in the PBL. The use of flexible parking requirements is becoming more common in the country, as a way for real estate companies to lower the minimum parking number based on the type of project and location, as well as by reducing the demand for parking by supplying alternative mobility services. Supplying the parking demand on the respective property is the norm in Sweden today. There are however good possibilities to supply parking outside of the property in question in shared parking facilities.

Looking at RQ2 regarding how the management of parking affects the process of development and building of new housing in Sweden, parking is a considerable part of the total construction cost in new developments, what the cost becomes is a balancing act of different factors. The municipal demands impact how developments are designed and carried out, and the financial aspect of them. The surrounding parking situation does impact what the occupancy looks like in parking facilities on privately owned land. Furthermore, it should be stated that parking most often does not cover its own cost, leading to all residents subsidising parking for car users.

To answer RQ3 about which barriers and enablers stakeholders identify for promoting sustainable parking management, and who the key actors in promoting change are, it can be seen that there is a need for more evidence-based decision-making. It is important to understand the actual legal possibilities for change, rather than the law's common interpretation, as there is more legal room than what is commonly thought in both the PBL and KAL. This enables stakeholders to take tougher and forward-looking decisions, planning for the future cities we want, rather than for the current situation. Municipalities need tougher regulation of parking on publicly owned land to avoid the move of cars from privately owned land to the streets, ensuring better financial situations for parking facilities. Furthermore, they must allow for more flexibility, focusing on solving the parking and mobility situation on a neighbourhood level rather than on a property level, as well as nudge the developers to make more sustainable decisions. It is the other way around as well; real estate companies must push the municipalities in that they want to work differently, and they must increase their knowledge about the benefits of shared parking and mobility. Researchers and consultants can push both municipalities and real estate companies to base their decisions on evidence rather than old norms. Furthermore, increased collaboration between stakeholders is needed and all actors have important roles in creating a joint development towards a more functioning and sustainably managed parking and mobility market.

## 7 Future research

As stated in this thesis there is a lot to be done in matters related to parking and mobility in Sweden. This thesis adds to the current body of knowledge but highlights areas where more emphasis needs to be put in future research for a more sustainable management of parking and mobility moving forward. Some of the areas identified are firstly to further investigate how different mobility services correspond to a reduction in parking demand. This will be important as the use of mobility services likely will increase in the future and replace part of the car use, in this will it be of essence to know more scientifically how large of a reduction different mobility services should give, as it today is based on a lot of qualified guesses. Secondly, it will be needed to further evaluate the legal room connected to these issues, both concerning the Municipal Fees Act (KAL) to establish how municipalities can and should work in regulating parking on publicly owned land, as well as concerning the Planning and Building Act (PBL) and how flexible the municipalities can be in allowing for more flexible solutions and lower parking numbers. Furthermore, it will be important to evaluate the effect that a separation of the parking and mobility market from the housing market would have. Today they are closely connected, if the markets become more functioning as proposed in this thesis, a separation is possible. The effects this will have on the parking and mobility availability and the pricing of them etcetera will be crucial to investigate. These are some important examples to name a few, there are however more that needs to be done as a lot of decisions today as mentioned are based on old norms. Basing decisions on science, the actual legal room and what is proven to work is of the essence moving forward.

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# Appendix A

## Enkätundersökning Parkeringshantering och p-köp i svenska kommuner

Hej,

Tack för att du tar dig tid och vill svara på denna enkät! Enkäten beräknas ta cirka 10 minuter att genomföra.

Enkäten är en del av ett examensarbete som genomförs av Erik Andersson och Oscar Prytz inom sektionen för Arkitektur och Samhällsbyggnadsteknik vid Chalmers tekniska högskola, samt i samarbete med Urbanivation. Målet med arbetet är att utreda hur parkering kan hanteras på mer hållbara sätt vid nybyggnation av fastigheter. Enkätens syfte är att sammanställa hur svenska kommuner arbetar med parkeringar i form av parkeringsnormer, flexibla p-tal och p-köp. Handledare till examensarbetet är Janneke van der Leer, doktorand vid sektionen för Arkitektur och Samhällsbyggnadsteknik, epost: [janneke.vanderleer@chalmers.se](mailto:janneke.vanderleer@chalmers.se)

Enkäten består av två delar, den första mer allmän kring kommunens hantering av parkeringar vid nybyggnation av fastigheter, den andra mer inriktad mot p-köp specifikt.

Vid frågor gällande enkäten eller arbetet i stort, vänligen kontakta:

Erik Andersson  
[eriane@chalmers.se](mailto:eriane@chalmers.se)  
Oscar Prytz  
[oscarpr@chalmers.se](mailto:oscarpr@chalmers.se)

\* Obligatoriskt

## Samtycke till insamling av personuppgifter

1. Jag samtycker till att mina personuppgifter i form av för- och efternamn, titel, e-postadress och telefonnummer (frivilligt att lämna) får behandlas av Chalmers tekniska högskola för studien:

Examensarbete som genomförs av Erik Andersson och Oscar Prytz inom sektionen för Arkitektur och Samhällsbyggnadsteknik vid Chalmers tekniska högskola. Målet med arbetet är att utreda hur parkering kan hanteras på mer hållbara sätt vid nybyggnation av fastigheter. Enkätens syfte är att sammanställa hur svenska kommuner arbetar med parkeringar i form av parkeringsnormer, flexibla p-tal och p-köp.

### Information

Personuppgifterna kommer att hanteras på följande sätt:

Lagring av personuppgifter kommer att ske under arbetets gång och tas bort efter avslutat projekt. Övriga svar kommer att bevaras med koppling till respektive kommun men utan koppling till personuppgifter. Personuppgifter kan komma att delas med Urbanivation fram till arbetets avslutande och tas bort efter i enlighet med ovan.

Ditt samtycke gäller tills vidare. Du har rätt att när som helst ta tillbaka ditt samtycke. Detta gör du genom att kontakta [oscarpr@chalmers.se](mailto:oscarpr@chalmers.se) eller [registrator@chalmers.se](mailto:registrator@chalmers.se). Om du återkallar ditt samtycke kommer vi upphöra att behandla personuppgifter vi samlat in med stöd i ditt samtycke. Vissa uppgifter kan komma att sparas pga. Chalmers skyldigheter enligt svensk arkivlagstiftning.

Chalmers tekniska högskola, 412 96 Göteborg, med org. nr 556479-5598 är personuppgiftsansvarig. Du hittar Chalmers integritetspolicy på [www.chalmers.se](http://www.chalmers.se).

Som registrerad har du rätt att få information om hur dina personuppgifter behandlas. Du har rätt att få felaktiga uppgifter rättade, överflödiga uppgifter raderade, begära att behandlingen begränsas och uppgifter överförda till en annan aktör. Du har även rätt att lämna klagomål till Integritetsskyddsmyndigheten (IMY). Har du frågor rörande Chalmers behandlingar av personuppgifter kan du kontakta Chalmers dataskyddsombud på [dataskydd@chalmers.se](mailto:dataskydd@chalmers.se). \*

- Jag samtycker till att Chalmers tekniska högskola behandlar personuppgifter om mig i enlighet med ovanstående.

## Allmän info om parkeringshantering i kommunen

2. Vilken kommun är svaren kopplade till? \*

3. Vad är din roll på kommunen?

4. Använder ni er av en parkeringsnorm eller parkeringspolicy som stöd i detaljplanearbetet?

Ja

Nej

5. Har ni kartlagt hur många parkeringar som finns i kommunen?

Ja

Nej

6. Används boendeparkering i kommunen?

Ja

Nej

7. Använder ni några verktyg som stöd vid hantering av parkeringsfrågan vid bygglovsprocessen? Om ja, ge gärna exempel.

8. Använder ni er av flexibla/gröna p-tal?

Ja

Nej

9. Hur informeras det om flexibla/gröna p-tal?

- Marknadsförs av kommunen som ett förslag i bygglovsskedet
- Information finns tillgänglig, specifik marknadsföring görs ej
- Ingen information finns tillgänglig

10. Ungefär hur många projekt utnyttjar flexibla/gröna p-tal vid bygglovsprocessen årligen? Vid exakt siffra, ange den under alternativ "Annat".

- Inga
- 1-5
- 6-10
- 11-15
- 16-20
- 21-25
- 26-30
- 31-35
- 36-40
- 41-45
- 46-50
- 50+
- Annat

11. Hur ser trenden ut för användningen av flexibla/gröna p-tal?

- Ökat mycket
- Ökat något
- Oförändrat
- Minskat något
- Minskat mycket

12. Används p-köp i kommunen? \*

- Ja
- Nej

## P-köp

13. Mellan vilka aktörer tillåts p-köp?

- Mellan kommun och privat aktör
- Mellan två privata aktörer
- Båda
- Annat

14. Hur informeras det om p-köp?

- Marknadsförs av kommunen som ett förslag i bygglovsskedet
- Information finns tillgänglig, specifik marknadsföring görs ej
- Ingen information finns tillgänglig

15. Hur långt sträcker sig ett avtal om p-köp?

- 25 år
- Annat

16. Vad är priset för en parkeringsplats vid p-köp?

17. Vad baseras priset på?

18. Skiljer sig priset beroende på typ av parkering och geografisk plats?

19. Vilken prissättningsmodell används vid p-köp?

- Engångsbelopp
- Hyra (Kontinuerlig betalning)
- Engångsbelopp och hyra
- Annat

20. Ungefär hur många projekt utnyttjar p-köp vid bygglovsprocessen årligen? Vid exakt siffra, ange den under alternativ "Annat".

- Inga
- 1-5
- 6-10
- 11-15
- 16-20
- 21-25
- 26-30
- 31-35
- 36-40
- 41-45
- 46-50
- 50+
- Annat

21. Ungefär hur många p-platser hanteras med p-köp per år i er kommun? Vid exakt siffra, ange den under alternativ "Annat".

- Inga
- 1-25
- 26-50
- 51-75
- 76-100
- 101-125
- 126-150
- 151-175
- 176-200
- 200+
- Annat

22. Hur ser trenden ut för användningen av p-köp?

- Ökat mycket
- Ökat något
- Oförändrat
- Minskat något
- Minskat mycket

23. Är det något som inte tagits upp i enkäten som du vill tillägga?

24. Om intresse finns för att ta del av slutresultatet av arbetet eller om du kan tänka dig att ställa upp på eventuella följdfrågor, vänligen lämna dina kontaktuppgifter här nedan.

## P-köp

25. Varför har p-köp inte varit aktuellt?

26. Är det något som kan bli aktuellt i framtiden?

27. Är det något som inte tagits upp i enkäten som du vill tillägga?

28. Om intresse finns för att ta del av slutresultatet av arbetet eller om du kan tänka dig att ställa upp på eventuella följdfrågor, vänligen lämna dina kontaktuppgifter här nedan.

---

Det här innehållet har inte skapats och stöds inte av Microsoft. Data du skickar kommer att skickas till formulärets ägare.

 Microsoft Forms

# Appendix B

## Intervjuguide

**Tack för att du vill ställa upp på denna intervju!**

Intervjun är en del av ett examensarbete som genomförs av Erik Andersson och Oscar Prytz inom sektionen för Arkitektur och Samhällsbyggnadsteknik vid Chalmers tekniska högskola, samt i samarbete med Urbanivation. Målet med arbetet är att utreda hur parkering kan hanteras på mer hållbara sätt vid nybyggnation av bostäder. I arbetet utreds hur kommuner och fastighetsutvecklare exempelvis arbetar med parkeringsnormer, flexibla p-tal och p-köp. Handledare till examensarbetet är Janneke van der Leer, doktorand vid avdelning Byggnadsdesign, epost: [janneke.vanderleer@chalmers.se](mailto:janneke.vanderleer@chalmers.se)

Målet med intervjuerna är att skapa en bättre förståelse för hur olika parter arbetar med parkering och mobilitet i utvecklingen av nya bostäder, vilka reflektioner det medfört och vad de tror om framtiden.

Citat och referenser från intervjuerna kommer att användas i examensarbetet som en del i att beskriva respektive parts syn och åsikter i frågorna. Vid citering kommer exakt citat att dubbelkollas och godkännas med berörd person innan publicering av arbetet sker. Vid efterfrågan kan även refereringar stämmas av innan publicering.

Vid referering i arbetet kommer titel samt företag, alternativt bara företag att nämnas som källa. Namn på intervjuperson kommer endast att anges efter överenskommelse. Detta är dock ett krav vid citering.

Genom att delta i denna intervju godkänner du att intervjuinnehållet får användas i ovanstående arbete. Arbetet och dess innehåll kommer att publiceras och bli offentligt. En kortare och mer visuell version av arbetet kan även komma att skapas för lättare marknadsföring av arbetets slutsatser. Även denna kommer i så fall bli offentlig. Vid ånger om samtycke att bidra i arbetet, vänligen kontakta oss.

### GDPR

Behandlingen av personuppgifter beskrivs mer ingående i det bifogade dokumentet: *Samtycke och information om behandling av personuppgifter i studentarbete*. Detta dokument behöver skrivas på i samband med intervjun.

### Kontaktuppgifter

Erik Andersson, [eriane@chalmers.se](mailto:eriane@chalmers.se)

Oscar Prytz, [oscarpr@chalmers.se](mailto:oscarpr@chalmers.se)

# CHALMERS

## Samtycke och information om behandling av personuppgifter i studentarbete

Jag samtycker till att mina personuppgifter i form av för- och efternamn, e-postadress, telefonnummer och ljud-/videoupptagning får behandlas av Chalmers tekniska högskola för studien:

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### Information

Personuppgifterna kommer att hanteras på följande sätt:

Personuppgifter i form av ljud-/videoupptagning, e-postadress och telefonnummer kommer att lagras under arbetets gång och tas bort efter avslutat projekt. Transkribering av ljud-/videoupptagning samt för- och efternamn kommer att sparas även efter arbetets slut. Personuppgifter kan komma att delas med Urbanivation fram till arbetets avslutande och tas bort efter i enlighet med ovan.

Ditt samtycke gäller tills vidare. Du har rätt att när som helst ta tillbaka ditt samtycke. Detta gör du genom att kontakta antingen [oscarpr@chalmers.se](mailto:oscarpr@chalmers.se) eller [registrator@chalmers.se](mailto:registrator@chalmers.se). Om du återkallar ditt samtycke kommer vi upphöra att behandla personuppgifter vi samlat in med stöd i ditt samtycke. Vissa uppgifter kan komma att sparas pga. Chalmers skyldigheter enligt svensk arkivlagstiftning.

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Jag samtycker till att Chalmers tekniska högskola behandlar personuppgifter om mig i enlighet med ovanstående.

Ort	Underskrift
Datum	Namnförtydligande

DEPARTMENT OF ARCHITECTURE AND CIVIL ENGINEERING  
DIVISION OF BUILDING DESIGN  
CHALMERS UNIVERSITY OF TECHNOLOGY  
Gothenburg, Sweden 2024  
[www.chalmers.se](http://www.chalmers.se)



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