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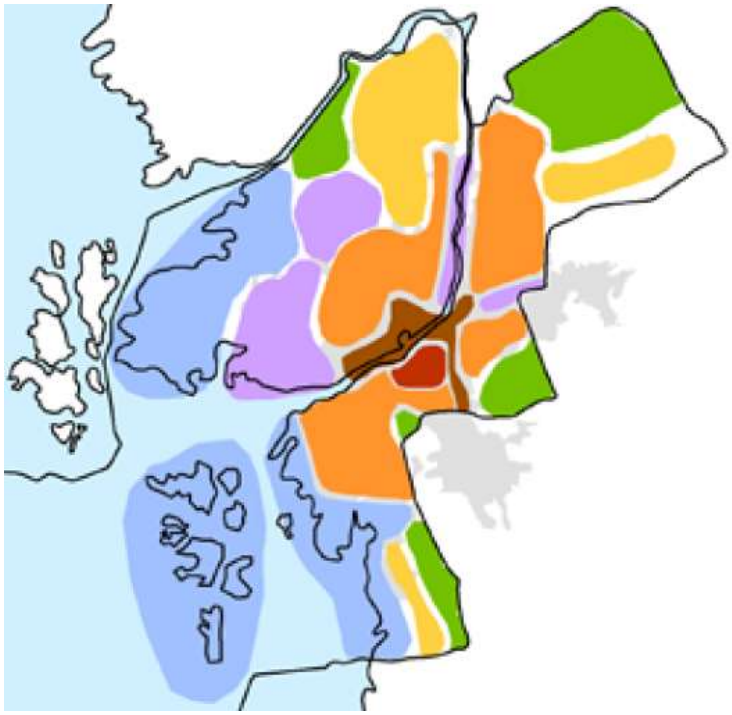

Urban densification

A case study of exploitation possibilities at preschools in Östra Göteborg

Master's thesis in Master's programme Infrastructure and environmental engineering

JONNA SAMUELSSON

Department of Architecture and Civil Engineering
CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 2020

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Cover: Illustration of Gothenburg and the intermediate parts of the city.

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Abstract

Urban population is increasing and it is important to create sustainable cities (Lehmann 2016). A way of doing that is to densify and create more compact cities and the education system is an important aspect when doing so. In Gothenburg, the population is increasing rapidly and the demand for preschool places will increase from 2020-2025 (Göteborg stad 2020). This thesis is conducted in cooperation with Lokalförvaltningen at Göteborgs Stad to investigate the exploitations possibilities of preschools in Östra Göteborg. The aim of this thesis is to investigate if there are potential to develop preschools within the current detailed development plans. It is also to investigate how much of the upcoming demand of preschools can be fulfilled without making new plans. This thesis focuses on development potential based on surface and open space and does not consider other aspects such as managing costs or building year.

To avoid early interpretations, an excel template with quantitative measures was used to investigate current preschools. The development potential was then based on these measures. The results show that there is potential to develop within current detailed plans. In Östra Götbeorg, 15 % of the preschools have potential to develop. This study has been completed to give an indication to what objects can be developed. For further research this study can be used as a base. Other aspects such as energy consumption, building year and managing costs together with location of the preschool is suggested to investigate to get a clear picture of which preschools could be developed.

Key words: Densification, compact cities, exploitation possibilities, preschools, open space

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Notations

Göteborgs Stad: The municipality in Gothenburg

Lokalförvaltningen: The department in Göteborgs Stad that manages and builds new public services in the city such as preschools, schools, nursing homes and housing for people with special needs.

Östra Göteborg: A district in the eastern part of Gothenburg and is a part of the intermediate city

BTA (Bruttoarea): Area of all floors measured including the outer walls.

BYA (Byggnadsarea): Area that a building occupies on the ground.

Development rights: The area within a detailed development plan where building is approved in the plan.

1 Introduction

Densification is a subject that is highly discussed all over the world (Berghauser Pont & Haupt 2009). In many cities densification is planned or already ongoing and it is needed as the population is increasing. The prognosis of the urban population increase in the world is estimated to 6,3 billions in 2050, which is almost twice as much as 3,5 billions that was the urban population in 2010 (Khoshkar, Balfors & Wärnbäck 2017). The growth of population will affect the land use and natural resources of cities. Densifying areas could be an approach to create sustainable solutions and accomplish high quality cities (Rerat 2012).

When talking about densification it is not only buildings for people to live in that needs to be discussed (Lehmann 2016, Boverket 2017). When building houses and apartments it is also important to plan for public services and to consider the environment and quality of the city. A city needs to be comfortable for everyone, and people need to feel safe. To create sustainable dense cities, enough green space and attractive landscape is important to maintain high quality (Khoshkar, Balfors & Wärnbäck 2017).

Gothenburg is facing a future where schools, preschools, nursing homes and other public services need to be increased at the same rate as homes are being built (Göteborgs stad 2020). Planning these projects takes time, and it is therefore important that these services are planned at the same time cities become more dense. A challenge with dense cities is to implement this (Lehmann 2016, Boverket 2017). To be able to build enough housing and at the same time provide enough public services, such as schools, is a challenge by itself. At the same time, creating a satisfactory city with enough vegetation and green space to establish a comfortable environment for the residents is not easy but important when discussing sustainable densification (Arnberger 2012). To be able to keep up with building of housing and public services, it is vital that the planning process is effective.

1.1 Background

This thesis is conducted in cooperation with Lokalförvaltningen at Göteborgs stad to investigate the impact densification has on the demand of preschool places and if it is possible to find places to build without creating new detailed development plans.

Lokalförvaltningen is a department at Göteborgs Stad and is providing and managing public service facilities in Gothenburg (Göteborgs Stad 2020). Lokalförvaltningen consists of three different departments: Service-, Management- and project department and is a part of all steps throughout the planning process, from early planning stages to construction and then managing of the buildings. Their main focus is schools, preschools, housing with special service and nursing homes. The projects

are both building new facilities but also renovations on current buildings and projects where premises are rented.

The planning process to build new facilities takes time and it is therefore interesting to see if it is possible to improve the planning process when constructing new buildings. When building new facilities, new detailed development plans are often needed and making new plans takes time and is expensive (Joklint, Öberg 2020). It is therefore interesting to investigate if it could be possible to shorten the process by eliminating some parts of the process. If current detailed plans could be used more effectively, new facilities could be built or developed without spending time on creating new plans. If this is possible in Gothenburg, the city could profit from this method both considering time and economy.

The amount of places where it will be possible to build in the future will decrease as more homes are being built (Göteborgs Stad kommunstyrelsen 2020). It is therefore more important than ever to use the existing space as effectively as possible and at the same time also densifying the city in a sustainable way. In some places in Gothenburg, old preschools are located in areas where the detailed development plans permit more to be built. If these places can be used more effectively, some of the increased demand of preschools may be fulfilled. The planning process of constructing new buildings consists of different steps seen in figure 1 below.

Figure 1. Shows the step in the planning process when creating

If a new detailed development plan is needed, the plan needs to final before starting the production of new buildings. The making of new plans is happening during the two first steps in figure 1 above. If it is possible to build without making new plans, the first two steps in the planning process can be shortened and the total time can be reduced. The planning process when using already existing plans is shown in figure 2.

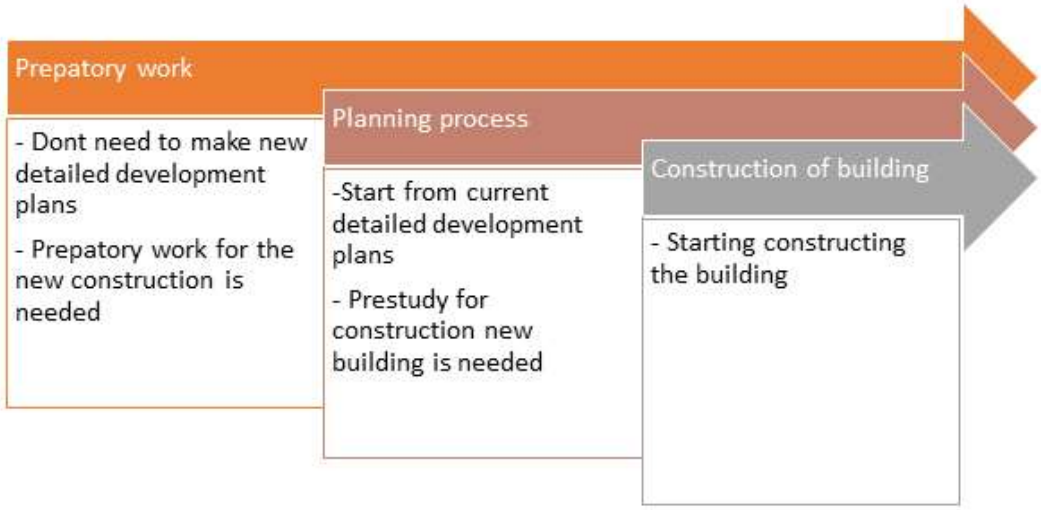

Figure 2. The planning process if using already existing detailed development plans.

Making a new detailed development plan takes about 2-4 years depending on appeals and the configuration of the plans (Öberg 2020). New plans are also expensive and cost can be decreased if old plans can be used instead. The cost of building will also increase annually, the production cost increased 35 % from 2016 to 2018 (Göteborgs Stad kommunstyrelsen 2020). If it is possible to build without making new plans, 2-4 years can be saved which will lead to lower production cost and possibilities to faster fulfil the upcoming demand of preschool places.

1.2 Aim and Objectives

The aim of this thesis is to investigate sustainable densification and the impact of urban planning in Östra Göteborg. It is also to examine to what extent densification is planned in these areas and how this will affect the demand of preschool places.

Further, the aim is to investigate the development possibilities within the current detailed development plans in Östra Göteborg and if there are sites where preschools can be developed without creating new plans. To build without creating new plans saves time and decreases costs and the thesis also aims to see how much of the demand of preschool places can be fulfilled within current detailed plans.

1.3 Research questions

- Is densification impacting the demand of new preschools in Östra Göteborg?
- Is it possible to build new preschools without changing current detailed development plans?
- How much of the upcoming demand of preschools can be fulfilled using current detailed plans?

1.4 Limitations

In this thesis, preschools in Östra Göteborg will be investigated. Only sites with preschools will be examined and not all public services that are provided and managed by Lokalförvaltningen. Only preschools owned by Göteborgs Stad will be considered and not private preschools or rented in other premises.

The study will focus on the demand of preschool places from 2020-2025. When analyzing the objects, the surface and the potential to increase the capacity of the preschools would be the main focus when determining what potential to develop the preschools have. Other aspects such as age of the building, energy cost or if the building is newly renovated is not considered in this thesis.

2 Case study

The city of Gothenburg is planning on increasing the population with 150000 inhabitants by the year of 2035 (Stadsutveckling Göteborg 2019). To keep up with the increased population, 8000 new buildings for work and living are planned.

2.1 Developing Östra Göteborg

Östra Göteborg is a district in the eastern part of Gothenburg where population is increasing. Approximately 50000 people are currently living here, but the prognosis is that this number will increase in the upcoming years (Statistik Göteborg 2020). A comprehensive plan and a development strategy for Gothenburg has been developed and the different parts of the city have been divided into different categories of prioritization (Göteborgs Stad 2014). Östra Götborg is a part of the intermediate city and the location can be seen in figure 3 below. In the intermediate city the plan is to densify the city and develop close to infrastructure to connect the intermediate city with the city core. The program has been developed to increase the quality of the intermediate city and Östra Göteborg is one of the areas of prioritization.

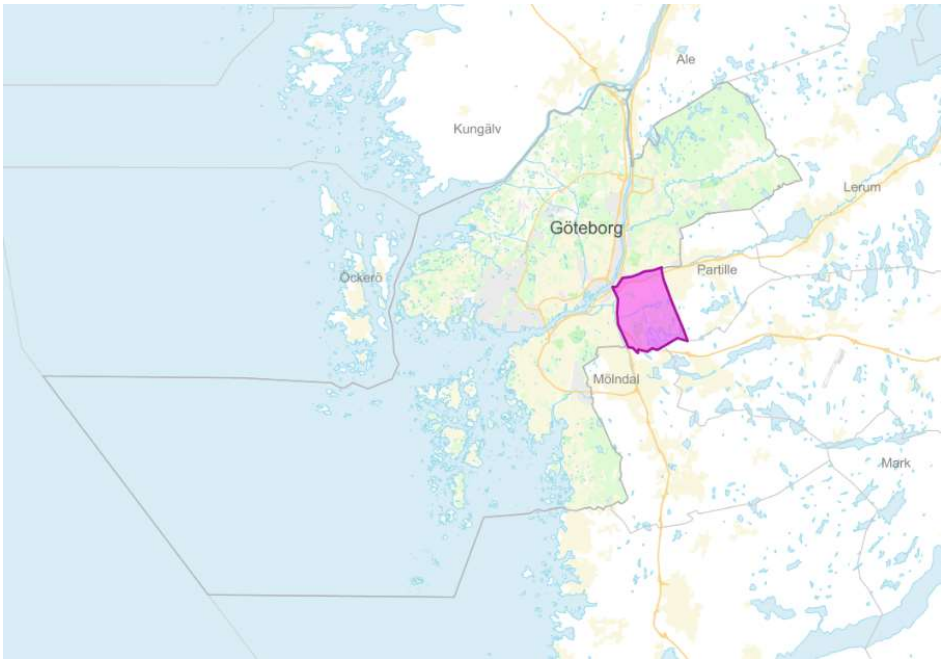

Figure 3. The district Östra Göteborg is the marked area. (Picture taken from GOkart)

Östra göteborg has the potential to grow because it has an infrastructure system that is good enough to develop around. Densification in these areas can help with perceived quality for the people living there. A more dense area creates more services, such as

schools, and housing and makes it easier for people to move here and also increases the quality for the inhabitants.

2.2 Preschools

When the population is increasing, the demand of new preschool places will also increase (Göteborgs Stad kommunstyrelsen 2020). In figure 4 the prognosis of increase of children in the age of 1-5 years is described. As seen in the figure, the prognosed population in this age is continuing increasing until 2025.

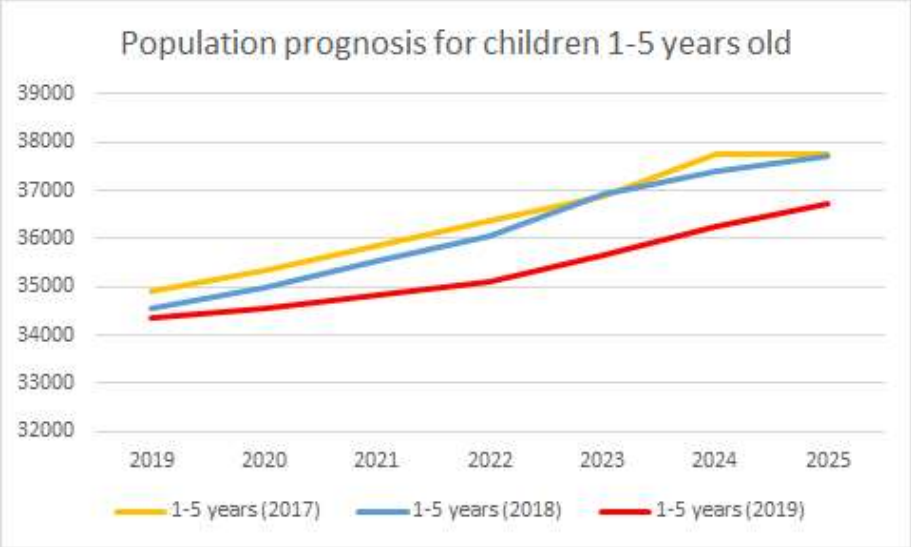

Figure 4. Population prognosis for children 1-5 years from 2019 to 2025. (Based on LFP prognosis).

The city of Gothenburg also made a prognosis of the demand of preschool places needed between 2020 and 2025 (Göteborgs Stad kommunstyrelsen 2020). The prognosis is based on the population growth and calculated for the different districts in Gothenburg. The calculations are based on the assumption that there are 0,5 children in every household and that ⅓ of these are children in need of preschools.

Table 1. Demand of preschool places is Östra Göteborg based on LFP. (Göteborgs Stad kommunstyrelsen 2020)

	2020	**2021**	**2022**	**2023**	**2024**	**2025**
Östra Göteborg	108	306	-36	72	126	198

In Östra Göteborg there are 40 preschools that are owned and managed by the municipality (Göteborg Stad 2020). These preschool places will not be enough in the

upcoming years and the number of places needs to increase at the same rate as the population is growing. In table 1 the demand of preschools within the upcoming years is described. In total there will be a demand of 774 new preschool places by 2025.

3 Theory

In this section, theories of concepts important for the thesis will be covered. Urban densification, models of urban planning, regulations and strategies used in Gothenburg will be further explained.

3.1 Urban densification

Urbanization is connected to the modern city and how the cities will develop in the future (Berghauser Pont, Haupt 2009). Two important concepts when discussing modern urbanization is densification and compactness. Lehmann (2016) means that these concepts are closely connected and also desirable in a modern city, as long as they are in balance. Too much density may create a city that is not attractive and welcoming. Lehmann (2016) mentions that diversity is also needed to create a modern city and an important question to ask is: "how dense should a city be?".

Densification is a concept that has been widely known during the last years and building the city inwards is now popular in urban planning (Lehmann 2016, Boverket 2017). When densifying inwards it is possible to use the existing land more effectively instead of using land in the outside areas of the city (Boverket 2017). When building inwards there will also increase availability and make it easier for people to transport between homes and work without being dependent on cars. The concept of dense cities have different meanings and can depend on residential density, population, building height, number of buildings and how spacious the city is (Berghauser Pont, Haupt, 2009, Lehmann 2016).

Population density: A measurement of the number of people in the city (Berghauser Pont, Haupt, 2009, Lehmann 2016). This measurement can be used to calculate for new pre schools and facilities and covers the population increase and not only the amount of dwellings in the city.

***Land use intensity/ Floor area ratio*:** A measurement of the total floor area of all buildings in the city divided by the site where the buildings are being built. This measurement shows a ratio between density on the land being used (Berghauser Pont, Haupt 2009, Lehmann 2016). The ratio does not consider the usage of the buildings but includes all floor space. This measurement is used as a regulation in urban planning to limit the number of buildings in a city.

Open space ratio/ Spaciousness: Measurement of the spaciousness in a city is the ratio between the total floor area and the open space. This measure was produced to create enough open space in a certain area (Berghauser Pont, Haupt 2009).

These measures are important in different ways and may apply differently depending on the construction of the city. The measures alone may not contribute to sustainable dense cities, but used together they can help understanding the important factors when planning urban areas (Berghauser Pont, Haupt 2009).

3.2 Compact cities

The definition of a compact city differs and has different meaning in different contexts (Cereda 2009). The model was created to decrease the number of people moving out from the city. Cereda (2009) means that many countries adopted the model to be able to decrease the impact of the environment. This has become a sustainable way to develop. The concept of dense cities often refers to different processes that will make the area more compact. The closeness of public transportation, public services and the fact that people have walking and cycling distance to these may indicate compactness of a city.

A compact city is planned for inhabitants to have easy access to public services in the city (Lehmann 2016). Lehmann means that many researchers think that dense and compact cities are more sustainable. In a compact city walking and cycling is easier due to closer distances. Public transportation is also linked strategically to different zones in the city that will make it easy for people to use. The negative impact of the environment will also decrease in compact cities Lehmann (2016) means. Further he mentions that many experts today discuss that a compact city is a sustainable city and that there is more negative effect of the environment when the city expands and uses land outside.

A compact city can create more economic value to the city due to closer walking distance for people to everyday commodities (Lehmann 2016, Göteborgs Stad 2014). A more dense city decreases the space between services which can increase the consumption. More people have walking distance to everyday commodities in a compact city and less people are dependent on cars.

3.3 Planning strategies in Gothenburg

In Gothenburg the development of the city is based on a comprehensive plan and a development strategy (Göteborgs Stad 2020). These are used together to create a sustainable development for the city and provide information about areas which should be prioritized.

3.3.1 Comprehensive plan

The comprehensive plan of Gothenburg is a document that shows how the city wants to use the land to build and develop the city (Göteborgs Stad 2009). The plan is created as guidance to use as the city is growing. The population in Gothenburg is increasing and so is the traffic and other transportations. People are also traveling to a

higher extent and the comprehensive plan of Gothenburg focus on the development and how the city can stay sustainable both social, economic and environmental. In the comprehensive plan, 13 strategic questions are asked to be able to accomplish the goal of creating a sustainable city and they are listed below.

1. Göteborgs role in a growing region
2. **An attractive city environment**
3. A robust community
4. **More homes**
5. Growth and change in retailing
6. An expanding business sector
7. Scandinavia's logistics centre
8. Changing transport demands
9. Diversity, security and humanity
10. **Recreation and health for a better quality of life**
11. Natural and historic environments that attract
12. Access to the coast
13. Locating special sites

The development of the intermediate city is important to create a more compact and accessible city and to connect the outskirts with the core of the city (Göteborgs Stad 2009). The development in the intermediate city is important to create attractive business areas, to increase the number of work opportunities. The connection to the core is significant and the focus of the comprehensive plan is to develop areas around strategic nodes to make it easy for people to connect with other parts. The outer parts of the city will also be in focus and the strategy is to develop around already existing built up areas. The risk of leaving the development half done will decrease if expanding already built areas.

3.3.2 Development Strategy 2035

Göteborgs Stad has also created a development strategy until 2035 (Göteborg Stad 2014). This strategy is developed together with the comprehensive plan of Gothenburg and produced to be used as a guideline of planning as the city is growing. For Gothenburg to be an attractive city, four different strategy documents have been created, and the development strategy is one of them. The strategy aims to focus on areas in the intermediate city where an increase of quality is important to decrease segregation and to create an attractive environment to live in. The intermediate city has a well developed infrastructure system and potential to grow and become more dense. Östra Göteborg is a part of the intermediate city and one of the areas of prioritization.

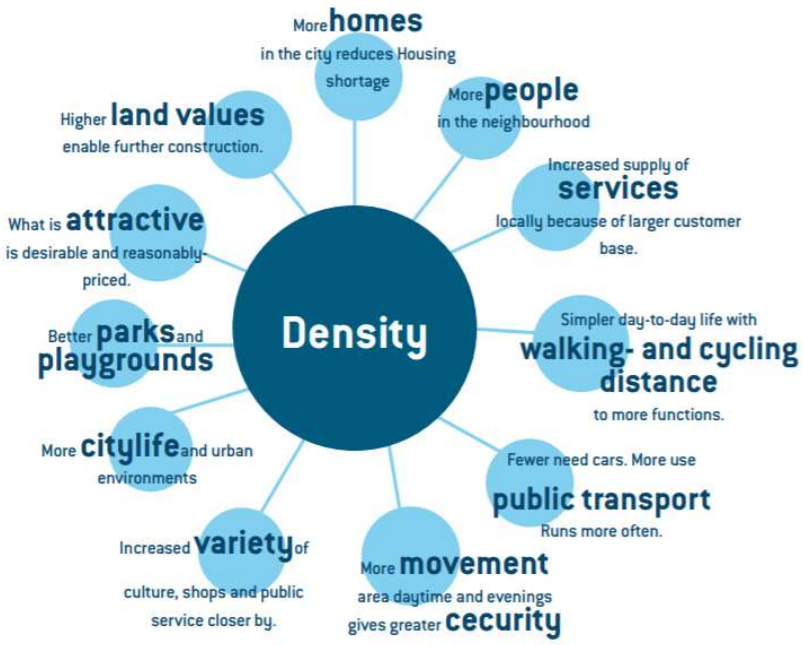

Figure 5. Connection between density and positive effects in the city (Taken from the Development strategy 2035 for Göteborgs Stad).

Densification in these areas can help with perceived quality for the people living there and the connections between density and positive effects can be seen in figure 5 above (Göteborgs Stad 2014). A more dense area creates more services, such as schools, and housing and makes it easier for people to move here. There is also a connection between population growth and increased number of work spaces. When densifying the city people have closer to work and public service and the need of transporting far away can be decreased. This will make the area more attractive for residents and create spaces where people can stay both day and night time. To have people staying here all times of the day is important to create a safe area. An increase of population makes it possible to increase the number of activities and increase the number of people involved in activities.

The intermediate cities are divided into different parts where the population in the centre of the city is higher than the population in the outskirts (Göteborgs Stad 2014). In the outer parts of the city, the distance for work is longer and the number of housing is less than in the core. An increase of housing is important in these parts to enable more work opportunities and closer distance for the inhabitants. The development strategy focuses on making everyday life easier for the people living in the intermediate city and a more dense city creates housing and job opportunities.

3.4 Planning process and regulations in Gothenburg

In this section, regulations and guidelines used in Gothenburg will be explained. Also, conservation programs and regulations regarding pre schools in Gothenburg will be covered.

3.4.1 Planning process

When a new building should be built, a planning process is needed to make the process correct according to laws and regulations (Göteborgs Stad 2020). There are many steps from early planning until construction and then managing of the building and the process can be seen in figure 6.

Figure 6. Planning process from early planning to managing building (Göteborgs Stad 2020).

Preparatory work: Identification of conditions to implement the plan and investigation of what can be used. Application of plan.
Planning process: Detailed development plan feasibility study. Starting meeting, referral and examination of the plan. Then proposal to BN.
Production: Detailed development plan legal force.
Managing: From project start until, managing of the building.

During the planning process an important part is the planning of detailed development plans. In section 3.4.1.1 detailed development is further described.

3.4.1.1 Detailed development plans

Detailed development plans are used to regulate land use and construction in different areas (Adolfson & Boberg 2014). The plans have different regulations based on what can be built. The detailed plans area divided into three different areas of use that are:

- Public space **(Allmän plats) -** Area used by the public for example streets and parks
- Building site **(Kvartersmark) -** Area of where private or public buildings can be constructed
- Water area **(Vattenområde) -** For example harbour

Every detailed plan must have regulations on the area of use (Adolfson & Boberg 2014). Further are the plans also divided into smaller areas with more precise regulations such as what can be built and to what extent. If all the regulations was

written out in the plans directly it would be too hard to read. The regulations are therefore shown with a symbol in the planning map and then explained on the side. There can be differences between old and new plans and the same symbols can have different meanings in different plans. It is therefore important to read every detailed plan carefully to see what applies in the current plan. Adolfson and Boberg (2014) explain that if an area has a certain restriction of what can be built, for example housing, there is not possible to build a school there. In the new plans created, the symbols have in general the same meaning. Some common symbols for detailed development plans and the meaning are:

A: General purpose - Services used for the general purpose for example schools can be built here. Used in old plans, is no longer used for creating new plans.
S: Schools and preschools can be built.
Nr: Schools and preschools in old city plans
B: Housing can be built.
Public space: Areas of park and public space. Here, nothing that does not apply for the public can be built and the parks can not be fenced.

Other restrictions in the detailed development plans are height limitations, angle of the roof, how much of the area can be built or number of floors. There can also be restrictions such as how the design of the building needs to be. Depending on design and restrictions the height of each floor can differ (Joklint, Öberg 2020).

3.4.2 Conservation programs

Conservation programs are developed to take care of the cultural heritage in cities (Göteborgs Stad 2020a). In Gothenburg, there are different conservation programs that can be valid in different areas (Göteborgs Stad 2020a). If a conservation program is valid in a certain area, there may be limitations on what can be built there. Some buildings must be preserved according to the conservation programs but some buildings can have restrictions on what can be built and what design is permitted. Different programs are created to preserve the cultural heritage and to promote the cultural identity.

The conservation programs can be valid in a certain area if antiques are found there (Göteborgs Stad 2020a). If there are old buildings with special architectural design common to a certain era, it may be valuable to preserve.

3.4.3 Regulations for preschools

The city of Gothenburg has regulations and guidelines to follow when building new preschools (Göteborgs Stad 2020c). The regulations covers playground area, noise and green space and is based on Boverkets recommendations (Boverket 2017). Providing less surface than needed can cause overcrowding and high wear of the

surface and decrease the quality of the environment. The balance between the amount of housing, public services, facilities and green space is significant when creating a high quality city (Arnberger 2012). Too much green space and long distances between public services and transportation may also create a lower quality due to longer distances and harder for people to connect with the core of the city (Boverket 2017). The minimum surface area for a playground is recommended to be 3000 m2. If the area is smaller it can be worn out and a sustainable playground can not be fulfilled. The regulations of noise and playground area can be seen in table 2 below.

Table 2. Regulations of surfaces for preschools

	Preschools (Göteborgs Stad)	**Preschools (Boverket)**
Playground surface [m2/child]	35	40
Minimum playground area [m2]	3000	3000
Maximum acoustic [dB]	55	55

The playground area is important when planning schools and preschools. In Gothenburg, it is more important than parking and the guidelines say that "if the space is not enough to fix both enough playground surface and parking, the prioritization should be the playground area" (Göteborgs stad parkering 2020).

Malmö Stad has created a document with guidelines for open space at preschools to create open spaces with high quality (Wallby 2011). The area counted as open space is described in figure 7.

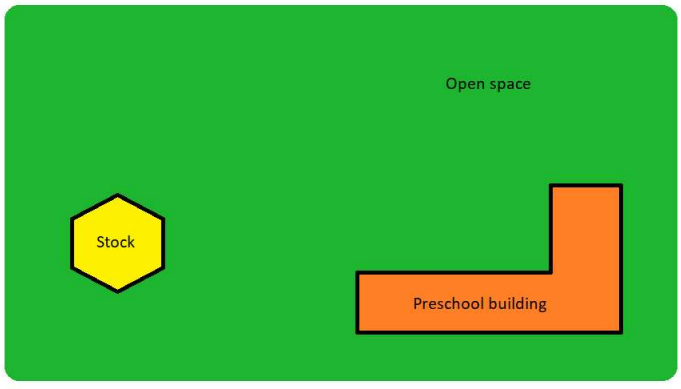

Figure 7. Illustrating open space. The open space is the space where the children can play. The preschool building and stocks are not considered in the open space. (Wallby, Malmö Stad)

4 Methodology

In this section, the methods used to collect information for the thesis is presented. The following methods were used to be able to answer the research questions and aim of the thesis. Literature study, analyzing of the objects and place visitation has been made.

4.1 Literature study

To collect information about different planning methods and theories important for the thesis, a literature study was made. A literature study is made to gain knowledge about the subject studied and also to be able to implement a valid and truthful study (Wallen 2011). Concepts of densification and different models for urban planning were investigated.

Books and articles were read to collect enough information and the literature study implemented in a wide range in the beginning and thereafter more narrow. This to get enough knowledge about the subject to be able to decide what could be important and not (Taylor 2013). When doing a literature study it is important to get a wide amount of information to create an unbiased report. Different sources need to be collected and compared. At least 2 different sources should be used for every statement to create a valid study and this has been implemented if possible.

4.2 Analyzing objects

An excel sheet template was created to be able to analyze the objects as similar as possible. The excel sheet can be found in Appendix 1. One excel sheet was filled in for every object. The questions in the excel sheet was created together with Jan Öberg och Mattias Joklint at Lokalförvaltningen and quantitative measures was used to avoid early interpretation when analyzing the objects (Wallen 2011).

To collect the information to fill in the excel sheets, a GIS program called GOkart was used. The program is the official webb map used in the city and contains different layers with information. In GOkart layers with detailed plans, information about real estates, conservation program, height curves, noise, rain, ongoing projects and other measurements can be found (GOkart 2020). The detailed development plans were analyzed based on limitations and the unused development rights. The height needed for each floor was determined to be 3,5m and this was used for all floors and all pre schools (Joklint, Öberg 2020. This simplification was used to make an easier calculation and to not consider half floors.

The property system used in Göteborgs Stad, Xpand, was also used to collect information (Xpand 2020). In Xpand information about objects, drawings, who is managing the building and if there are notes that should be considered regarding any objects.

Table 3. Based on Lokalprogram Förskola developed by Göteborgs Stad.

Sections	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Children	18	36	54	72	90	108	126	144
Building BTA [m2/child]	28	19	16	15	14	14	13	13
Building BTA [m2]	495	688	881	1074	1268	1461	1654	1847
Open space [m2/child]	35	35	35	35	35	35	35	35
Open space [m2]	630	1260	1890	2520	3150	3780	4410	5040
Total building + open space [m2]	**1125**	**1948**	**2771**	**3594**	**4418**	**5241**	**6064**	**6887**

The table 3 above is based on information from the “lokalprogram preschool” in Gothenburg. The open spaces stays the same even if the number of sections change. The building BTA will change depending on how many sections the preschool will contain. The information in the table was used when determine the potential of developing the preschools and to determine how many sections could be built.

4.2.1 Place visits

Visitation on site was also carried out on all the preschools investigated to fill in the blancs from the investigation above. All information can not be found in GOkart, Bygglovsarkivet, Xpand or FMaccess, so site visits were important to get all the information. When on site visitation, other inputs that could affect the possibilities could be obtained. Also discussions with the teachers on place were carried out to get inputs from them as well. Questions asked:

- Is the information obtained from programs correct? Compare drawings/reality.
- Is the activity correct according to plan?
- How much of the space is used? Playground, building, parking etc?
- What condition is the building in?
- Are there other aspects that need to be considered?
- Does the preschool teacher have any inputs?

The information gained from place visits was then added into the excel sheets and taken into consideration when deciding the potential of each object.

4.2.2 Compilation of objects

The collected information was compiled in an excel sheet, see Appendix 1. The objects were then assessed based on the information in the sheet and divided into 4 different groups depending on their potential.

1. High Potential

Objects with high potential are objects with unused development rights where it is possible to increase the number of places with 3 or more sections with place for 18 children each. It may have a big unused surface or it could be possible to build an extra floor. Objects with high potential has the possibility to increase

2. Medium Potential

If objects have unused surface but the playground area is not enough to use all of the potential. It could also be that there is unused surface and possibilities to increase the building, but the real estate is covered by conservation programs that needs to be considered and may affect the potential.

3. Low potential

Objects with low potential are used effectively and do not have any surface to increase the building on. It can also be that there is possible to build in one extra floor but the building is covered by conservation programs and cannot be changed or demolished.

4. Blanc

Some objects are ongoing and these objects have not been analyzed. It can be that a new school is planned and therefore not possible to analyze yet.

When the objects were analyzed and placed in a group based on their potential they were uploaded in a program called Xpand. In Xpand, employees at Lokalförvalningen can search for objects and see what potential they have.

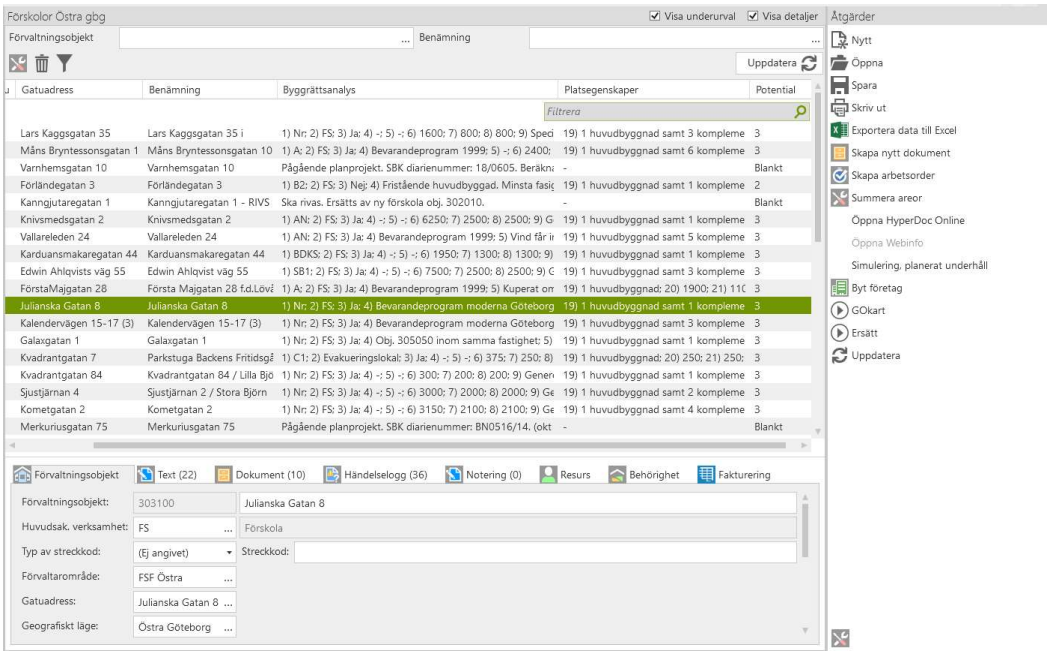

Figure 8. Results uploaded in Xpand. Every object has one row of information. (Xpand 2020)

In figure 8 above, the information from the excel sheet can be seen. The information was uploaded in the program Xpand and the information is presented as one row for each object. The information is presented this way since it then is possible to download the information in an excel sheet. When downloaded the information is possible to make searchable and filtered based on different properties.

5 Results and Discussion

In this section the results will be presented and discussed. The total potential to develop for all the objects will be presented. The results for each object will also be presented.

5.1 Potential in Östra Göteborg

There are in total 15% of the preschools within Östra Göteborg that have medium or high potential. This means it is possible to increase the number of preschool places within the current detailed development plan. Some of the objects have potential to increase their activity, but not as a preschool, according to the current plan. This is not considered as high or medium potential in this thesis since the focus is to develop the amount of preschool places. The potential of preschools can be seen in figure 9 below.

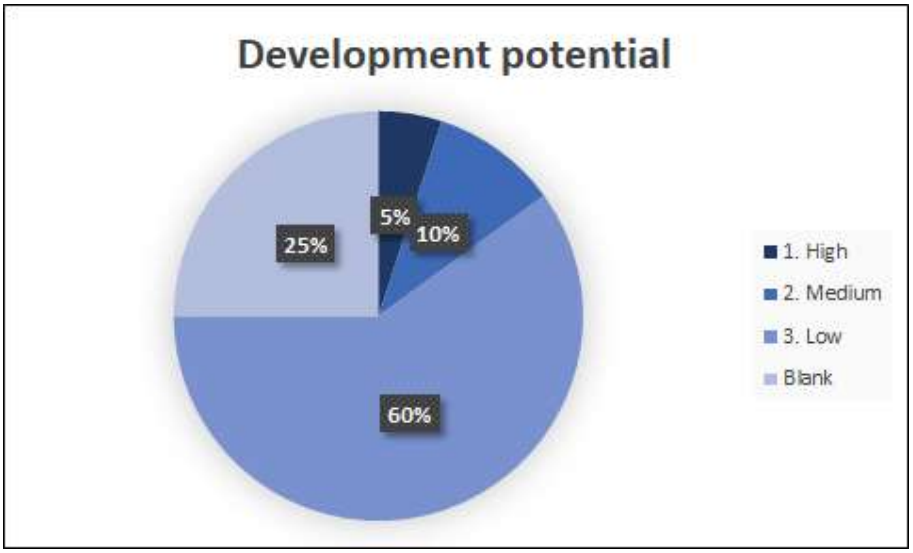

Figure 9. Percentage of preschools in Östra Göteborg with high or medium potential to develop within the current detailed plan.

In the following sections, more detailed information about the objects with high or medium potential will be presented. The potential number of new preschool places possible for these objects will be presented together with the motivation.

5.2 Objects with high potential

In this section, the objects with high potential will be presented and analysed. There are 2 objects with high potential within Östra Göteborg, and these are Meteorgatan 2 and Galaxgatan 5.

5.2.1 Meteorgatan 52

At Meteorgatan 52 there is a preschool and a housing facility in the same property. The building is in 1 floor and the current capacity is 3 sections with 18 children each. In figure 10, the site can be seen and the objects together with the development rights are marked. The figure shows that there is a big surface of unused development rights and this can be used to develop the preschool and increase the capacity.

Figure 10. Site of Meteorgatan 52. Red area: Unused development rights, Green area: current preschool, Blue area: Housing facility. Picture taken from GOkart 2020.

In table 4, information about current surfaces is presented together with information about the object and demand of increasing the preschool. In appendix 2, the excel sheet with all the information about the object can be seen.

Table 4. Surface measures and possible expansion at Meterorgatan 52.

	Current [m2]	**6 sections [m2]**	**Expansion [m2]**
BTA	750	1461	711
Open space	3200	3780	580
Limitations	Hilly area, Other objects within the property		

There are unused development rights of approximately 10200 m2 (BYA) and possibility to develop and expand the capacity. The area is hilly which can make it

hard to expand the ground surface (BYA). The plan approves building in 2 floors and it is possible to add 1 more floor. The hilly area is a limitation for building but this area is today used as open space. This area could also be expanded to increase the open space to have enough to increase the preschool capacity with 3 more sections.

It is possible to add 3 sections and thereby 54 preschool places.

5.2.2 Galaxgatan 5

At Galaxgatan 5 there is a preschool with 3 sections in 1 floor. Within the same property the school Gärdemosseskolan is also located. As seen in figure 11, there are a lot of unused development rights within the property.

Figure 11. Site at Galaxgatan 5. Red area: Unused development rights, Green area: Current preschool, Blue area: School. Picture taken from GOkart 2020.

The specific information about surfaces is presented in table 5 below. Specific information about the objects can be found in Appendix 3 where the filled in excel sheet can be seen.

Table 5. Surface measures and possible expansion at Galaxgatan 5.

	Current [m2]	**6 sections [m2]**	**Expansion [m2]**
BTA	800	1461	661
Open space	3100	3780	680
Limitations	Hilly area, Other objects within the property		

The unused development rights is approximately 15000 m2 (BYA). The development

rights in the detailed plan is big and the site can be used for any public purpose according to the plan. It is also possible to build in 2 floors. There is a school within the same property, but there is potential to develop and increase the capacity for the preschool if building in 2 floors.

Within the current detailed plan it is possible to increase the preschool with at least 3 departments and 54 places.

5.3 Objects with medium potential

In this section, the preschools with medium potential and the possible increase of places will be presented. In total there are 4 objects with medium potential.

5.3.1 Stjärnbildsgatan 3

At Stjärnbildsgatan 3, there is a preschool with 3 sections. The building is in 1 floor. In figure 12. the site can be seen. As seen in the figure, there are unused development rights within the property that could be used to increase the capacity of the preschool.

Figure 12. Site at Stjärnbildsgatan 3. Red area: Unused development right, Green area: Current preschool. Yellow: Property boundary. Picture taken from GOkart 2020.

In the table 6 below, the information about the surface is presented together with the needed expansion to increase the capacity. The filled in excel sheet is seen in Appendix 4.

Table 6. Surface measures and possible expansion at Stjärnbildsgatan 3.

	Current [m2]	5 sections [m2]	Expansion [m2]
BTA	775	1268	493
Open space	2600	3150	550
Limitations	Parking		

There are approximately 2000 m2 (BYA) unused development rights. Some of the area is currently used as parking space. Looking at recommendations in Gothenburg, the open space should be prioritized in front of parking. If the current parking place could be used as open space there would be enough space to increase the preschool with 2 more sections.

5.3.2 Hinderbanan 1

At Hinderbanan 1, there is a preschool in 1 floor built in 2010. The capacity of the preschool is 4 sections. In figure 13 the development rights and the total surface of the property is shown.

Figure 13. Site at Hinderbanan 1. Red area: Development rights, Yellow area: Property boundary. Picture taken from GOkart 2020.

In the table 7 below, the current surface information and needed expansion is presented.

Table 7. Surface measures and possible expansion at Hinderbanan 1.

	Current [m2]	6 sections [m2]	Expansion [m2]
BTA	850	1461	611
Open space	4300	3780	-
Limitations	Built 2010		

The current building is covering the development rights (BYA) but there is 850 m2 unused development rights when looking at BTA. It is possible to build in 2 floors and enough open space to add 2 more sections.

5.3.3 Aprilgatan 2A and 2B

Aprilgatan 2A and 2B are 2 different objects but located within the same property and will therefore be analysed together. At Aprilgatan 2A there is a preschool with 6 sections and built in 3 floors. At Aprilgatan 2B theres is a preschool with 6 sections and built in 2 floors. Together, the capacity of both 2A and 2B is 12 sections. The area is seen in figure 14.

Figure 14. Site at Aprilgatan 2A and 2B. Red area: Unused development rights. Green area: Current preschools. Blue area: Other objects. Yellow area: Property boundary. Picture taken from GOkart 2020.

Table 8. Surface measures and possible expansion at Aprilgatan 2A and B.

	Current [m2]	**14 section [m2]**	**Expansion [m2]**
BTA	1800	3308	1508
Open space	7244	8820	1576
Limitations	Other objects within the property. 2A is built 2018.		

There are approximately 8000 m2 unused development rights (BYA) and possibility to build in 3 floors. There are limitations such as other objects within the same property, but there is a big amount of unused development rights and possibility to increase the capacity of at least 2 more sections.

5.4 Total potential and discussion

In table 9 below the total increase of preschool places that could be possible is shown. The total number of preschool places if developing all the objects in Östra Götbeorg with high or medium potential will be 216 places.

Table 9. Shows the total potential increase of preschool places at objects with high or medium potential in Östra Göteborg.

Objects	**Increase of preschool places**
Meteorgatan 52	54
Galaxgatan 5	54
Stjärnbildsgatan 3	36
Hinderbanan 1	36
Aprilgatan 2A and 2B	36
Total	**216**

There will be an increased demand for preschool places in 2025 which is connected to the population increase in the area. Östra Göteborg that is a part of the strategic plan of Gothenburg will be developed. The demand needs to be fulfilled as Göteborgs Stad needs to provide the right amount of preschool places for the city. The demand will

increase every year and investigating the potential within current detailed plans can make it possible to keep up with the increasing demand. If the number of children in the area increases faster than the actual preschool places there will be a deficit of preschool places. The possibility of building without creating new plans will save time and also make it possible to fulfill the increasing demand. Looking at possibilities within current plans and not only creating new areas with new plans may be essential to fulfill the demand in the future. These potential preschool places will fill part of the demand of total pre school places needed in 2025. In figure 15, the demand that could be fulfilled is shown.

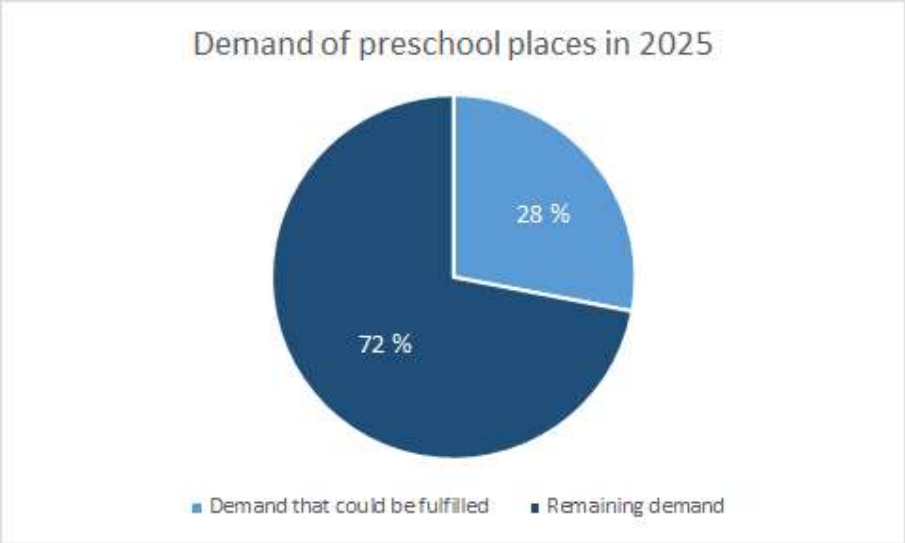

Figure 15. The figure shows the potential demand of preschool places in 2025 that could be fulfilled by developing current detailed development plans.

If developing the objects in Östra Göteborg, 28 % of the total demand in 2025 could be fulfilled without creating new detailed plans.

Using current sites to develop is an example of how dense cities could work. In this case, the possibilities that come with densifying inwards is good if they are used. There are places that can be used with regards to the regulations needed to consider. The lack of surface to exploit is a fact and as time goes it is all the more difficult to find places to develop. To fulfill the demand as cities become more dense, this method of looking at optimizing current detailed plans may be essential to continue with a sustainable city with the necessary facilities.

The demand of preschool places is connected to the population increase and the population density will affect the demand of preschool places. As Lehman (2016) and Berghauser et al., (2009) discuss the population density can be used to calculate the number of preschools needed. This is what Göteborgs Stad has been focusing on

when determining the upcoming demand. The land use intensity and open space ratio is also connected to the potential to develop. To follow the regulations in the city the open space regulations with 35 m2/ children needs to be fulfilled.

Looking at the comprehensive plan and development strategy of Gothenburg this method of using current detailed development plans can help with the goals. As seen in figure 5 in section 3.3.2 the purpose is to provide more homes, more people, increased number of services and also attractive areas with variety and high land values. Using current detailed development plans and considering the regulations and aspects of land use and open space can help with accomplishing this purpose.

In Östra Göteborg where the population is increasing and the comprehensive plan and development strategy aims to connect this part of the city with the inner core, current detailed plans could be a way of making this happen. Connecting Östra Göteborg with the city core provides a better quality for people living there and also making the area more attractive. When creating a more attractive area, more people could settle down. The demand of pre school places will need to keep up with that development not just to fulfil the demand, but also to keep a high quality densification. In the development strategy, Östra Göteborg is one of the areas of prioritizing to densify, and to use the land as effectively as possible is therefore vital. Using the current plans to densify is a way of creating this high quality city at the right time.

Also the planning process can be shortened when new plans do not have to be made and the purpose of creating high quality areas may be fulfilled faster. In the background section the description of the planning process and the time it takes to make new plans is described to be 2-4 years. If this time can be saved, it is possible to build faster and skip some steps of the planning process which also can decrease costs. The production cost also increases with time and using this method of using current detailed development plans can therefore decrease both time and cost compared to creating new plans.

This study has been completed as a rough inventory of the preschools in Östra Göteborgs. The results of the potential to be developed is based on surface and could be used as a base for further research. To be able to determine which of the objects can be possible to develop more aspects needs to be considered. This study is a step of the process of developing objects within current detailed plans and shows the potential possibilities to develop when looking at development rights and surface.

6 Conclusion and further research

To maintain sustainable cities with high qualities is an important challenge for cities. Densifying cities is a way of keeping up with the urban population growth and to continue to improve the systems and create sustainable solutions. The education system is a part of creating a sustainable city and the demand of preschool places is affected by the urban population increase. To keep up with the increasing demand of preschool places it could be possible to use current detailed development plans to densify Östra Göteborg and at the same time keep the quality and follow regulations.

There are possibilities to develop the amount of preschool places in Östra Göteborg within the current detailed plans. There are a lot of unused development rights but all of the surface may not be built upon due to limitations in the plan, regulations or other aggravating circumstances. In Östra Göteborg, 15 % of the preschools have potential to increase capacity. If these preschools are developed, it is possible to fulfill 28 % of the upcoming demand until 2025 without making new plans.

Since this thesis focuses on possibilities within the surface it could be interesting to use this as a base for further investigation. For further research it may be interesting to not only look at preschools but also other facilities in the city to see if they can be developed as well. It may also be interesting to consider operating cost and building year and take into account if it is possible to develop according to cost. Another aspect could be looking at the location of the preschools and investigating the impact of having close to home and if the location could affect the quality of densification and the attractiveness of the area.

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Appendix 1. Excel sheet template

Name | Property number / Object number | Address

INVESTIGATION OF EXPLOITATION POSSIBILITIES				
	Property	Content	Unit	Parameter Xpand
PLANNING REGULATIONS				
REGULATION OF USAGE				
1	Plan designation		text	Byggrättsanalys
2	Function		text	Byggrättsanalys
3	Function according to plan?		text	Byggrättsanalys
4	Limitation property		text	Byggrättsanalys
5	Other limitation		text	Byggrättsanalys
REGULATION OF PROPERTY				
6	Development rights. BTA theoretical		m^2 BTA	Byggrättsanalys
7	Development rights. BYA theoretical		m^2 BYA	Byggrättsanalys
8	Area where building can be placed.		m^2	Byggrättsanalys
9	Spread of area. Specific or general.		general /specific	Byggrättsanalys
10	Building height		m	Byggrättsanalys
11	Ridge height		m	Byggrättsanalys
12	Number of floors		number	Byggrättsanalys
13	Minimum angle of roof		degree	Byggrättsanalys
14	Maximum angle of roof		degree	Byggrättsanalys
15	Other information about configuration		text	Byggrättsanalys
ADMINISTRATIVE REGULATIONS				
16	Has the plan legal force		yes/no	Byggrättsanalys
17	Year of legal force		year	Byggrättsanalys
18	Year the plan will legal force		year	Byggrättsanalys
PLATSEGENSKAPER				
19	Description of building		text	Platsegenskaper
20	Exploitation. BTA		m^2 BTA	Platsegenskaper
21	Exploitation. BYA		m^2 BYA	Platsegenskaper
22	Exploitation. Number of floors.		antal	Platsegenskaper
23	Unused development rights.		BTA, BYA	Platsegenskaper
POTENTIAL				
24	Potential: 1=High, 2=Medel, 3=Low, Blanc=		1, 2, 3	Potential
25	Potential		text	Potential

Appendix 2. Excel sheet of Meteorgatan 52

Meteorgatan 52, preschool | Göteborg Bergsjön 10:6 306140 | Meteorgatan 52

INVESTIGATION OF EXPLOITATION POSSIBILITIES				
	Property	Content	Unit	Parameter Xpand
PLANNING REGULATIONS				
REGULATION OF USAGE				
1	Plan designation	A	text	Byggrättsanalys
2	Function	FS	text	Byggrättsanalys
3	Function according to plan?	Yes	text	Byggrättsanalys
4	Limitation property	Obj. 306720 within the same property.	text	Byggrättsanalys
5	Other limitation	-	text	Byggrättsanalys
REGULATION OF PROPERTY				
6	Development rights. BTA theoretical	28250 (tot. All property)	m^2 BTA	Byggrättsanalys
7	Development rights. BYA theoretical	11300 (tot. All property)	m^2 BYA	Byggrättsanalys
8	Area where building can be placed.	11300 (tot. All property)	m^2	Byggrättsanalys
9	Spread of area. Specific or general.	General	general /specific	Byggrättsanalys
10	Building height	8	m	Byggrättsanalys
11	Ridge height	-	m	Byggrättsanalys
12	Number of floors	2,5	number	Byggrättsanalys
13	Minimum angle of roof	-	degree	Byggrättsanalys
14	Maximum angle of roof	-	degree	Byggrättsanalys
15	Other information about configuration	-	text	Byggrättsanalys
ADMINISTRATIVE REGULATIONS				
16	Has the plan legal force	Ja	yes/no	Byggrättsanalys
17	Year of legal force	1964	year	Byggrättsanalys
18	Year the plan will legal force	-	year	Byggrättsanalys
PLATSEGENSKAPER				
19	Description of building	1 main building and 2 ancillary buildings	text	Platsegenskaper
20	Exploitation. BTA	1000	m^2 BTA	Platsegenskaper
21	Exploitation. BYA	1000	m^2 BYA	Platsegenskaper
22	Exploitation. Number of floors.	1	antal	Platsegenskaper
23	Unused development rights.	26700 BTA, 9750 BYA (tot. All property)	BTA, BYA	Platsegenskaper
POTENTIAL				
24	Potential: 1=High, 2=Medel, 3=Low, Blanc=	1	1, 2, 3	Potential
25	Potential	A-property, other activities are possible according to the plan. The area is hilly but it is possible to build in 2 floors. The hilly area could be used as open space and there is enough open space to increase the capacity of the preschool with 3 sections.	text	Potential

Appendix 3. Excel sheet of Galaxgatan 5

Galaxgatan 5, preschool | Göteborg Bergsjön 36:4 305050 | Galaxgatan 5

INVESTIGATION OF EXPLOITATION POSSIBILITIES				
	Property	Content	Unit	Parameter Xpand
PLANNING REGULATIONS				
REGULATION OF USAGE				
1	Plan designation	A	text	Byggrättsanalys
2	Function	FS	text	Byggrättsanalys
3	Function according to plan?	Yes	text	Byggrättsanalys
4	Limitation property	Obj. 305030 within the same property.	text	Byggrättsanalys
5	Other limitation	-	text	Byggrättsanalys
REGULATION OF PROPERTY				
6	Development rights. BTA theoretical	8750	m^2 BTA	Byggrättsanalys
7	Development rights. BYA theoretical	3500	m^2 BYA	Byggrättsanalys
8	Area where building can be placed.	3500	m^2	Byggrättsanalys
9	Spread of area. Specific or general.	General	general /specific	Byggrättsanalys
10	Building height	8	m	Byggrättsanalys
11	Ridge height	-	m	Byggrättsanalys
12	Number of floors	2,5	number	Byggrättsanalys
13	Minimum angle of roof	-	degree	Byggrättsanalys
14	Maximum angle of roof	-	degree	Byggrättsanalys
15	Other information about configuration	-	text	Byggrättsanalys
ADMINISTRATIVE REGULATIONS				
16	Has the plan legal force	Ja	yes/no	Byggrättsanalys
17	Year of legal force	1990	year	Byggrättsanalys
18	Year the plan will legal force	-	year	Byggrättsanalys
PLATSEGENSKAPER				
19	Description of building	1 main building and 2 ancillary buildings	text	Platsegenskaper
20	Exploitation. BTA	900	m^2 BTA	Platsegenskaper
21	Exploitation. BYA	900	m^2 BYA	Platsegenskaper
22	Exploitation. Number of floors.	1	antal	Platsegenskaper
23	Unused development rights.	7850 BTA, 2600 BYA	BTA, BYA	Platsegenskaper
POTENTIAL				
24	Potential: 1=High, 2=Medel, 3=Low, Blanc=	1	1, 2, 3	Potential
25	Potential	A-property, other activities are possible according to the plan. There is unused development rights and possibilities to build in 2 floors. There is enough open space to expand the current preschool. Nearby on property Bergsjön 36:5 is Gärdemosseskolan (obj. 305040) and it could be possible to expand these objects together.	text	Potential

Appendix 4. Excel sheet of Stjärnbildsgatan 3

Stjärnbildsgatan 3, preschool | Göteborg Bergsjön 50:1 306300 | Stjärnbildsgatan 3

INVESTIGATION OF EXPLOITATION POSSIBILITIES				
	Property	Content	Unit	Parameter Xpand
PLANNING REGULATIONS				
REGULATION OF USAGE				
1	Plan designation	Nr	text	Byggrättsanalys
2	Function	FS	text	Byggrättsanalys
3	Function according to plan?	Yes	text	Byggrättsanalys
4	Limitation property	-	text	Byggrättsanalys
5	Other limitation	-	text	Byggrättsanalys
REGULATION OF PROPERTY				
6	Development rights. BTA theoretical	3000	m^2 BTA	Byggrättsanalys
7	Development rights. BYA theoretical	2000	m^2 BYA	Byggrättsanalys
8	Area where building can be placed.	2000	m^2	Byggrättsanalys
9	Spread of area. Specific or general.	General	general /specific	Byggrättsanalys
10	Building height	4,5	m	Byggrättsanalys
11	Ridge height	-	m	Byggrättsanalys
12	Number of floors	1,5	number	Byggrättsanalys
13	Minimum angle of roof	-	degree	Byggrättsanalys
14	Maximum angle of roof	-	degree	Byggrättsanalys
15	Other information about configuration	-	text	Byggrättsanalys
ADMINISTRATIVE REGULATIONS				
16	Has the plan legal force	Ja	yes/no	Byggrättsanalys
17	Year of legal force	1973	year	Byggrättsanalys
18	Year the plan will legal force	-	year	Byggrättsanalys
PLATSEGENSKAPER				
19	Description of building	1 main building and 2 ancillary buildings	text	Platsegenskaper
20	Exploitation. BTA	800	m^2 BTA	Platsegenskaper
21	Exploitation. BYA	800	m^2 BYA	Platsegenskaper
22	Exploitation. Number of floors.	1	antal	Platsegenskaper
23	Unused development rights.	2200 BTA, 1200 BYA	BTA, BYA	Platsegenskaper
POTENTIAL				
24	Potential: 1=High, 2=Medel, 3=Low, Blanc=	2	1, 2, 3	Potential
25	Potential	There is unused development rights and enough open space to increase the capacity of the preschool with 2 sections. The preschool is built 1976.	text	Potential

Appendix 5. Excel sheet of Hinderbanan 1

Hinderbanan 1, preschool | Göteborg Kviberg 741:171 303140 | Hinderbanan 1

INVESTIGATION OF EXPLOITATION POSSIBILITIES				
	Property	Content	Unit	Parameter Xpand
PLANNING REGULATIONS				
REGULATION OF USAGE				
1	Plan designation	S	text	Byggrättsanalys
2	Function	FS	text	Byggrättsanalys
3	Function according to plan?	Yes	text	Byggrättsanalys
4	Limitation property	Valuable trees should be protected.	text	Byggrättsanalys
5	Other limitation	-	text	Byggrättsanalys
REGULATION OF PROPERTY				
6	Development rights. BTA theoretical	1600	m^2 BTA	Byggrättsanalys
7	Development rights. BYA theoretical	800	m^2 BYA	Byggrättsanalys
8	Area where building can be placed.	800	m^2	Byggrättsanalys
9	Spread of area. Specific or general.	Specifik	general /specific	Byggrättsanalys
10	Building height	-	m	Byggrättsanalys
11	Ridge height	-	m	Byggrättsanalys
12	Number of floors	2	number	Byggrättsanalys
13	Minimum angle of roof	-	degree	Byggrättsanalys
14	Maximum angle of roof	14	degree	Byggrättsanalys
15	Other information about configuration	-	text	Byggrättsanalys
ADMINISTRATIVE REGULATIONS				
16	Has the plan legal force	Ja	yes/no	Byggrättsanalys
17	Year of legal force	2008	year	Byggrättsanalys
18	Year the plan will legal force	-	year	Byggrättsanalys
PLATSEGENSKAPER				
19	Description of building	1 main building and 1 ancillary building	text	Platsegenskaper
20	Exploitation. BTA	800	m^2 BTA	Platsegenskaper
21	Exploitation. BYA	800	m^2 BYA	Platsegenskaper
22	Exploitation. Number of floors.	1	antal	Platsegenskaper
23	Unused development rights.	800 BTA, 0 BYA	BTA, BYA	Platsegenskaper
POTENTIAL				
24	Potential: 1=High, 2=Medel, 3=Low, Blanc=	2	1, 2, 3	Potential
25	Potential	It is possible to build in 2 floors and enough open space to build a preschool with 6 sections (expanison with 2 sections). The preschool is built in 2010.	text	Potential

Appendix 6. Excel sheet of Aprilgatan 2A

Aprilgatan 2A, preschool | Göteborg Kortedala 104:2 304120 | Aprilgatan 2A

INVESTIGATION OF EXPLOITATION POSSIBILITIES				
	Property	Content	Unit	Parameter Xpand
PLANNING REGULATIONS				
REGULATION OF USAGE				
1	Plan designation	A	text	Byggrättsanalys
2	Function	FS	text	Byggrättsanalys
3	Function according to plan?	Ja	text	Byggrättsanalys
4	Limitation property	Obj. 304060 and 304070 within the same property.	text	Byggrättsanalys
5	Other limitation		text	Byggrättsanalys
REGULATION OF PROPERTY				
6	Development rights. BTA theoretical	54600 (Tot. all property)	m^2 BTA	Byggrättsanalys
7	Development rights. BYA theoretical	15600 (Tot. all property)	m^2 BYA	Byggrättsanalys
8	Area where building can be placed.	15600 (Tot. all property)	m^2	Byggrättsanalys
9	Spread of area. Specific or general.	General	general /specific	Byggrättsanalys
10	Building height	12	m	Byggrättsanalys
11	Ridge height	-	m	Byggrättsanalys
12	Number of floors	3,5	number	Byggrättsanalys
13	Minimum angle of roof	-	degree	Byggrättsanalys
14	Maximum angle of roof	-	degree	Byggrättsanalys
15	Other information about configuration	-	text	Byggrättsanalys
ADMINISTRATIVE REGULATIONS				
16	Has the plan legal force	Ja	yes/no	Byggrättsanalys
17	Year of legal force	1952	year	Byggrättsanalys
18	Year the plan will legal force	-	year	Byggrättsanalys
PLATSEGENSKAPER				
19	Description of building	1 main building and 2 ancillary buildings	text	Platsegenskaper
20	Exploitation. BTA	1500	m^2 BTA	Platsegenskaper
21	Exploitation. BYA	550	m^2 BYA	Platsegenskaper
22	Exploitation. Number of floors.	3	antal	Platsegenskaper
23	Unused development rights.	See obj. 304060 fot totalt unused	BTA, BY	Platsegenskaper
POTENTIAL				
24	Potential: 1=High, 2=Medel, 3=Low,	2	1, 2, 3	Potential
25	Potential	A-property, other activities are possible according to the plan. There are unused development rights. Preschool is build in 2018. There are more objects within the same property.	text	Potential

Appendix 7. Excel sheet of Aprilgatan 2B

Aprilgatan 2B, preschool | Göteborg Kortedala 104:2 304070 | Aprilgatan 2B

INVESTIGATION OF EXPLOITATION POSSIBILITIES				
	Property	Content	Unit	Parameter Xpand
PLANNING REGULATIONS				
REGULATION OF USAGE				
1	Plan designation	A	text	Byggrättsanalys
2	Function	FS	text	Byggrättsanalys
3	Function according to plan?	Ja	text	Byggrättsanalys
4	Limitation property	Obj. 304060 and 304120 within the same property.	text	Byggrättsanalys
5	Other limitation		text	Byggrättsanalys
REGULATION OF PROPERTY				
6	Development rights. BTA theoretical	54600 (Tot. all property)	m^2 BTA	Byggrättsanalys
7	Development rights. BYA theoretical	15600 (Tot. all property)	m^2 BYA	Byggrättsanalys
8	Area where building can be placed.	15600 (Tot. all property)	m^2	Byggrättsanalys
9	Spread of area. Specific or general.	General	general /specific	Byggrättsanalys
10	Building height	12	m	Byggrättsanalys
11	Ridge height	-	m	Byggrättsanalys
12	Number of floors	3,5	number	Byggrättsanalys
13	Minimum angle of roof	-	degree	Byggrättsanalys
14	Maximum angle of roof	-	degree	Byggrättsanalys
15	Other information about configuration	-	text	Byggrättsanalys
ADMINISTRATIVE REGULATIONS				
16	Has the plan legal force	Ja	yes/no	Byggrättsanalys
17	Year of legal force	1952	year	Byggrättsanalys
18	Year the plan will legal force	-	year	Byggrättsanalys
PLATSEGENSKAPER				
19	Description of building	1 main building and 2 ancillary buildings	text	Platsegenskaper
20	Exploitation. BTA	1800	m^2 BTA	Platsegenskaper
21	Exploitation. BYA	900	m^2 BYA	Platsegenskaper
22	Exploitation. Number of floors.	2	antal	Platsegenskaper
23	Unused development rights.	See obj. 304060 fot totalt unused development rights within the property.	BTA, BY	Platsegenskaper
POTENTIAL				
24	Potential: 1=High, 2=Medel, 3=Low,	2	1, 2, 3	Potential
25	Potential	A-property, other activities are possible according to the plan. There are unused development rights. There are more objects within the same property.	text	Potential