Decision-making on high-rise residential buildings in Eindhoven

A case study on the decision-making process around the implementation of residential towers within a city centre

AUTHOR: CHIEM PIJNENBURG
MASTER THESIS FOR THE SPATIAL PLANNING PROGRAMME
SPECIALISATION: PLANNING LAND AND REAL-ESTATE DEVELOPMENT
NIJMEGEN SCHOOL OF MANAGEMENT
RADBOUD UNIVERSITY

July 2024, Nijmegen

COLOPHON

Radboud Universiteit

Title: Decision-making on High-rise residential buildings in Eindhoven

Subtitle: A case study on the decision-making process around the implementation of residential towers within a city centre

Author: Chiem Pijnenburg

1st supervisor: I. Barba Lata

Place: Nijmegen

Date of publication: 03-07-2024

Version number: 1

Key words: High-rise residential buildings/ densification/infill/ Decision-making/housing

Preface

This is my master's thesis ‘Decision-making on high-rise residential buildings in Eindhoven. It has been written as the final product to fulfill my graduation form my master’s degree in Spatial planning: land and real-estate management at the Radboud University Nijmegen. After completing my bachelor in Geography, spatial planning and environment at the Radboud university last year, i decided to to delve further into spatial planning. The past 6 months i have been working on this qualitative research on how decisions are made in the case of Eindhoven on the implementation of high-rise residential buildings within the city centre. This topic gained my interest because of the housing crisis in the Netherlands, and my search for possible solutions to this problem. I quickly wanted to focus on how densification in the form of high-rise buildings could contribute to a possible solution. I would like to thank my supervisor Iulian Barba Lata for all the help during the research process and all the feedback sessions that helped me a lot. Writing my master thesis has been an educational process in which i was able to apply the knowledge and skills that i gained during my studies. I would like to thank my friends, family and teachers for supporting me during the research process. I am also very gratefull to the respondents who took the time to do an interview with me. I hope you will enjoy reading my work.

Chiem Pijnenburg

23-6-2024

Summary

The pressure on the housing market in the Netherlands is growing. In het case of Eindhoven, the need for sufficient housing is a growing phenomenon. To tackle this problem, the municipality of Eindhoven has drawn up an ambitious policy in the field of housing construction, with the solution being densification in the city center through high-rise buildings. The basis for this policy is the policy document on the densification vision for the city center of Eindhoven. but how was this policy made? which general discourses have influenced this policy? which factors influenced the creation of this policy, and how was this ultimately translated into the policy?

The research question has been answered based on various theories, models and concepts based on scientific literature in combination with interviews. The literature covered a broader discussion on densification, infill and the use of high-rise within a city centre. The actors involved are identified as the municipality, housing associations, real-estate developers and interest groups. These actors formed the basis for conducting the data and are identified through this case study of the city centre of Eindhoven.

This research focuses on which factors influenced the decision-making process during policymaking regarding high-rise buildings in the city center of Eindhoven. In a qualitative study, data was collected through semi-structured interviews. the general discussion in science in the field of densification and high-rise buildings was examined and it was examined how this has translated into the Eindhoven case. After examining the discourses, the planning structure, the created and used tools of the municipality and the actual planning practices, it can be concluded that four themes have influenced the decision-making process surrounding high rise residential buildings in the city center of Eindhoven: political/governmental factors, environmental factors, market-oriented factors and societal factors. These four themes all have influenced the decision-making process surrounding the implementation of high-rise buildings in the city center of Eindhoven in various ways.

INHOUDSOPGAVE

1.INTRODUCTION

1.1 PROJECT FRAMEWORK

The Netherlands, a small country with a high density of residents. According to Population Pyramid (2023) the Netherlands has a population density of 424,13 p/KM2 in 2023 and with that number it is the 20th most densely populated country in the world. It's likely that this number will rise in the upcoming centuries, because the prognosis is that the population of the Netherlands will grow from 17.9 million in 2023 to somewhere between 18.9 and 22.3 million inhabitants in 2070 (CBS, 2024). These trends are already leading to a high demand in high-density housing in the Netherlands.

Another trend in the Netherlands that will make the demand on high-density housing grow even more is the degree of urbanisation in the Netherlands. The expectation for 2035 is that the biggest growth of population will be in municipality's with at least 100.000 inhabitants.

In a country which already has one of the highest densities of people in the world, also still has a growing population and urbanisation of big municipalities, a lot of new houses will be needed. Currently the Netherlands is already facing a housing deficit of approximately 800.000 housing units (EIB, 2016). This leads to a further worsening of the housing shortage, especially in some of the more urban areas, mainly because of the lack of space. The housing demand is far outpacing the supply.

But perhaps the biggest issue the Netherlands faces regarding to the housing crisis, is a lack of space as well as the functioning of the space we have. The Netherlands can't possibly build new homes without sacrificing an area of land with a certain function. When an impoverished industrial site is transformed into a residential area, it is not such an issue. However, there is so much scarcity of land in the Netherlands which makes it difficult to find suitable land to make way for transformations such as new housing developments. After all, to maintain a healthy environment, areas that lend themselves for farmland, recreation and nature should also be preserved and maintained (Boelhouwer & Hoekstra, 2009).

Because the land is scarce in the Netherlands, especially in big cities like Eindhoven, the price of land is currently very high. The price of building plots has risen in the Netherlands for the past decades and the expectation is that it will continue to rise (ABN Amro, 2023).

Figuur 2 Grondprijzen geëxplodeerd, vooral in meest stedelijke gebieden

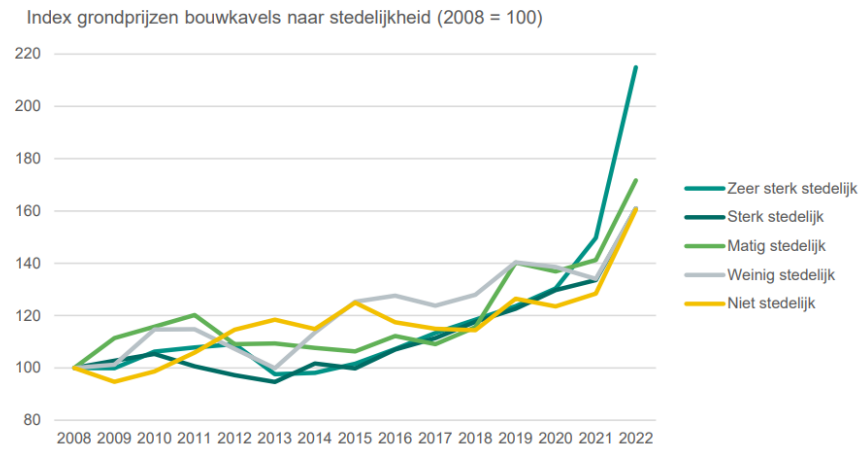


Figure 1 (ABN Amro, 2023)

1.2 RESEARCH PROBLEM

With these ongoing trends, Dutch cities will become more and more populated which will result in a growing demand on high-density in housing. A possible solution to a high demand of housing and scarcity of land could be the implementation of high-rise residential buildings. HRRB (high-rise residential buildings) could enable a maximum utilization of land. HRRB could house more people on a parcel of land compared to low-rise housing. This could result in a reduction of the housing shortage for the government. Other possible positive effects of HRRB are profits for project developers, more efficiency in the construction of cables, pipes and (rail)ways and the preservation of unaffected nature. The Dutch government wants to be frugal with the little parts of nature that the country still has, and therefore building up instead of building around the city's would have a positive effect on nature (Koelemaij, J., Wind, B., & van Weerdenburg, D, 2018).

In an article about implementing HRRB in Lagos, Nigeria, these positive effects of HRRB are also mentioned. In certain areas where the land is expensive, the reasonable solution would be to think vertical in order to optimize the land space. Using vertical construction architecture can change the future of urban environment in Lagos State, as in other cities. Vertical construction would lead to vertical cities which would help save energy, support the increasing population and help food production in terms of land preservation (Afolabi, A., Akinbo, F., & Akinola, 2019).

Another argument that is pro- HRRB is that the realisation of urban growth in combination with high density brings function mixing, encounter and the spread of knowledge. It brings up agglomeration benefits which contribute to the international competitive position of a city (Koelemaij, J., Wind, B., & van Weerdenburg, D, 2018).

However, HRRB also has its weaknesses. There is some kind of aversion against high-rise buildings in the Netherlands. This is firstly due to bad experiences with HRRB in the Netherlands. One particular example is the Bijlmer, a high-rise neighbourhood in Amsterdam. This neighbourhood faces many problems like accumulation of problem groups, social insecurity, drug abuse, and limited (financial) support for retail and other facilities. Secondly high-rise buildings also do not fit the Dutch tradition of city building. The city construction of for example Amsterdam and Haarlem distinguishes itselve positively from metropolises that emerged later. High-rise buildings can also cause horizon pollution.

High-rise could deprive people of the feeling of space and be perceived as ugly (Gadet, 2018). HRRB in Europe has a bad reputation due to lack of chances of the inhabitants. HRRB could also contribute to an unsafe feeling (Van Kempen, 1986).

A Dutch city where the implementation of HRRB is a major point of discussion is Eindhoven. The municipality has presented big plans in 2020 for the implementation of several HRRB in the city centre. The buildings in some of the specific areas chosen by the municipality are allowed to reach a maximum height of up to 160 meters (gemeente Eindhoven, 2020). According to the densification vision and the city marketing strategy of Eindhoven, HRRB are indispensable to address the growing housing shortage. With 70.000 new jobs in the upcoming years and plans for 21.000 new dwellings in the city, it seems inevitable that there will be implementation of new HRRB in Eindhoven (gemeente Eindhoven, 2020 ; EHV365,2021).

The EHVXL is an association for inhabitants of Eindhoven who are enthusiastic about urban developments in the Eindhoven metropolitan region. These inhabitants support the arguments for urban growth in the city centre. According to the EHVXL, densification leads to a compact city where a dense program provides a financial basis for high-quality public space and effective greenery. In addition, land in the countryside is saved (EHVXL, n.d.)

Despite the seeming necessity of HRRB in the city centre of Eindhoven, there are also many opposing views that induce discussion. In the city marketing document, the possible negative effects of HRRB on social cohesion and mental health are featured. In this document is stated that the municipality of Eindhoven should watch out for individualisation and negatively affect the dynamic of the city (EHV365, 2021). There are several groups of civilians that support this critique on the densification plans of the city centre. Arguments given against the implementation of HRRB are that the scale of this type of housing does not suit the cultural-historical city centre.The new developed housing would be too expensive for the ordinary men, a concrete city is unhealthy, too many residents would make the city centre inaccessible due to traffic congestion and there would be no demand for this type of housing in Eindhoven. According to the local councilllor the new plans do take into account the human dimension in the city centre, there is sufficient demand for this type of housing and living in one of the new residential towers will be possible and affordable for all levels of the population, and not just for expats (Theeuwen & Brabants dagblad, 2020).

In the case of Eindhoven there is a lot of discussion on how, why and where the implementation of HRRB in the city centre should take place. In this specific case, several decisions already have been made by the municipality. But how have these decisions been made, regarding the implementation of HRRB ? There are several factors that hypothetically have influenced this decision-making process. The research problem of this master thesis is to identify what these factors are and what the influence of these factors is on the decision-making process on the implementation of HRRB in Eindhoven.

The city centre of Eindhoven will be a good case because (A) the municipality has agreed to build a maximum of 21.000 housing units, within the city ring and(B) the municipality has a vision to grow and adapt the implementation of HRRB into the city centre (C) the municipality has made some changes in their policy/ made some concepts especially in recent years.

1.3 Research objective

The main goal of this research is to gain insight in decision-making processes on high-rise residential buildings in the Dutch City Eindhoven. The goal of this master thesis is to solve a knowledge problem. Through collecting insights of government employees and insights of project developers, the goal is to identify what the main bottlenecks are in decision making on HRRB in Eindhoven.

The pressure on the housing market in the Netherlands, especially in big municipalities like Eindhoven, is bigger than ever before. This has led to a broader discussion about densification methods for the city centre of Eindhoven. The municipality of Eindhoven has decided already that implementing HRRB will be the main densification method used in the centre of Eindhoven. Therefore, this research will focus on the implementation of HRRB.

By doing research on this topic, a conclusion will be formed on which factors have the most influence on the decision-making process. The information acquired through this analysis could be used to tackle certain bottlenecks in policy making on HRRB in Eindhoven, and possibly it could be generalised to similar Dutch municipalities. This research could contribute to certain societal benefits, like making living inside the city borders more accessible for all kinds of groups in society.

1.4 Research question and conceptual model

The following main and sub-questions emerged from the motivation, problem statement and research objective:

Which factors motivate the process of decision making on (not) implementing high-rise residential buildings in Eindhoven?

Sub questions:

1. How is the dominant discourse on HRRB in Eindhoven embedded in the structure of the planning system?
2. Which factors can be identified as influential factors on the decision-making process on HRRB in Eindhoven?
3. How are influencing factors assessed and incorporated into the vision document on HRRB?
4. How has the tool 'Densification vision Eindhoven' been used to turn plans into actual practices?

1.5 Scientific relevance

The factors that motivate the decision-making around high-rise buildings have been studied before. A study by Simons (2014) identified several factors that have had influence on high-rise development in Europe. In this thesis Simons (2014) concluded that a higher population has a positive effect on high-rise development in Europe and concluded that more restrictions by law has a negative impact on high-rise development in Europe. The thesis of Simons (2014) partly concluded that a lack of space leads to less high-rise development.

Needham (2006) stated the following*: scarce resources should be used efficiently. Nobody will deny the importance of this.* According to Needham (2006) there is one way of allocating scarce productive resources (in this case land) so that the production of goods and services is then the best possible. If

the production of goods and services is the best possible the market reaches a welfare optimum. The search for the welfare optimum has been very influential in public policy and land-use planning. It is however not possible to measure the amount of welfare in a society and therefore impossible to say whether the welfare optimum has been reached. A better approach would be to analyse an existing situation to examine the effects of a proposed policy change, and to attempt to decide whether the new situation would be, in total, better or worse than the original one (Needham, 2006). This master thesis will examine the effects of different factors (political, societal, economic and environmental) on policymaking on HRRB in Eindhoven, a city where recently a policy change has been made on HRRB in the city centre. Therefore, analysing this specific case could benefit the scientific debate on decision making on HRRB.

This thesis will continue to build on the conclusions of Simons (2014) but there is also critique. With a different approach in acquiring data (qualitative data through interviews) the goal of this research is to gain a different insight in the effects of factors on decision making on HRRB in Eindhoven. By talking to experts of HRRB development in Eindhoven this research will try to find a different perspective. By analysing the decision-making process this study will provide a clear overview of which actors and stakeholders are involved in Eindhoven and give an overview of how the factors that could influence the decision-making process are assessed. By analysing the policy evaluation and policy formulation process in Eindhoven on HRRB, this study will answer the question why certain factors have been included in the vision document on HRRB.

1.6 SOCIETAL RELEVANCE

As stated in paragraph 1.1 the Netherlands is facing a major housing deficit. Due to this housing deficit, it is hard for many households to find a house that suits their living standards and their financial situation. Especially the group households with low incomes have a hard time finding suitable housing (Jonker-Verkaart & Wassenberg, 2015; Schilder & Conijn, 2015; Vlak et al., 2017). This situation the Netherlands is currently facing is a situation where the housing stock doesn't match the financial situation of the Dutch population. This leads to possible loss of wealth and unwanted situations such as skewing of housing (CPB & PBL, 2016; Donders, van Dijk & Romijn, 2010).

The municipality of Eindhoven is also facing this issue and therefore looking for solutions. A possible solution the municipality of Eindhoven has mentioned in their vision document verdichtingsvisie binnenstad Eindhoven is a more efficient use of space and choosing infill in the city instead of building outside the city at expansion locations. Choosing for high building densities, with the implementation of HRRB could attract new residents, companies and employees and thus strengthen the urban economy and meet the housing demand (Nabielek, Boschman, Harbers, Piek & Vlonk, 2012). However, to much infill could cause negative effects. It can take up the open space needed to ensure the quality of life in the city (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016). HRRB could also deprive people of the feeling of space and be perceived as ugly (Gadet, 2018), HRRB in Europe has a bad reputation due to poverty of chances of the inhabitants (Van Kempen, 1986) and living in high-rise residential buildings would have negative psychological effects on people, for example fewer social contacts and social isolation. (Koelemaij, J., Wind, B., & van Weerdenburg, D, 2018).

Although there are many arguments against the implementation of HRRB in scientific literature, the municipality of Eindhoven still has made the decision to use HRRB as their main method for the densification of the city centre. Gaining understanding of the factors that motivate the decision-

making process on HRRB in Eindhoven could create knowledge that is necessary for solving a wicked problem like the housing crises in the Netherlands. The insights obtained through this research could contribute to a more efficient use of space inside the city centre of Eindhoven, and if possible be generalised to other cases in the Netherlands. These other cases are municipalities/city with a matching character. Especially for cities that are growing fast in population and have the character of a company town (just like Eindhoven) ,this research will be relevant.

1.7 Reading Guide

This thesis consist's of seven chapters. Chapter 1 contains the general introduction and is situated above. Chapter 2 is the theoretical framework, in which discussion's in the literature, the themes and the adapted theoretical framework are discussed. Chapter 3 presents the methodology of the research. Chapter 4 describes the case study area of the city centre of Eindhoven and the actors involved in this case study. In chapter 5 the results of the conducted interviews are presented. In chapter 6, after the analysis of the results the sub-questions are answered and recommendations are given for further research. Chapter 7 consists of the conclusion on the main question of this research, recommendations for practice and limitations of the research.

2. THEORETICAL FRAMEWORK

In this paragraph the theoretical framework of this research will be explained, alongside important definitions to understand the theoretical basis of this research.

2.1 DENSIFICATION

According to an article of Teller (2021) there are two approaches to the definition of densification. The first approach is related to densification as "an intention and denotes a resolve to increase urban density over time through different means in order to achieve predefined goal". Densification is this approach must be associated with other services, such as housing, transportation, and public space, to create a lively and well-structured living environment. The second approach on densification considers densification as a phenomenon of progressive increase of building/population density over time. Densification can be planned, it is always relative to a specific place or context, and may develop in very different urban configurations, both central and peripheral, with different speeds, driven by several factors and connected to a varied set of outcomes. Densification is not seen as a good or a bad phenomenon, but as a phenomenon that is different in every context and requires customization to ensure it runs smoothly (Teller, 2021).

To define density is a complex matter. Towers (n.d.) mentioned two ways to calculate the density of people living on one hectare. The first method is to simply calculate the number of dwellings per hectares. Early definitions of density used this calculation method. The problem with this method is that it can be misleading, due to the considerable variation in the sizes of dwellings. The second way of calculating density is persons per ha. To convert this into numbers you can calculate bedspaces per ha. Or habitable rooms per ha. Although bedspaces per ha. Would be the most precise way of calculating density, I prefer habitable rooms per ha. This is because of the fact that it's not possible to find out exactly how many beds there are in a hectare (Towers, n.d.).

How densified an area is can be judged differently by each individual. This is called perceived density. Density is not just how many people there are on one plot of land, but also how these people think about and experience the situation. The relation between an individual and the space around him can be very important. For example, if there are three people in a room they can be friends eating dinner together, or three strangers waiting in line for the checkout in a supermarket. In both cases the physical density is the same, but the perceived density will be different (*Designing High-Density cities*, z.d.).

Ebenezer Howard was a planner that came up with the idea of the garden city. It was an utopian vision on city planning, where all the good aspects of the city and the countryside could combine. This idea formed a response to the uncontrolled densification during the industrial revolution that created appalling living conditions in many cities. Only a few garden cities have truly been developed, but the concept was one of the first responses to densification and started a debate on the subject (Miller, 2002). Jane Jacobs believed that densification could provide a higher quality of life. She argued that densification can strengthen the quality of the living environment through sufficient support for easily accessible social, cultural and recreational urban facilities. Densification can also boost the urban economy by combining employment, good accessibility and high quality of the living environment Jacobs, 1961). When people criticize high-density areas, they often confuse it with overcrowding, but these are distinct concepts. High density refers to having more dwellings within a given land area,

whereas overcrowding means there are too many people living in a dwelling relative to the number of rooms the building consists of. Determining the right amount of densification is nuanced and cannot be answered definitively. It depends on how well the specific case performs. Densities become problematic when they hinder rather than enhance urban life. (Jacobs, 1961). Another benefit of densification is that it can prevent urban sprawl, making people less depending on their car. This has a positive effect on the quality of life and use of sustainable mobility. The challenge for planners is translating this densification into a sustainable future (Midu, 2014).

Densification has been a topic of interest in spatial planning studies mainly due to the growing urban population, and the associated housing shortage. In combination with a lack of space, which is often the case in big cities, a form of densification is needed as a solution to the housing shortage issue. To manage this challenge of densification, policies are being drawn up by the state and local authorities. Densification is more than just housing construction. A good functioning, and future-proof urban policy provides for sufficient number of workplaces in the region, recreation, accessibility, energy saving and generation, climate adaptation, nature and landscape.

2.2 Infill

The use of densification in city centre area's is linked to the urban compact city planning approach. A compact city is a city where the existing urban area is used as much as possible by building is high densities, mixing the use of functions and keeping new urbanization compact (Clerque & Hagendoorn, 1983) a compact city. building a compact city within an existing city requires infill. Benefits of infill are less social inequality, the city could be less depending on cars (Mouratidis, 2017), and it could increase social capital which is linked to experienced happiness of citizens (Sirowy, 2016).

However, there is also discussion in scientific literature about whether infill should be discussed in such a positive way. An example given in the literature is that a compact city does not fit the living standards citizens wanting to live in a greener environment. It could also lead to a decreasing quality of the living environment. This may arise because more people are living per m2, which can put more pressure on public space and facilities, and it could also increase the number of incidents on a local scale. (Nabielek, Boschman, Harbers, Piek, & Vlonk, 2012). In a case study on the Bijlmermeer project in the Netherlands, some factors in a compact city model are identified that could make living conditions worse. The first is proximity, which means that the deviant behaviour of one individual can disturb the lives of many, because people live so close to each other and share spaces like hallways and entrances. Congestion, overuse of resources could be another problem. Because of the habit of Surinamese people to take frequent showers and overcrowding, showering during rush hours was nearly impossible in Bijlmermeer. Anonymity and lack of social control, because of the design of high-rise buildings is a third factor mentioned in this case study (Van Kempen, 1986)

A possible economic effect of Infill could be the rise of housing prices, because the shortage of land could increase land prices, making developers pay more for their developments and the need to increase housing prices to make their business case feasible (Nabielek, Boschman, Harbers, Piek, & Vlonk, 2012).

The housing construction potential for infill (building on empty spaces inside city borders), transformation (changing the function of buildings to housing) and restructuring (renovating areas on a large scale for a residential or multifunctional function) is approximately ¾ of the housing stock

potential in the Netherlands. These are all types of developments that are (mostly) done within city borders. However, the potential of expansion (building outside the city on greenfield locations) is also at least ¼ of the housing stock potential (Rieuwerts, 2023). The arguments that strongly influence the discourse on infill or expansion are derived from research of Decision and Metafoor. According to this research, infill has a more positive effect on society than expansion. Where expansion is more expensive for the government, infill provides more employment opportunities, has a positive effect on the surrounding area and inhabitants of infill locations often have a more sustainable mobility behavior (Intres, 2023). Misunderstandings of developing inside the city limits are that a development would take longer than outside the city limits and that it would be too expensive. But according to research developments inside city limits have a greater social return than developments on exploitation locations (Rieuwerts, 2023). Infill development is also promoted by the European Commission through the no-net land take goal adopted in 2011 (EC, 2016). In practice, this means that all developments on previously undeveloped land should be balanced by restoring brownfield sites to their natural state by 2050. By this goal, land in Europe is now considered a non-renewable source. Land is seen as a scarce resource, and therefore it needs to be processed differently then we used to do (Preuß & Ferber, 2008).

Infill in a city centre can be executed in different ways. A city centre can consist of areas where new apartments can be built. It can also consist of buildings that can be transformed into dwellings, for example empty office buildings or industrial sites. Moreover, it is also possible that low density properties will be replaced by denser high-rise buildings. (Haaland & Konijnendijk van den Bosch, 2015).

2.3 High-rise buildings

A possible solution to densification problems is infill, and to optimize land use, high-rise residential buildings can be chosen as the dominant construction method. The concept of a more vertical living and working environment is namely often hailed as a solution to solve problems involving the growing cities and the continuing urbanization (Drew, Nova, & Fanning, 2014) (Zeiler, 2017).

High-rise buildings are only interesting when the price of land is high and the demand for land and living space is high (Gadet, 2018). The fact that HRRB are only interesting in these area's according to Gadet (2018) is because the building costs for HRRB are also high. Therefore, building in an area where there isn't a huge demand for living space, like the countryside, will not be feasible. Research has shown that locations with good accessibility are more attractive and have a higher market value than peripheral locations (Dieleman & Wegener, 2004).

A misunderstanding, however, is that with a HRRB the high costs for the land will always be returned. This is not the case in the Netherlands, because here municipalities work with residual ground value. This is a complex calculation method, where the value of the land is determined in consultation based on the building volume of a plot, the function and the value of the real estate to be developed. This means that the more you build, the more expensive the land will be. Dutch high-rise buildings are often made possible in combination with low-rise buildings. The profit made from the low-rise buildings can be used to finance the high-rise project (Zandbelt, 2011).

According to Simons (2014) an important factor for implementing HRRB is the availability of the right size building plots for high-rise development in a city centre. The development of HRRB can become

obstructed if there aren't suitable options to implement high-rise buildings. Especially in cities with a historical centre it can be hard to find suitable building plots. Other sources suggest that a lack of land could be driving factor for the implementation of HRRB:

"One of the reasons for adopting high-rise buildings could be solutions for density problems and lack of available land for development" (Ibrahim, 1998).

"There are many reasons to establish a high-rise building investment project…… for example the city of Rio de Janeiro & Hong Kong, they had other specific reasons such as terrain's conditions or the lack of land area like the United Arab Emirates and others" (Farouk, 2011).

The implementation of HRRB in cities started with the CIAM movement of famous architect Le Corbusier. This movement was popular during the period 1928-1959. This vision promoted HRRB as 'the living of the future' as they believed that this was the wish of the people and could create more equality (Wassenberg, 2006). In the Netherlands, this period can be defined as the old high-rise period. High-rise buildings were mainly social housing and were an effective response to the major housing shortage. The target group at the time was mainly lower-middle-class families. The high-rise wave started in the mid-1960s and stopped quite abruptly in the mid-1970s. The pursuit of a human scale and small scale became more popular among the population, as a result the massive construction of ground-level homes in suburbs and growth municipalities. This soon turned out to be much more attractive for families. High-rise buildings fell out of favour and were not built again until the end of the 20th century (Wassenberg & Bugera, 2024). These buildings have caused many failures and created an aversion against HRRB. Problems caused were isolated locations, social isolation and criminal behaviour. As a result of this negative image many western countries, including the Netherlands, HRRB was not used as an option in their urban planning. High-rise was only used for office locations and commercial uses (Midu, 2014).

The vision on HRRB nowadays seems to be changing. Around 2000, construction of high-rise buildings started again, firstly in Rotterdam. The 'new' high-rise buildings must be understood in the broader context of modern time: the de-industrialization of cities, increasing focus on the knowledge economy, smaller households, individualization, neoliberal policies, and the attractiveness of the now greatly improved inner cities for the (higher) middle class. These demographic, political, socio-economic, and cultural realities of cities underlie the creation and development of new high-rise buildings in the Netherlands (Wassenberg & Bugera, 2024).

Firstly, it is noticeable that the scale of high-rise buildings that has been used has changed. The shape is different: no long blocks but tall, narrow towers that mainly rise in attractive locations such as in the city centre, on the river, around public transport junctions or in business districts. It is used as a form of infill. Market parties play a considerably larger role in the process than in the 1960s and 1970s. At that time, housing associations, in combination with local authorities, took the lead in the production of homes, mainly in the social rental sector. Now, due to neoliberal policies, a shift has been made towards a more market-driven housing production. The new high-rise buildings are largely intended for buyers and private tenants and are being built by market parties All this has resulted in a focus on developing high-rise buildings in the private sector, both owner-occupied and rental properties, in attractive locations, in contrast to the social rental housing on the edges of cities in the 1960s and 1970s. The target group at the time was mainly families, while now it consists of small households, seniors ('empty nesters'), young professionals, all from the upper middle class. These people have

smaller households and are from a different socio-economic class that aspire to urban life and therefore choose centrally located areas in the city. Demographically speaking, this group is much larger than in the 1960s, when the group of home seekers mainly consisted of families. The cultural significance of high-rise buildings should not be underestimated. Many city councils encourage high-rise buildings in order to profile themselves compared to other cities. This new form of high-rise construction therefore often exhibits unique architectural features (Wassenberg & Bugera, 2024).

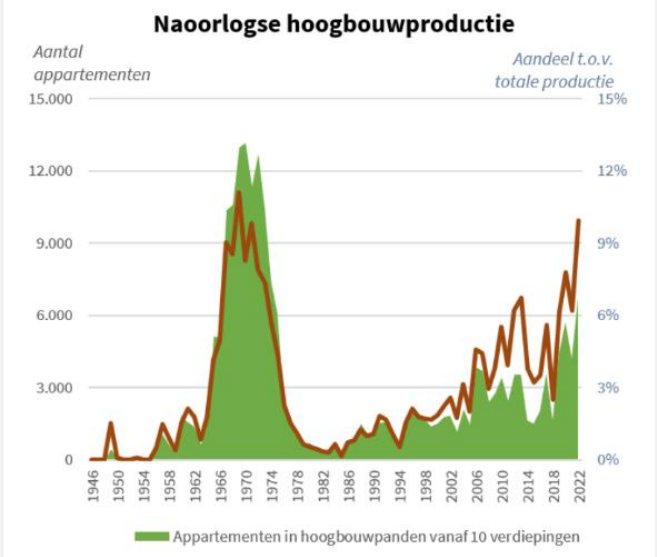


Figure 2, post war high-rise production in the Netherlands (Wassenberg & Bugera, 2024)

2.4 Decision-making

This study will analyse the decision-making process on HRRB to find out which factors motivate the process the most. To analyse this, we need an introduction in decision-making processes by municipalities.

2.4.1 Omgevingsplan

Per 1-1-2024 a number of changes has taken place for the Dutch legalisation of spatial planning. The new 'omgevingswet' has been implemented. Within the framework of the 'omgevingswet' all local policy frameworks for the physical living environment are enclosed in one document per municipality, the so called 'omgevingsplan' (zoning-plan). Rules can be laid down in the environmental plan for all aspects that influence the physical environment. These aspects are:

- **Buildings**
- Infrastructure
- Water
- Water systems
- Soil
- Air-quality
- Landscapes
- Nature

- Cultural heritage
- World heritage

The rules for buildings become legally binding in the zoning plan, so also the rules for HRRB. This are rules on for example the maximum height of buildings in an area, but it can also be rules on which type of housing (social rent, buy etc.) (Rijksoverheid, n.d.).

2.4.2 City council and college of B & W

The competent authority for the establishment of the 'omgevingsplan' is the city council. The city council is elected every four years in Dutch municipalities. The city council can delegate parts of the 'omgevingsplan' to the college of B & W (major and councillors). The major and councillors are also the competent authority to for issuing 'omgevingsvergunningen' (permits) and tests applications for initiatives and spatial developments against the omgevingsplan (Rijksoverheid, n.d.).

2.4.3 Procedure change in omgevingsplan

For every municipality there is one omgevingsplan. If you want to change something in the living environment, like for example implementing a high-rise residential building you firstly must look at the rules in the plan. If the plan allows it to build a HRRB and there is no demand for a building permit, u can start building immediately. This however will never be the case in practice. Building something that has a huge impact on the living environment like a HRRB will always be linked to a permit requirement. The procedure for obtaining a permit to change something in the omgevingsplan is as followed:

- Applicant submits permit application.
- The competent authority (college of B&W) has 8 weeks to take the permit into account
- The competent authority decides on the permit request.
- If the permit request is accepted, a publication of the request will follow in the newspaper of the municipality and on the website of the municipality.
- habitants of the municipality have 6 weeks to fine an objection.
- After these weeks the city council will take the objections into account and decide if they are valid or not and if the plan must change, be cancelled or can be accepted.
- After the plan is accepted, habitants have 6 weeks to fine an appeal against the permit by the 'Raad van state' (administrative judge).

2.4.4 High rise buildings policy

The case of this master thesis, the municipality of Eindhoven has a vision document where the policy on high rise residential buildings is discussed. Policy on HRRB is made in more municipalities in the Netherlands. A study of Elissen (2008) concluded that high-rise buildings policy is used to determine a general ambition for the city and the role of high-rise buildings in this. It is also used by municipalities to maintain control about what and where high-rise buildings may be constructed (Elissen, 2008). Although these documents are not legally binding, members of the city council and the college of B & W can use these documents to formulate a well thought out opinion.

Making policy on high-rise buildings can also have negative effects. In Tilburg the municipality presented a policy on high-rise with a map where high-rise buildings were wanted and were not. Project developers used this map to buy plots of land in the area's where high-rise buildings were wanted. These speculations caused a rise in land price. Another negative side-effect of the high-rise

buildings policy in Tilburg was oversupply. These negative side-effects in Tilburg have led to a new policy document in 2017. In that policy, the map image has been replaced by the obligation to an urban development analysis for every implementation of a high-rise initiative (Olthuis, 2018).

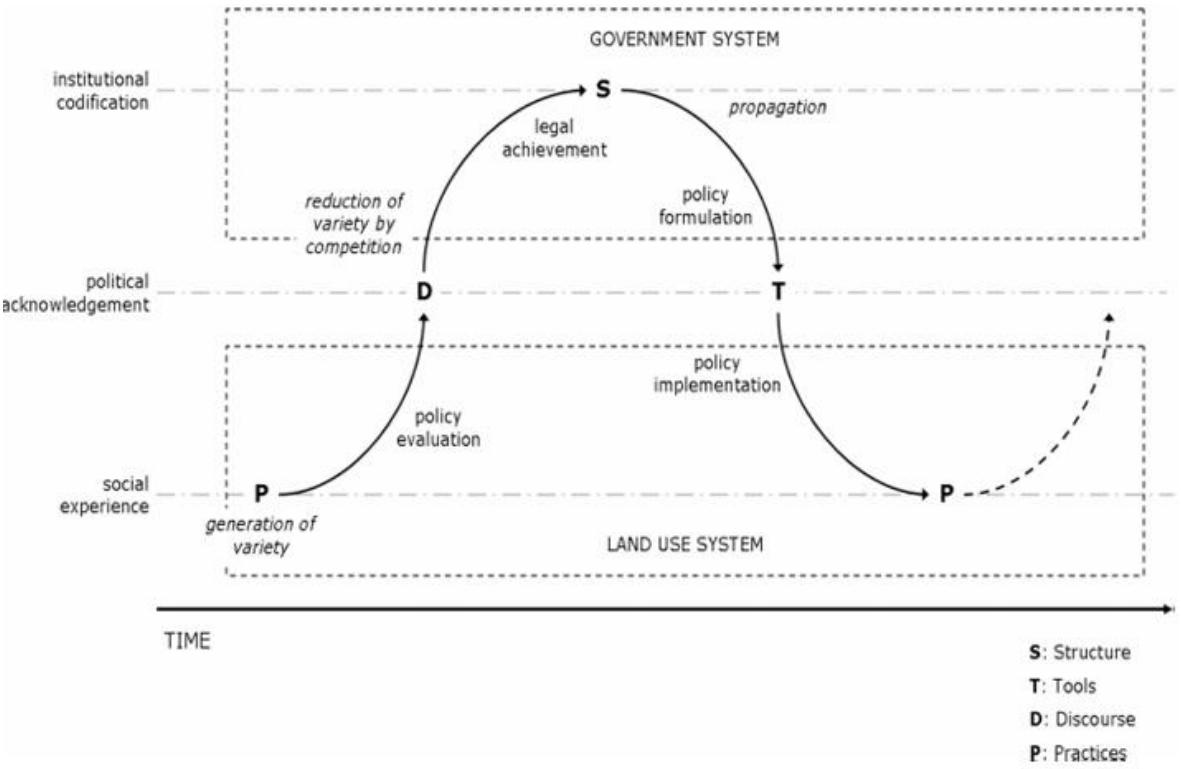
2.4.5 DECISION MAKING IN BIG PROJECTS

Projects for HRRB are often big projects with huge impact on the living environment. An article by Giezen et al. (2014) on decision making in mega-projects in the Netherlands stated that what seems to connect the different mega- projects (in this study infrastructure projects) is the desire to close the process as early as possible in order to create a sense of limited complexity and uncertainty. Although it is important to close the process from time to time to move forward, it is just as important to have an adaptive decision-making process. Strategic ambiguity and redundancy are crucial for this process.

To research decision making on high-rise buildings at the meso- and micro level, a theoretical model of Rivolin is adopted for this research. this is a model that describes a linear process from policy implementation to final development. This research chose this model because it gives structure to analysing a spatial planning model. With the use of this model, main dimensions and relationships describing the complex operation of a spatial planning system, such as the spatial planning system in Eindhoven can be highlighted. The framework by Rivolin is a framework that explains the evolution of a planning system. It takes complex processes into account like institutional processes, political conflict, economic dynamics and the social struggle of land use (Rivolin, 2012). The four components of this framework (discourse, structure, tools and practices) will be further highlighted in the next paragraph, in the context of the Dutch planning system and the local planning system in Eindhoven.

2.5 Theoretical framework by Rivolin (2012)

In this research the goal is to analyse the decision-making process on the implementation of HRRB in Eindhoven, which is a planning practice inside the planning system of Eindhoven. To understand the planning system as a specific social construct and to understand the shaping of the planning culture of Eindhoven, the planning evolution model (Figure 2) by Rivolin (2012) is adopted. This model will serve as a theoretical framework for the research design of this study.



Simplified pattern of planning system evolution. *Source*: Author's own.

Figure 3, (Rivolin, 2012)

This model provides a simplified pattern of the evolution of a planning system. The practices, structure, tools and discourse are the four main indicators for this model. The institution that decides on the implementation of HRRB is the municipality of Eindhoven. They manage the social construct by which communities of individuals organize, and through mechanisms of cooperate on matters like spatial planning (Rivolin, 2012). They are the main controller of the Dutch planning culture, which overlooks the interdependencies between social-economic and political values, norms, rules and law.

2.5.1 Discourse

When we talk about discourse, we talk about prevalent ideas, concepts and arguments in the frame of spatial planning in a particular context/area. As mentioned in the introduction of this paper there is a dominant discourse on the meso-level (national level) that the Netherlands is facing a housing crisis. To tackle this housing crisis the government came up with plans to build 900.000 new houses before 2030. Another dominant discourse on the meso-level in the Netherlands is the discourse on where we

should build. As discussed before, the dominant discourse on the meso-level is that the Netherlands needs more infill within cities to tackle the housing crisis. On the micro-level of Eindhoven, Infill is also the dominant discourse. This is because of the fact that the municipality of Eindhoven has an even bigger housing shortage than average in the Netherlands and the municipality of Eindhoven has hardly any construction locations available for expansions on the edge of the municipality.

Another discourse on the meso – level is the discourse on the implementation of HRRB. HRRB are seen as a solution to solve problems involving the growing cities and the continuing urbanization. However, in Dutch planning culture high-rise buildings have been abhorred for decades and were not seen as a solution to densification issues. Le Corbusier's gallery flats have caused aversion to high-rise buildings. Around the year 2000, high-rise buildings were first used on a large scale in Rotterdam, and since then the discourse surrounding high-rise buildings has been changing in the Netherlands. New high-rise buildings are narrow residential towers in locations where many people want to live, such as near train stations and in city centres.

2.5.2 STRUCTURE

This discourse on densification in the Netherlands has led to several changes in the planning structure (S). The structure of a planning system is a set of constitutional and legal provisions allowing and ruling the operation of planning system (Rivolin, 2012). In this structure the legitimate share of the government intervention on the land use system is regulated. It confers legitimacy to certain combinations of planning and control activities, attributed to the planning system in order to assign individual rights for land use.

On the meso-level the discourse on the need of infill has been adapted. Infill inside the city borders is needed but implementing HRRB is not the only possibility to densify an area. Why the decision has been made to implement so much HRRB instead of densifying the area in other ways is determined inside the government system due to reduction of variety by competition.

On the micro-level the municipality of Eindhoven has adapted the discourse on the need of infill and 'new high-rise. To come to actual practices, the municipality has adopted legal achievement in several legal documents (such as the omgevingsvisie and the densification vision) that set clear frameworks for the possible implementation of high-rise buildings in the municipality. The municipality has given a short explanation in the densification vision why they chose for the implementation of HRRB as a dominant practice:

By choosing in the centre for a high-urban living and working environment, we create a complementary housing supply at a regional level, that fits the image we want as a central city of the Brainport region. In addition, it is also necessary to continue building in all neighbourhoods (gemeente Eindhoven, 2020).

To turn discourse eventually into a new planning practice, there has to be some form of legal achievement within the planning structure to do so. Dutch municipalities have the legal achievement to determine where and in what form new development is allowed. All rules for new development that have spatial relevance (height, measurements, function, housing type etc.) are determined in the tool 'omgevingsplan'. The competent authority for the establishment of the 'omgevingsplan' is the city council. The omgevingsplan is a zoning plan for the entire territory of a municipality. The major and councillors are the competent authority for issuing 'omgevingsvergunningen' (permits) and tests applications for initiatives and spatial developments against the omgevingsplan (Rijksoverheid, n.d.).

The legal achievement of the discourse on HRRB happens inside the government system, but there is collaboration with other actors. For the vision document, there was consultation with project developers, citizens and interest groups. Although these actors have no decision-making rights, their opinions and arguments are reckoned with in the Dutch polder model when making a decision.

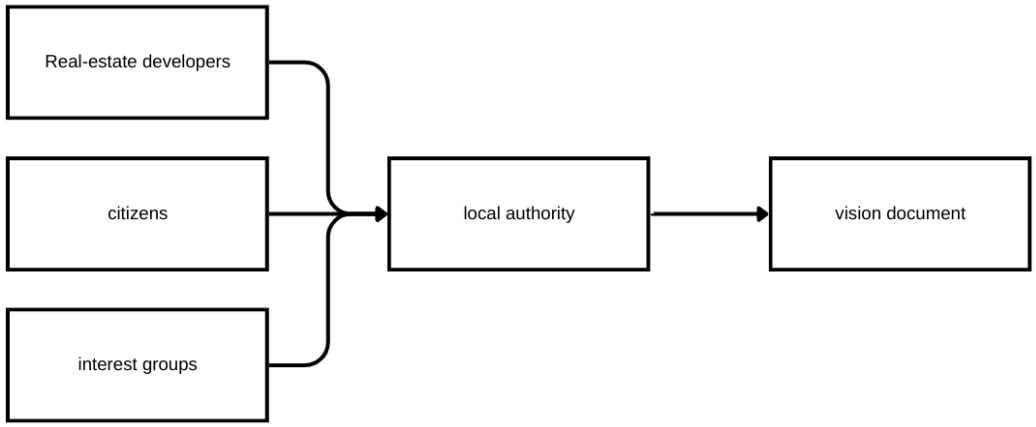


Figure 4, Outhor's own

2.5.3 Tools

Within the government system there is legal achievement to form a policy on a dominant discourse in spatial planning, which is in this case the implementation of HRRB in the city centre of Eindhoven to densify the area. To formulate this discourse into policy, tools are used. Tools are control devices, monitoring and evaluation procedures and various forms of economic incentive to turn a dominant discourse into a planning practice. Spatial planning tools are generally recognized as 'plans', although these may be of very different nature, ranging from regulative zoning maps to strategic programs, visions or guidelines (Rivolin, 2012).

On a meso-level there are two tools used to determine a policy on HRRB in the Netherlands. The first tool is the 'omgevingsplan' which is a legally binding tool where all rules for new development that have spatial relevance can be determined.

The second tool that a municipality in the Netherlands can use to implement a policy is a vision document. Vision documents are used to determine a general ambition for the city for a certain topic (for example a mobility vision, living vision, sustainability vision etc.) These visions are used by municipalities to maintain control on a certain subject. the visions can be used by both the municipality itself and by initiators as an assessment framework for new plans that relate to the subject of the vision. These vision documents are not legally binding, but members of the city council and the college of B & W can use these documents to formulate a considered opinion.

On the micro-level, the municipality of Eindhoven has formulated a 'densification vision' for the city centre of Eindhoven where the new densification plans for the city centre for the coming decade are highlighted and explained. This densification vision is part of a bigger structure of tools used by the municipality of Eindhoven for big spatial challenges inside the municipality borders. The Verdichtingsvisie binnenstad is together with the Ontwikkelingsvisie Fellenoord part of the

development perspective of the city centre. This development perspective of the city centre is a further elaboration of the omgevingsvisie (gemeente Eindhoven, 2020).

By using this tool, the dominant discourse has turned into a policy. This policy can be used to turn the plans to densify the areas into actual HRRB and giving the city of Eindhoven a 'brainport'-layer'.

2.5.4 Planning practices

Planning practices are the variety of practices generated from the social experience of planning control and activities. They are the manifestation of concrete forms of planning on local/regional level (Rivolin, 2012). In other words, these are the actual HRRB implemented in city centres. On the meso-level there has been an increase of HRRB development in the Netherlands.

However, the Netherlands remains a country with few high-rise buildings, which is also reflected in the figures. In total, there are more than 200,000 apartments located in high-rise buildings: defined as buildings with at least 10 floors. This amounts to 3 percent of the more than 8 million homes in the Netherlands and 7 percent of all apartments. However, only 38,800 apartments are currently at a height of 10 floors or more. 45 percent of these high-rise apartments can be found in the four largest cities in the Netherlands (G4), especially in Rotterdam and Amsterdam. the remaining 55% is distributed throughout the Netherlands. This spread is not limited to only the larger cities, but also in all other cities (Wassenberg & Bugera, 2024).

The idea behind implementing high-rise buildings has changed in recent decades. Where high-rise buildings were first used on the edges of the city in neighbourhoods with a clear structure and architecture, the new high-rise buildings are mainly built in places where many people want to live (close to stations, city centers). The buildings are more often mixed-function and have high-quality architecture (Wassenberg & Bugera, 2024).

On the micro-level in Eindhoven, it is possible to spot several HRRB in the city centre. However, most of the plans that were created as a result of the densification vision are still in preparation.

Hoogbouw*	Aantal appartementen in hoogbouwpanden	209.700	3%
	Aantal appartementen in oude hoogbouw	*105.300*	
	Aantal appartementen in nieuwe hoogbouw	*67.000*	
	Aantal appartementen uit overige bouwperiodes	*37.300*	
Laag- en middenbouw appartementen	Aantal appartementen in laag- en middenbouw	2.756.600	34%
	Aantal appartementen in panden < 10 verdiepingen		
Grondgebonden woningen	Aantal grondgebonden woningen	5.158.700	64%
	Aantal hoek-, tussen-, twee-onder-een-kap- en vrijstaande woningen, inclusief woningtype onbekend		
Totale woningvoorraad		**8.125.000**	**100%**

Figure 5, high-rise figures in the Netherlands (Wassenberg & Bugera, 2024).

2.6 IDENTIFIED THEMES

In the scientific discussion on the implementation of HRRB within city centers, four main themes are identified that play a role in decision-making. These themes are environmental factors, political/governmental factors, economic factors and social factors.

2.6.1 ENVIRONMENTAL FACTORS

Scientific literature shows that densification and high-rise buildings as a form of densification can have a positive effect on the environment.

Building high-rise in the right locations would lead to more sustainable energy consumption. Densification is also an important solution for the environment. We should not build the 900,000 homes that are needed in the Netherlands in the open areas between the cities, because then we would lose a lot of landscape quality. That is why densification in inner cities is a solution. (Koelemeij, Van Weerdenburg & De Olde, 2018).

Developing high-rise building will cost a lot of energy but in potential it could be more environmentally friendly than low-rise buildings, given the agglomeration benefits, less car use and reduction in travel time (Zeiler, 2017). according to Lotfabadi (2014), HRRB also have environmental advantages. The case study on the Tehran International Tower concluded that by implementing some simple sustainable principals and environmental factors such as vertical double-glazing windows for spreading out daylighting, shading devices, thermal insulation and proper orientation could lead to an reduce in energy consumption to approximately 30-35% in comparison with an ordinary building. Also due to living in high-density's, people need to use their car less and will make more use of bikes or walk because most public services will be closer (Ali & Al-Kodmany, 2012).

However, the construction of HRRB is very energy consuming. Production of materials and transportation costs a lot of energy. High-rise buildings can also cause shadow problems and temperature problems within the building which can cause a rise in energy consumption. according to Ali & Al-Kodmany (2012) high-rise buildings is do not automatically have a positive effect on the environment.

Another discourse on HRRB is how climate adaptative these buildings are or could be. The need to adapt buildings to a changing climate is a growing discourse in the field of spatial planning. Until the early 50's the development of Dutch city's was done on relatively high, dry places and more difficult places to build like swamps and stream valleys were avoided. But due to population growth there became a large demand for housing construction in huge area's regardless of the underlying landscape. This way of expanding is reaching its limits due to climate change. There is a high need of climate adaptative housing for the future (Timmermans et al, 2020).

A study of Hooff et al (2014) did research on the adaptive capacity to the climate of three types of housing (detached housing, terraced housing and apartments). This study concluded that there is a large difference between the number of overheating hours for the detached and terraced house on one hand, and the apartment on the other hand. The number of overheating hours and degree hours

for the apartment is significantly higher. The research also concluded that the application of less thermal mass in a building can be beneficial for the temperatures during night, but only when the heat inside the building can be released to the outside environment either through the building envelope, or by means of ventilation (Hoof et al, 2014).

2.6.2 POLITICAL/GOVERNMENTAL FACTORS

"a neutral, broad and creative view is needed in the police force field. Where politicians with conflicting ideals often clash, architects must be able to think about issues more broadly and in a more solution-oriented manner" (Koelemeij, Van Weerdenburg & De Olde, 2018).

this is a statement by the former government architect Floris Alkemade in an interview with agora magazine. It shows that the political force field often has conflicting opinions. Local authorities ultimately determine where to build or not. They therefore still have a decisive role in the decision-making process of all spatial developments. (Koelemeij, Van Weerdenburg & De Olde, 2018).

According to the literature, local authorities could have influence on decision-making on HRRB and actual practices through restrictions by law. A good example of the influence of local laws and restrictions on high-rise buildings is described in the book Form follows finance by Carrol Willis. In this book the cities New York and Chicago are compared on the influence of the local restrictions on the types of buildings. In New York there wasn't a restriction on the height of the building until 1916. In Chicago there became a restriction on height in 1893. This caused that buildings in Chicago have less height but their way to impress was due to mass. In New York a building gets status mainly due to height (Stichting Hoogbouw, n.d.).

In 1916 New York did get a zoning law which restricted 75% of the building plots with maximum building heights. Due to the zoning law bigger building plots became more attractive because these have a higher efficiency rate. In Chicago got a zoning law in 1923 which restricted buildings to not exceed 1/6 of the size of the main volume. Due to these different restrictions and zoning laws, Chicago and New York have a different skyline nowadays (Stichting Hoogbouw, n.d.).

Another point of interest for politicians is that high-rise buildings can be a status symbol for a city, especially the architecturally high-quality 'new high-rise buildings'. Politicians may find this interesting for city marketing purposes, for example, but also to put their own stamp on a city. Unique high-rise projects such as skyscrapers can give a city status and prestige. According (Mottaeva & Zheltenkov, 2018) the skyscraper is always a status construction, not only for the owner and the inhabitant, but also for all the district and the whole city, quite often thanks to the building, becoming the subject of tourism. *The status and prestige of such housing, interesting design and the view from the window, existence of characteristic infrastructure and subculture in a skyscraper are its qualities.*

HRRB and towers are the symbolisation of urbanity according to Zandvelt (2011). A tower looks good, gives a nice view, can hold an important employer into the city and can symbolise a new phase of urban development. These, more subjective factors should be the drivers for the implementation of HRRB according to Zandvelt (2014). A tower can be seen from long distance and gives a city status. The implementation of these buildings inside a city centre is an opportunity, not a must.

2.6.3 SOCIETAL FACTORS

The implementation of HRRB could have an impact on society, according to the literature. The psychological effects of living in high-rise buildings on the inhabitants is a factor that should be taken into account in the decision-making process. This is because high-rise living could cause multiple negative effects on residents.

High-rise living is less satisfactory than other forms of housing. In particular for parents of (small) children. Research also suggests that strain often results from high building or dwelling density, which can (but does not always) lead to crowding. A third problem that is caused by high-rise living is that children who live in high rises exhibit more behavioural problems than children who do not. There is more fear of crime, although this depends on the design of a building. The rates of helping others are also lower in high-rise buildings. The consequences of living in high-rise buildings are many. A few problems may be caused by the building form itself, but many are moderated by non-architectural factors. (Gifford, 2007).

High-rise buildings could also be a solution for societal problems, if implemented correctly. Loneliness is for example a growing problem in the Netherlands. The number of single households is growing, both for elderly and young people and this causes loneliness. These are matters that you must take very seriously, also when building homes. You can work on this by densifying and transforming existing residential areas. The knife cuts both ways, which means that if implemented properly, with for example communal spaces, high-rise buildings can contribute to combating loneliness (Nguyen et al, 2024).

That high-rise buildings have a great impact on both the physical and social living environment is also argued by Ali and Al-Kodmany (2012) argued that high-rise buildings could have a great impact on the social environment of a neighbourhood/city. According to them, there are various concerns that must be included when it comes to building high-rise. Residents of a city that already has a lot of high-rises (for example Rotterdam) will respond differently to a new residential tower than people in cities with few high-rise buildings (for example Eindhoven). The social circles that are created in low-rise neighbourhoods differ considerably from those in high-rise neighbourhoods. Residents of high-rise towers would also experience a more isolated feeling and would not feel really connected with nature anymore.

When implementing high-rise, it is important to consider different housing needs of different population groups. Therefore, it is important to offer many different types of housing in a densified area. think of differences in size, price range, rental or purchase, etc. very one-sided construction happens, for example, in China and India, which has a negative effect on neighbourhoods (Koelemeij, Van Weerdenburg & De Olde, 2018).

2.6.4 MARKET-ORIENTED FACTORS

The real-estate sector is influenced by market desires and other economic factors according to the literature. Dave (2010) states that the real-estate market wants to create places with high profitability. This is a driver for more concentrated operations and attracting investors. By densificating an area, the real-estate market wants to increase the value of an area (Aalbers, 2016). The first aspect that drives entrepreneurs to invest in real estate is capacity. According to Ter Weeme (2017) a shortage in space can lead to more urgency to invest in real estate. High-rise buildings have more capacity than low-rise

buildings. Therefore, implementing HRRB could be an aspect that drives more entrepreneurs to invest in projects.

The second driver for entrepreneurs to invest in real estate is the possibility to invest. If a municipality wants entrepreneurs to invest in HRRB projects the municipality needs to make it clear to possible investors that there is a possibility that a project will succeed (Ter Weeme, 2017).

High-rise buildings are often assiociated with high building costs, given the sophisticated foundations, technological facets, fire-resistant systems, etc. In addition, only 70% of the total surface area can be really used inside high-rise buildings (because of stairs, elevators etc.), while this is more than 80% for low-rise buildings. However, the land price may possibly rise due to the concentration of jobs and services (Ali & Al-Kodmany, 2012).

2.7 CONCEPTUAL MODEL

This research question and sub-question imply that there is a certain research gap. To visualize this research, gap a conceptual model has been made. The conceptual model also visualizes the relations between concepts that will be researched.

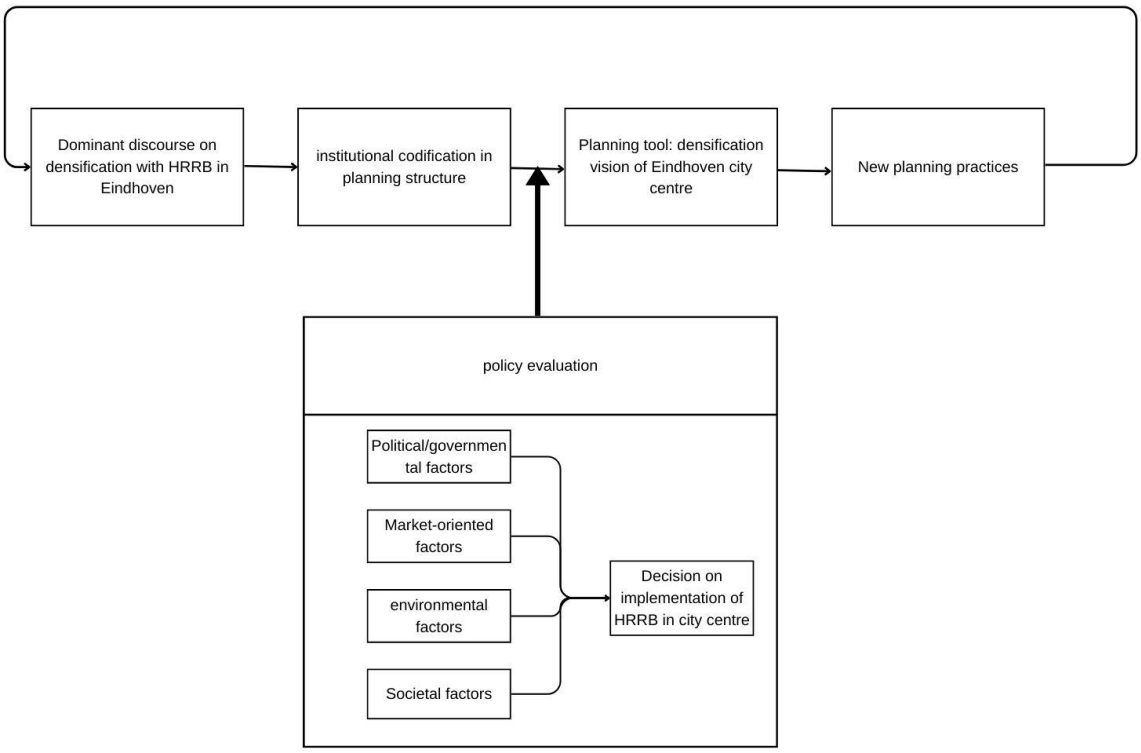


Figure 6, conceptual model, author's own

This model has adapted the path of the development of new planning practices by Rivolin (2012). A new dominant discourse in Eindhoven has led to an institutional codification in the planning culture. Inside the government system new policy formulation has taken place, which has led to a new planning tool (the densification vision of city centre Eindhoven) and will lead to new planning practices inside the city centre. Within this process the formulation of a new policy on HRRB in the city centre has taken place in Eindhoven. This specific part of the process is the part which will be examined

during this research. During the formulation of a new policy which has led to a new planning tool, several factors have hypothetically influenced the decisions made on the implementation of HRRB in the city centre of Eindhoven. The hypothesis of this research is that political, economic, societal and environmental factors have had influence on the policy formulation process.

3.METHODOLOGY

3.1 RESEARCH PHILOSOPHY

The philosophical approach that will be used in this research is the post-positivist approach. The post-positivist approach believes that reality is objective. However, it also believes human behaviour doesn't follow the laws of nature. Therefore, it distinguishes itself from positivism. When one does research with a post-positivist approach, one doesn't distinguish researchers and research topics as different elements. A researcher can have influence on the process. The goal in this research is to use probability to test the validity of accepted facts on individual cases. In this case study, the researcher will contain semi-structured interviews. Due to the semi-structured nature of the interviews, the researcher has influence on the research. the researcher determines the follow-up questions himself. therefore, this research is conducted with a post-positivist approach

3.2 RESEARCH STRATEGY

The research strategy contains a variety of steps. The first step is making a choice between breadth- and depth research. Breadth research is doing research with focus on creating an overview on the factors that could influence a dependent variable. Breadth research is less detailed than depth research, but by doing breadth research the generalisation of the results is possible. This is (often) not the case with depth research. Depth research is conducting extensive research into some aspects/factors (Verschuren & Doorewaard, 2007).

The second step is to determine whether the research will be done by qualitative or quantitative methods. Quantitative research is research focused on analysing numerical data. The results are shown with numbers and are often visualised in graphs and tables. Research strategies for quantitative data are the experiment, the survey and desk research Qualitative research are focussed on the way of thought behind an action. For example, the train of thought behind the decision making on HRRB in Eindhoven. The researcher wants to answer a 'Why' or 'How' question. Research strategies for qualitative research are desk research and a case study (Verschuren & Doorewaard, 2007).

This research will be qualitative research. The research strategy that will be used is a single case study based on thick description. The aim of thick description is to arrive a detailed understanding of the phenomenon that is studied. The information is analysed whilst being collected, and is gathered from different perspectives. The context and history will be considered as well. The vital instrument in this type of research is the reflexivity of the researcher, who is both a participant and an outsider, and who can therefore regard the information that is collected from several different perspectives. The research will be diagnosis based. This means that the researcher will try to establish what the problem is, and which factors and actors contribute to this problem in a positive or negative sense. The diagnosis helps to gain insight into possible keystones of a solution to the problem (Van Thiel, 2014).

The research method used to obtain qualitative data will be semi- structured interviews.

3.2.1 WHY QUALITATIVE RESEARCH?

According to Van Thiel (2014) adherents of qualitative research prefer to focus on describing and understanding reality in the context in which actors operate or in which certain phenomena occur. These aspects cannot be summarized in numbers. Therefore, there is need to obtain qualitative data such as texts and interviews. These forms of data provide better insight and do more justice to the complexity of reality. By doing qualitative research motivations, needs, perceptions and even emotions of actors can be identified which influence behaviour or ways of thinking.

The complex process of a decision-making process on HRRB in the case of Eindhoven is hard to put in numerical data. To research the factors that have influence on this process, a qualitative approach is needed to gain insight in the complexity of this process. This research will question why the municipality of Eindhoven has decided to take some factors into account when writing the verdichtingsvisie binnenstad Eindhoven and why some factors are not considered. How are these factors weighed/assessed?

Qualitative research is typically geared towards the exploration and description of the research subject, which means that it is predominantly inductive in nature. This does not mean to say, however, that qualitative data would be unsuitable as an input for deductive research (Van Thiel, 2014). This research will be partly deductive. Factors that could hypothetically influence the decision-making process are identified before the data obtaining phase has started. It is expected that these factors which are lighted out in the theoretical framework will be reflected in the data. This research is also partly inductive because it is possible that other factors that influence the decision-making process that are not identified yet will be mentioned during the data obtaining phase. If this is the case, these new factor(s) will be added when making the analysis of the obtained data.

There is some critique on qualitative research. Opponents of this form of doing research are stating that qualitative research is too subjective. The findings mainly consist of the own interpretations of a researcher, so these findings bound to just one person. Although this is a fair argument, there are certain measures that can be taken to ensure reliability and validity of the research. On measure is triangulation (mixing of methods). This will be done in this research and will be discussed afterwards. Other measures are noting the choices during the analysis in a log and having the coding scheme checked by other researchers (Van Thiel, 2014) Both of these measures will be taken during this research.

Another point of critique on qualitative research is that it would be virtually impossible to prove causality with qualitative research. Qualitative data will not give any indication of the (statistical) significance of results, which makes it more difficult to give a firm conclusion to a question. A theory that is developed for a particular case (situation, time and place) cannot be generalised to other cases.

Guidelines will also be taken into account for this qualitative research. Firstly, there will be a good selection of the case, the units of study (respondents) and data sources. The case selected is the city centre area of the municipality of Eindhoven. The selection of units of study is featured at the end of this paragraph. The data sources (existing literature & semi-structured interviews with experts) will also be featured . To analyse the data a computer program will be used, which will be ATLAS.TI. The choice for this programme will be featured in this paragraph. When the data will be analysed, I will not only look for confirmation of hypotheses or codes, but I will look critically at the data obtained and look for counter evidence. This will force me as a researcher to build a solid foundation for my theory.

In this research I will ask respondents for feedback, so that I can improve the way of interviewing during the process.

3.2.2 CASE STUDY

The case study, the research method that will be used for this thesis, is a research method that is used to gain an in-depth and integral image of one or some spatiotemporally bounded processes. The spatiotemporally process analysed in this research is the decision-making process on HRRB in the city centre of Eindhoven. One examines a small number of units of research during a case study and tries to gain more depth into the research. This depth is generated due to a labour-intensive form of data generation. In this study the qualitative data will be collected through conducting interviews. The respondents will be selected selectively and strategically. This will be done because the number of respondents is small. If the respondents would be selected random it would have huge consequences for the external validity of the research (Verschuren & Doorewaard, 2007).

A case study can make up a good integral picture which is a benefit for research with a goal of changing an existing situation. A case study is also more flexible and needs less prestructuring than other research methods. A third benefit of the case study is that the researcher often has a less distant role. Due to this less distant role of the researcher the results become more recognizable than with for example a survey. A disadvantage of a case study is that the external validity is much lower if compared to a survey. A case study has a low number of respondents, where a survey has a high number of respondents (Verschuren & Doorewaard, 2007).

There are multiple variants on a case study. The variant used in this research is the single case study. This means there is one single case selected, and the research question will be explored to the bottom for this specific case. This case study will take a holistic approach, which means that a large body of qualitative data will be gathered on everything to do with the case. The research methods used to obtain the data is conducting interviews with experts. (Van Thiel, 2014)

3.2.3 METHODS INTERVIEWS

To gain new qualitative data to analyse, semi-structured interviews will be conducted with several experts. How much experts will be interviewed will not be determined in advance. The data collection will have a thick description approach: this means that the data collected will be analysed during the data collection process and will be used in further data collection. So, for example data obtained during the first interview could lead to new questions for the second interview. By using the thick description approach during the interviews, the researcher has the possibility to regard the information that is collected from several different perspectives. An expectation is that 10 interviews with experts will take place during the data collection. The interviews will be taken on certain intervals during the research period (Van Thiel, 2014).

The interviews will be conducted in semi-structured form. A set of questions will be prepared to ask the respondent. These questions are partly based on the operationalisation of the variables derived from the theoretical framework as the research will be partly deductive, and some questions will be formulated to reflect the research problem. This gives the questions also an inductive approach. Based on the respondent's answers, follow-up/in-depth questions can be asked by the researcher that will be devised on the spot. The interview questions will be understandable, not too long and not ambiguous. Asking suggestive questions or giving my own opinion will be avoided. During the

interviews I will try to avoid difficult words and ask respondents to illustrate their answers with concrete examples (Van Thiel, 2014).

When conducting interviews, the most important measurement instrument is the interviewer (often the researcher self). It is important that the interviewer has sufficient knowledge about the topic, good interview skills and social skills (Van Thiel, 2014).

According to Bryman (2008), it is important that the interviewer does not deviate too much from the topic during the interview. In addition, it is important that no leading questions are asked during the interview. To prevent this, open questions were asked during the interviews and giving a choice was avoided as much as possible (Bryman, 2012).

3.2.4 SELECTION RESPONDENTS

The selection of respondents will be done selectively and strategically. The goal is to select a certain type of respondent as much as possible, which is the elite interview. These are people with prestige in the organization which I will research, the municipality of Eindhoven. If I want to analyse the decision-making process, I need to interview the people responsible for the decision making on HRRB in Eindhoven. Because the elite are often busy and unwilling or unable to make time, it will be necessary to add interviews with a different type of respondent. These types of respondents will be informants**.** Informants are respondent as who are familiar with the research situation without being involved in it (any longer). Think of former employees of an organization. Often informants can provide the researcher with knowledge that current insiders would be less inclined to share (sensitive information). Another type of respondent that will be considered for interviewing is the independent expert. These are respondents that do not form part of the research situation but are knowledgeable about it all the same, because, for example, they do research on the subject themselves (Van Thiel, 2014).

An overview of the respondents interviewed for this study is shown in figure 7 below:

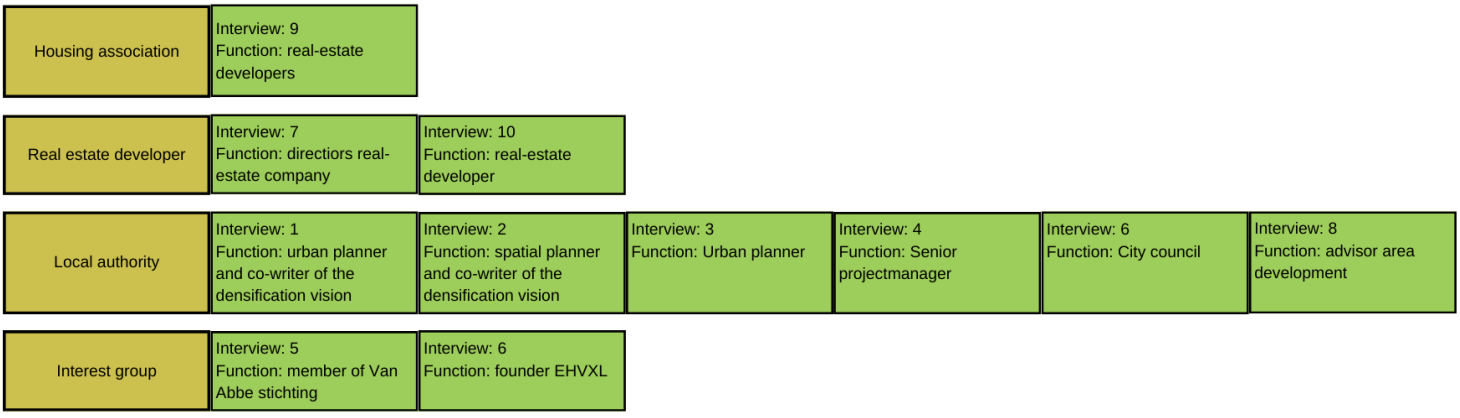


Figure 7, Author's own

The more structured an interview is, the more validity and reliability research has. The validity and reliability of a study also benefits from a large research population, consisting of people from various backgrounds and social positions. Such design would ensure more representativeness and contribute to triangulation. Conducting interviews is time consuming and labour intensive, and therefore there is no time to interview a large population. To boost the reliability and validity of this research, the

respondent selected will just be one type of respondent, but several types such as the elite, the informant and the expert. This gives a more diverse research population (Van Thiel, 2014).

3.3 Reliability

The reliability of a research is maintained by exempting the research for errors as much as possible. To prevent random errors when conducting the interviews, a standard questionnaire will be prepared for each type of respondent. This questionnaire will be the base for every semi-structured interview. To increase the reliability of the research, the setting and surroundings of the conducted interviews will be as equal as possible (Verschuren & Doorewaard, 2007).

The repeatability of a single case study where data is conducted through semi-structured interviews is unfortunately les guaranteed. This is because open questions will be asked during the interviews. Open questions lead to a lot of room for interpretation. In addition, the interviews will be semi-structured, which means that as a researcher I will ask spontaneous questions to the respondents. Determining why and when to ask an unstructured question will differ for each researcher (Verschuren & Doorewaard, 2007).

The repeatability of the single case study on decision making on HRRB in Eindhoven could also be less guaranteed. This is because policies can change over time and are heavily influenced by politics. Every four years a new city council is chosen in the Netherlands, which could implement other policies.

3.4 Validity

Validity is the degree in which results are valid and comply with reality. The validity of this research will be tested by looking critically at the four types of validity: content validity, construct validity, internal validity and external validity.

Content validity is the degree in which aspects of the concept that you want to measure are fully measured by the research instrument that is used. When studying a complicated process like decision making on the implementation of HRRB it is almost impossible to measure all aspects that could influence the decision-making process. Aspects like political incentives of policy makers might not be mentioned during interviews. The aim of this research is to find out which factors influence the decision-making process. Therefore, the expectation is that the content validity will be high but could have been higher (Verschuren & Doorewaard, 2007).

Concept-validity is the degree in which the research instrument used measures the concept that you want to measure. The interviews will probably also measure other concepts that the decision-making process. This is because open questions will be asked. These questions will be interpreted differently by different respondents, which could lead to different type of answers (Verschuren & Doorewaard, 2007).

Internal validity is the extent to which you can state with certainty that an established cause-and-effect relationship cannot be explained by other factors. Due to the wealth of the information collected due to qualitative data research, the internal validity of a case study is high (Van Thiel, 2014). The internal validity of this study will be high because a lot of factors will be considered. The goal is to measure what needs to be measured, which is the influence of … on the decision-making process on HRRB in Eindhoven. Conclusions will be drawn based on the answers from interviews in combination with the literature review (Verschuren & Doorewaard, 2007).

The external validity of this research, the extent to which you can generalize the results of this research to a larger population, is low. When executing a case study, it is difficult, if not impossible to generalize findings to other situations, either because the case is unique or because results only apply to the context that has been examined. The external validity for case study's, including this single- case study, is limited (Van Thiel, 2014).

4. CASE DESCRIPTION

Eindhoven is a major municipality in the province of Noord-Brabant, in the south of the Netherlands. The municipality had 246.517 inhabitants in November 2023 according to CBS (2024). The density of people (2769 per square kilometer) is high and the expectation is that there will be a population growth of 19,26% in 2035 (CBS, 2022). Therefore, the demand for a high-density housing is and will be bigger in Eindhoven than in most municipalities in the Netherlands.

What makes Eindhoven an interesting case is the approach of the city on implementing HRRB in the past few years. In 2008 the municipality of Eindhoven published a policy document on high-rise buildings. On 15-12-2020 the city council of Eindhoven has published a further supplemented and updated document, the Verdichtingsvisie Binnenstad Eindhoven (Densification Vision for the city centre of Eindhoven). In this document the municipality of Eindhoven stated that there is currently relatively little housing in the city centre. New residents could provide more liveliness and social safety to the city centre, as well employment and support for facilities. Therefore, the municipality wants to take a leap of scale in the city centre. To do so new HRRB wil be required (Gemeente Eindhoven, 2020).

"Following the tactical study Development Perspective Centre, we know that there is room for this maximum 21,000 within the Ring. Provided all preconditional measures in the area are met of mobility, greenery and water are met. By opting for a highly urban living and working environment in the centre, we create a supplementary housing supply at a regional level, which fits the image we want as a central city of the Brainport region" (Gemeente Eindhoven, 2020).

4.1 POLICY CHANGES 2008-2020

The original policy on high-rise buildings is anchored in De derde dimensie van een laagbouwstad , Hoogbouwbeleid gemeente Eindhoven (The third dimension of a low-rise city, municipality of Eindhoven). This policy document ,that was adopted in 2008, has been reformed and adapted in 2020 with new policy for the city centre.

In the policy document of 2008 four types of HRRB are identified: S-category (up to 15 meters), M-Category (up to 45 meters) L-category (up to 75 meters) and XL-category (up to 105 meters). The exact location of each category had not yet been determined in this document. This document looked at a broader focus area, the whole city of Eindhoven. To obtain location level approval for high-rise development, a HER (High-Rise impact report) was requested from the market parties. In a HER, it is required that developers demonstrate that the project meets a variety of criteria. These are (now outdated) nota from the municipality of Eindhoven, and spatial, technical and social criteria (gemeente Eindhoven, 2008).

In the new policy, Verdichtingsvisie Binnenstad Eindhoven VBE, the municipality introduces a new maximum height of 160 meters for HRRB in the city center. These buildings will belong to a new category, the XXL category. The reasons for this policy choice are that the municipality wants an acceptable and affordable programmatic mix of social and commercial functions. Economic reasons also play a role: the municipality wants to guarantee the financial feasibility of adding quality to the public space. The city center area concerns the former city of Eindhoven, before 1920. This differs from the focus area from the document of 2008. The VBE is an elaboration of the 2008 high-rise policy, to which it is complementary. The vision is also an elaboration of the Omgevingsvisie

Eindhoven: kloppend hart van Brainport and Binnenstadsvisie Eindhoven (Gemeente Eindhoven, 2020).

4.2 Densification vision

In the **Verdichtingsvisie Binnenstad Eindhoven** the municipality of Eindhoven has defined several types of high-rise residential buildings. To make this research not more complicated, the definitions used in this vision document will be adopted in this research.

The municipality of Eindhoven has adopted three 'layers' in which buildings can be defined. The first layer is the Eindhoven layer, these are buildings with a maximum height of 17,5 meters. These buildings define the daily view of the city. The municipality wants to maintain the qualities of this area, such as the historic buildings of the city centre.

The second layer is the Brainport layer. If buildings are higher than 17,5 meters they will belong to this layer. The implementation of the Brainport layer is only possible in special designated areas inside the city center. These areas are designated on the map in image 3. Buildings that reach a height into the Brainport layer need to be of a diverse collection of shapes, materials and facades. These buildings will give status to the city and need to give an image to the 'Brainport Eindhoven'. Densification in these areas is accepted following the next forms:

- Adding new volumes as a superstructure on the existing Eindhoven layer, making each building different
- Complete new construction, with an Eindhoven layer and a distinctive volume in the Brain port layer
- Densification of courtyards in combination with greenery.

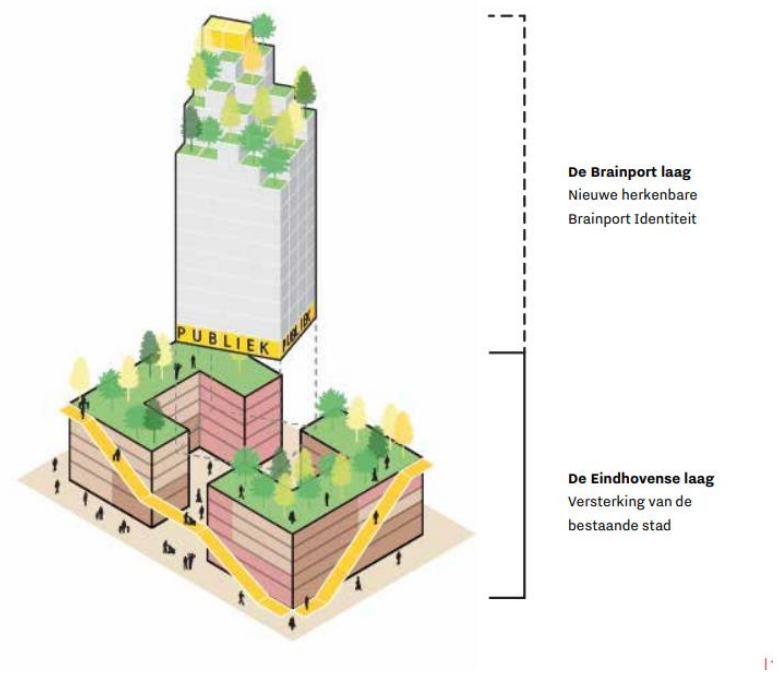


Figure 8, (Gemeente Eindhoven, 2020)

As shown in figure 8, Eindhoven identifies buildings over 17,5 meters with as buildings with a different status. This research will focus on the implementation of buildings higher than 17,5 meters, and therefore only buildings that are inside the Brainport layer inside the city centre of Eindhoven (Gemeente Eindhoven, 2020).

The municipality maintains a third strategy for special buildings. These are buildings on special places, such as the town hall area. These buildings need to become the new icons of the city. These projects will be programmed with customization (Gemeente Eindhoven).

The VBE has been established through collaboration between the municipality, developers, residents and interest groups. The process of collaboration and consultation started with some information-evenings for residents, entrepreneurs and interest groups. There has also been an open debate and the possibility to send in a written response on the plans made. This process changed the plans a bit, for instance in relationship to more contiguous greenery, the importance of good programming for the facades in residential towers, and about the decision-making follow-up process Stadhuisplein.

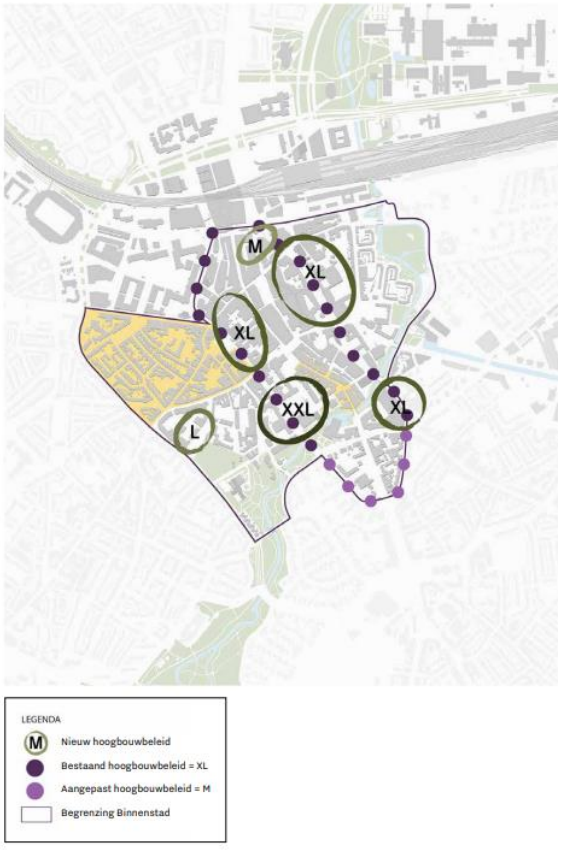


Figure 9, (gemeente Eindhoven, 2020)

The municipality of Eindhoven has four types of areas for high-rise residential buildings inside the city centre (Gemeente Eindhoven, 2020).

- (M) max. 45 meters
- (L) max. 70 meters
- (XL) max. 105 meters
- (XXL) max. 160 meters

4.3 Locations

In the VBE the municipality has identified eight locations for new high-rise development: Binnenterreinen Demer (M), Heuvel (XL), Hoek Vestdijk/Kanaalstraat (XL), Hoek Vrijstraat / Rechtestraat (XL), Nieuwe Bergen (L), Stadhuisplein (XXL), Schellensterrein (XL) and VDMA (Xl). The locations about which more knowledge exists , concerning what kind of development will take place there, will be highlighted below:

Figure 10, (gemeente Eindhoven, 2020)

Heuvel (XL)

The Heuvel is currently a shopping mall inside the city centre of Eindhoven. There are plans to give the plot a total makeover in architecture and mix of functions. The plan also provides for functions such as shops, homes and a hotel. Six hundred to a thousand homes will be housed in three new residential towers. The covered passages of the shopping centre will be opened up, creating streets. Partly because of this, the complex also connects better to important squares and other cultural buildings in the area. The plans are made by MVRDV, a company owned by former supervisor on

urban planning in Eindhoven, Winy Maas. Most of Maas' plans are withdrawn and reframed in new, more realistic plans.

Nieuwe Bergen (L)

The Nieuwe Bergen is a development project with 237 owner-occupied and rental homes (social and medium-priced). There will also be shops and an underground parking garage. In this area people can work, relax, meet each other and shop. This project is the only project already under construction within the area of the VBE. It is one of the few prestige projects by top architect and former supervisor Winy Maas that will be realized. The project has been postponed for a long time by objection procedures regarding parking. As shown in the housing monitor, the number of affordable rental and owner-occupied homes will remain limited. This is because the project had already been established before the VBE and the 85% affordable scheme had been adopted. Respondent 10 claimed that the developer of this project wanted to start the construction of this project in these difficult times because it felt an obligation to the municipality of Eindhoven and its citizens (interview, respondent 10, 15-05-2024). It is viewed as a prestige project, and the real estate developer wants to show the city that it is a reliable partner, by launching the construction in economically difficult times. Therefore, respondent 10 indicates that the Nieuwe Bergen project will be realized in accordance with the 2017 tender (interview, respondent 10, 15-05-2024). It is the first project started within the boundaries of the VBE. The tender for this area however has been done before 2020 and the determination of the VBE. Therefore, the project consists of different agreement conditions then projects that (will) start after the determination of the VBE.

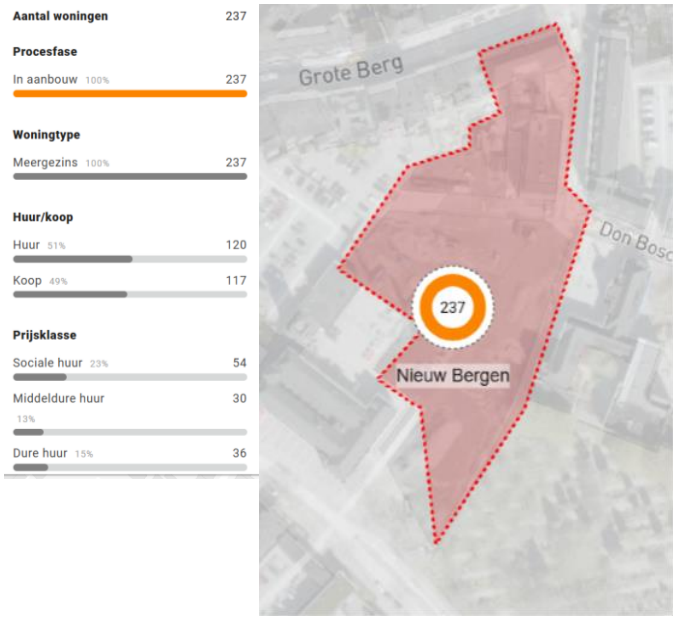


Figure 11, Nieuwe Bergen project. Source: woningbouwkaart Eindhoven (2024)

Schellensterrein (XL)

Construction of Schellensterrein has started at the site of the Schellens factory in the centre of Eindhoven in 2023. The monumental part of the old factory is being redeveloped and a spectacular

residential building with 350 rental homes will rise above. The design was made by Diederendirrix architects.

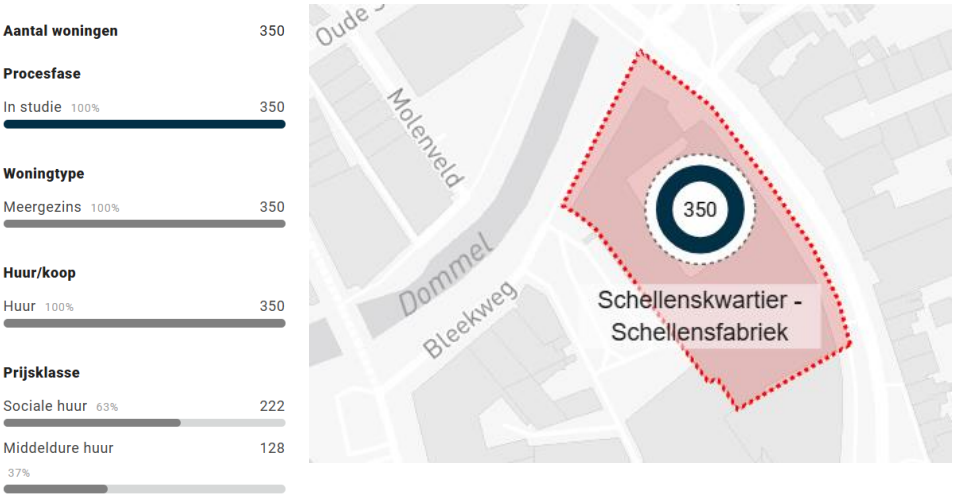


Figure 12, Schellensterrein project. Source: woningbouwkaart Eindhoven (2024)

Stadhuisplein (XXL)

The Stadhuisplein area has caused the most discussion in Eindhoven. At first plans had been allowed for the building of towers up to 160 meters. Later the municipality has reverted on that decision. Due to long lasting objection procedures, the bankruptcy of an investor/developer, the need for cooperation between developers, uncertainty in the height of building costs and additionally sustainability demands of the municipality, there is still no development going on in this area.

The ambition of the area, as described in the area vision, is to add new buildings around the square to serve as a 'grandstand' around the 'stage' of Town hall and the square. The buildings will have a special architectural appearance and together form the walls of the newly designed Stadhuisplein. The idea is to create plenty of space for living, for all target groups. The height of 160m (XXL), as mentioned in the VBE, does not fit this new concept, because it requires mutual coordination instead of solo buildings. Therefore, the new maximum height will be 105 meters (XL) (Gemeente Eindhoven, 2023).

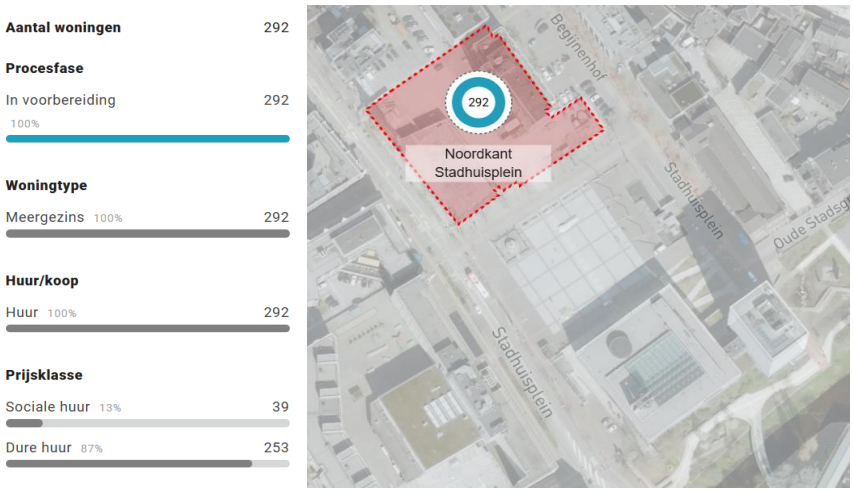


Figure 13, Stadhuisplein project. Source: woningbouwkaart Eindhoven (2024)

VDMA (XL)

The VDMA project was also realized through a public tender. The municipality itself included the parking lot as land. The project, like most projects in the city centre, is 'in preparation'. For the VDMA area the plans have also already been presented. There will be 793 homes for a variety of target groups, including students, young professionals, small households, families, expats and empty nesters. Development is yet to be started.

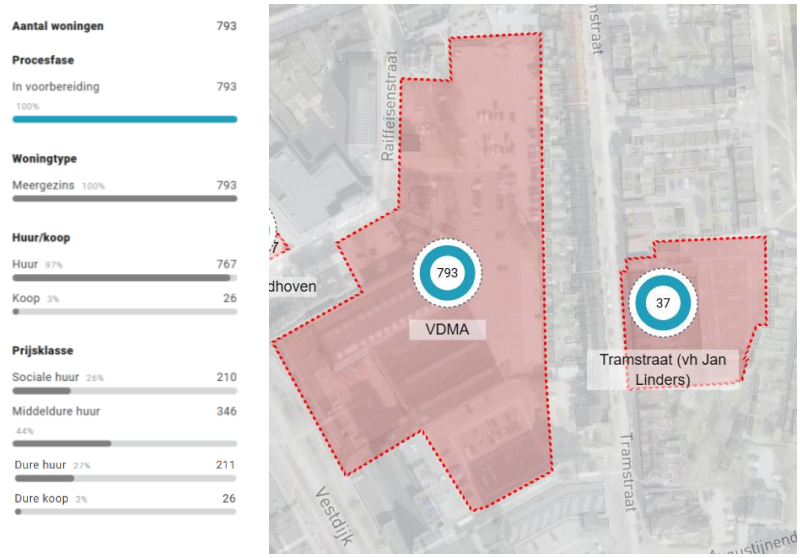


Figure 14, VDMA project. Source: woningbouwkaart Eindhoven (2024)

4.4 Zoning plan

As discussed before, the rules for objects in the physical living environment, including buildings, have been stated in the ‘Omgevingsplan’ the Dutch zoning-plan. In Eindhoven there is a temporary zoning-

plan, which exists of all existing ‘Bestemmingsplannen’. These rules are legally valid until 2032, by then the municipality of Eindhoven plans to announce the new zoning-plan.

The area’s restricted in the VBE are adopted in the ‘Bestemmingsplannen’ for the city centre. Therefore, the rules that have been discussed earlier in this thesis, are legally binding. According to the rules of the Bestemmingsplannen the following rule has been stated for the height of a building:

The maximum gutter height and maximum building height of buildings within the building area: as existing unless otherwise indicated in the illustration;

4.5 Ontwikkelingsperspectief centrum Eindhoven

To meet the challenges of a more densified city centre, the municipality of Eindhoven has identified several practices that need to be implemented alongside the eight locations for HRRB in the city centre. These practices are stated in the ‘Ontwikkelingsperspectief centrum Eindhoven 2040’. To keep the city permanently liveable despite the major changes that the implementation of HRRB bring the municipality of Eindhoven wants to:

1. Consider urbanization, green water and mobility in conjunction, to make a quality leap towards a healthy and vital city
2. Inside the city centre is room for 3700 new homes
3. The city centre needs to become car-free, which means a big mobility transition will be needed for the city centre.

To implement policy on a specific topic like HRRB, it is needed that overarching policy documents, like the Ontwikkelingsperspectief centrum Eindhoven 2040, secure other interests like mobility, parking, greening etc. (Gemeente Eindhoven, 2020).

4.6 Area vision's

In addition to the densification vision, the municipality of Eindhoven has made so called ‘Gebiedsvisies’ (Area visions) for several areas within the VBE. The most important area vision that already has been presented is the one for the Stadhuisplein area. The area vision is more specific and has been established through better cooperation with the interest groups and developers than the VBE, according to the concerned actors.

4.7 Eindhoven bouwt door

An important tool that will stimulate current practices in the next years is 'Eindhoven bouwt door'. This tool is a consultation table on which the municipality and developers can make arrangements that overrule terms in vision documents, with the purpose of accelerating the development process. Examples are abandoning the 85% affordable housing rule or other quality requirements for residential towers. This allows the municipality to assist developers in completing the business case of their project in these difficult times. In this way, the municipality of Eindhoven has ensured that legislation and regulations could also have a positive influence on the construction process in the future.

4.8 HOUSING FUND

Another tool that also can be seen as a resource is the so-called 'Woonfonds' or housing fund. It has not officially been started yet, but the idea is that there will be a housing fund in which big companies can invest money. This fund is/will be mostly funded by tech giant ASML that requires to house its employees in the Brainport area. With this money ASML and other companies guarantee for loans from the bank made by developers to start more housing projects in the area.

4.9 ACTOR CONSTELLATION

To understand which factors, have effect on the decision-making process, it is needed to understand the (power) relations between actors in the planning system of Eindhoven.

4.9.1 MUNICIPALITY

The municipality is the most important actor in the decision-making process because it is the competent authority to approve policy documents. The municipality has a supervising and controlling power over real-estate developers because it makes the policy on HRRB, and can therefore messured the zoning plans against their policies, according to respondent 10 (interview, respondent 10, 15-05-2024). The municipality could have had a stronger position of power by owning land plots in the city centre, but this isn't the case in Eindhoven because the municipality doesn't own much land in the city centre. To overcome this issue the municipality is using a tool called 'Voorkeursrecht Gemeente' (Municipal Preferential Right). With this tool the municipality can impose a preferential right on a specific piece of land. The owner is therefore obliged to first offer his or her land to the municipality if he wants to sell it.

Respondent 8:

Until a few years ago we did not use legal instruments, such as the Municipal Preferential Rights Act. We simply did not establish them and that made it very difficult to obtain land positions. So, market parties were simply ahead of you as a municipality. But you can now see that we are much more active on the market, so we have now established about 6 or 7 areas under the Municipal Preferential Rights Act. And because of this location, we have also been offered many more plots of land and have been given the opportunity to acquire many more plots (interview, respondent 8, 03-05-2024).

The municipality exists of civil servants, the college of B&W and the city council. The civil servants are professionals in their field, the city council are elected representatives. Because the councilors are elected by the people, they feel the responsibility to do their actions on behalf of the people. There is political pressure on the councilors because new elections take place every four years.

An important individual who has left his mark on the current policy is former supervisor Winy Maas. The architect had very ambitious and, according to some, too futuristic, almost utopian plans for Eindhoven. Many respondents I spoke to did not share Winy Maas's vision. Ultimately, many of his plans were reversed, for example the height of the buildings and his design of the town hall square, and his design of the VDMA project.

4.9.2 MARKET PARTIES

Real-estate developers play an important role in the planning system of Eindhoven. The municipality of Eindhoven is depending on developers to carry out their plans. Because real-estate developers own much of the land plots within the city centre of Eindhoven, they have a position of power against the municipality. A municipality can make very ambitious plans, but according to several respondents, the business case of developers does not yield a profit due to different current market conditions. Therefore developers will want to renegotiate about certain requirements, for example the quality requirements of a residential tower (interview, respondent 10, 15-05-2024; interview ,respondent 7, 2-05-2024). This process takes a lot of time, and in all that time no development will start. For municipalities it is difficult to estimate whether the budget- tender presented by the developers is realistic or exaggerated to make more profit. Housing associations do not act with a profit motive, therefore the municipality can trust them better.

Housing associations compete with real estate developers for land positions in the centre of Eindhoven. Due to the ambitious plans, land costs in the centre of Eindhoven have increased. According to respondent 9, housing associations in Eindhoven have a lot less capital capacity than real estate developers and therefore have a disadvantageous position of power in that respect (interview, respondent 9, 08-05-2024).

In the case of Eindhoven, two types of developers are identified: local developers and international developers. According to employees of the municipality it is harder to make agreements with international developers because these parties have no connection with the city. There is also the risk that a developer will quickly resell the project.

"You also have international developers. Then it is difficult, because then you get, Oh yes, we will build that, then the building will be sold to an end investor and then they will be gone again. So those are often the most difficult conversations because as a municipality we are here for long-term quality. And if they sell it immediately, that doesn't bother them of course" (interview, respondent 1, 15-04-2024).

Local developers feel a certain responsibility towards the city to deliver a good project. On the one hand, this is a result of the bond they have with the city, and on the other hand, with the status they want to maintain. Local developers in Eindhoven want to maintain a good relationship with the municipality and are therefore more willing to make concessions. In return, they hope to have early access to upcoming projects because they have a good reputation in the city.

Contractors are companies that construct a building. In some cases, a contractor and a developer are part of the same parent company, but in some cases, these are separate companies. In Eindhoven there are few or no contractors that have the knowledge, expertise or time to build a tower above 100 meters. This partly causes the development process in Eindhoven to be slow.

ASML and other tech-giants also play a part in the planning system. This is due to their investments in the upcoming housing fund. With this they guarantee loans from developers so that construction can be completed faster. However this does create a relationship of dependency between these companies and developers.

"They are working on a housing fund, which is mainly sponsored by ASML and put into that housing fund there. ASML is investing a few million in this to actually guarantee against setbacks. look at most,

the system works like this. Most developers have no money themselves.....we are now negotiating: Municipality with ASML and those developers. With ASML will probably not actually invest so many million, but that they will guarantee against setbacks" (interview, respondent 3, 19-04-2024).

4.9.3 CITIZENS

Citizens can have an indirect influence on the decision-making process on HRRB by voting in the municipal elections. Because councillors in the municipal council are elected by the citizens, they are also accountable for their policy choices to these citizens according to respondent 7 (interview, respondent 7, 02-05-2024). This creates a relationship of interest between both parties.

Citizens can also try to have influence on the decision-making process directly by lobbying for their concerns through interest groups. This is done by talking to politicians, submitting 'zienswijzen' and objection procedures for plans, participating in participation processes and influencing the public debate through the media. According to several respondents, both the heritage foundations (opponents of the plans in theVBE) and EHVXL (proponents of the plans in theVBE, they even are in favour of expanding the HRRB plans) have influenced the decision-making process (interview, respondent 1, 15-04-2024; interview, respondent 2, 15-04-2024; interview, respondent 6, 30-04-2024, interview, respondent 7, 02-05-2024).

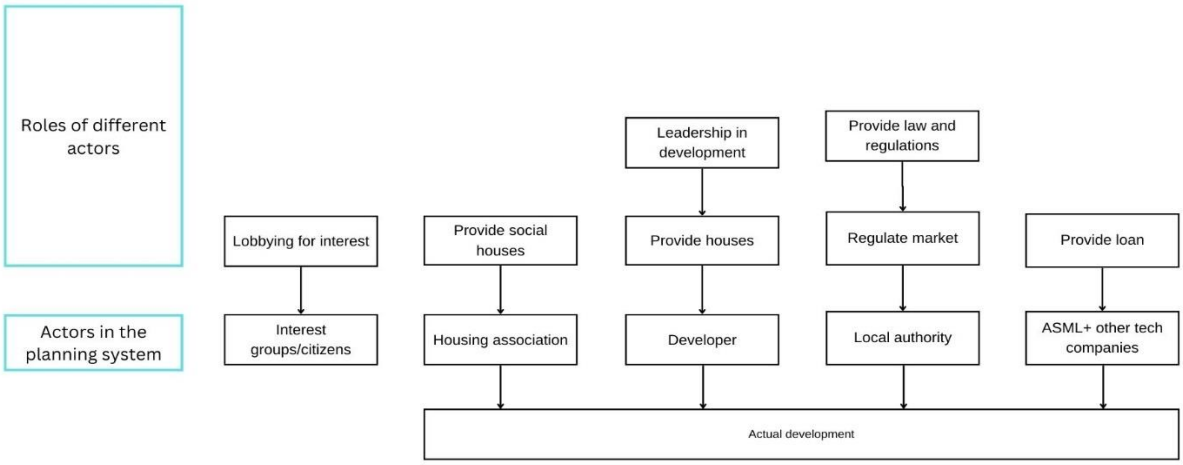


Figure 15, Author's own

Figure 15 illustrates the actors involved in the planning system of Eindhoven and their role within the planning system.

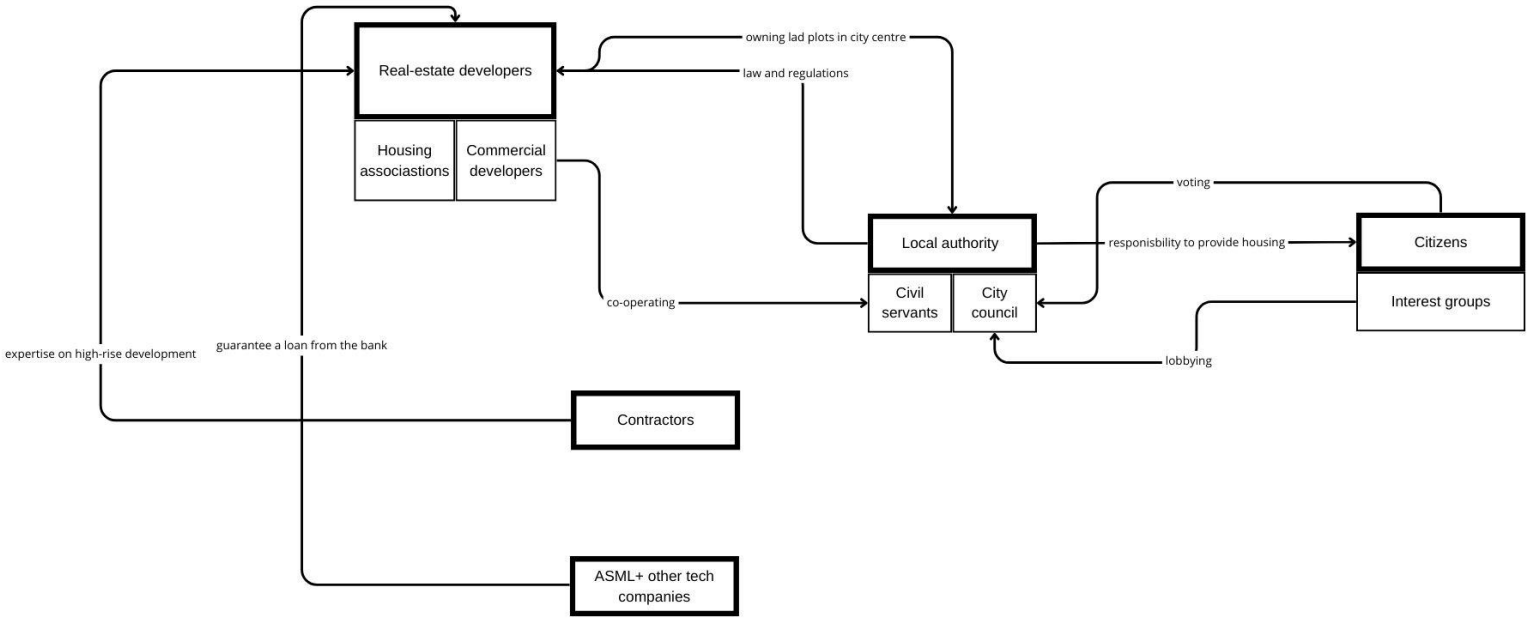


Figure 16, Author's own

Figure 16 provides an overview of the power relations between actors mentioned in this chapter.

5. RESULTS

In this chapter the results of 10 semi-structured interviews, conducted from experts and professionals with a connection to the HRRB policy in Eindhoven, will be analysed.

5.1 DISCOURSE WITHIN THE CITY

The need for densification and finding a suitable solution for it, is a spatial planning issue. However, the issue on the implementation of HRRB in Eindhoven is more than just a spatial planning issue, it is also a social-political issue. According to the conducted data, there are several discourses on how the city of Eindhoven should take shape.

5.1.1 GENERAL DISCOURSE ON DENSIFICATION

The dominant discourse on densification in Eindhoven corresponds to that of the rest of the Netherlands. According to respondents, there is a need for densification because there is a big housing shortage in combination with a lack of space.

"The city has become very popular due to the Brainport region, so there are many people coming this way. This means we need lot's of new housing" (interview, respondent 9, 08-05-2024).

In Eindhoven, this lack of space is because there is hardly any space left at the outer limits of the city to build large residential areas with low-rise buildings.

“We have no space for more neighborhoods, we are totally built-in by other municipalities”(interview, respondent 1, 15-04-2024).

“We can't expand outside our borders, so we have to do it within the city centre”(interview, respondent 2, 15-04-2024).

The municipality could have chosen to sacrifice nature and greenery for new brownfield locations, but the municipality does not choose to do so. The municipality sees nature as something that must be preserved, and that is why it sees infill as a solution. The municipality of Eindhoven differs from other large municipalities in the Netherlands in not having gone through a major reorganization. Other municipalities have acquired a lot of extra land by merging with smaller neighborhood municipalities. Concerning the form of densification that Eindhoven chooses, they join the national dominant discourse , as mentioned in the interviews. According to several respondents, Eindhoven does not opt for densification according to the Barcelona model (many buildings of 5 to 6 high) because then a lot would have to be demolished (interview, respondent 1, 15-04-2024; interview, respondent 2, 15-04-2024). That is why Eindhoven opts for a combination of topping and residential towers. Topping up is only possible to a very limited extent in the center of Eindhoven, which is why residential towers are mentioned as a solution to supplement the housing stock. The design of these residential towers is in line with the general discourse on residential towers, namely narrow, easily accessible residential towers. The contrast between big buildings and small houses has always been a part of ‘company town’ Eindhoven, and therefore it would suit the city.

“Eindhoven is a city with huge contrasts, always has been. Philips put down huge fabrics next to their own neighbourhoods with small houses. Eventually this contrast has become part of the character of the city” (interview, respondent 1, 15-04-2024).

Respondents indicate that these residential towers must be habitable for a broad social audience, not just for the rich (interview, respondent 1, 15-04-2024; interview, respondent 9, 08-05-2024). That is why the municipality has also introduced an 85% affordability scheme for new houses. A widely shared opinion among respondents to the interviews, as well as among civil servants, developers and interest groups, is that high-rise buildings are necessary to meet the city's densification task.

The expected population growth in Eindhoven is mainly caused by the popularity of the Brainport region. This popularity is mainly due to ASML and other tech companies that are growing very fast and want to expand. This attracts many (well-paid) employment opportunities, which creates a high demand for housing in Eindhoven. In combination with the lack of space, the decision was therefore made to use high-rise buildings as the main technique for densification in the city centre.

5.1.2 *IMPACT INTEREST GROUPS*

After conducting the interviews, a striking image emerged of the heritage interest groups. According to several respondents, these interest groups (the Van Abbestichting and Stichting Wederopbouw) only present a small scale of the population, but have had and still have a huge influence on the decision-making process and the implementation of HRRB in the city centre of Eindhoven (interview, respondent 1, 15-04-2024; interview, respondent 7, 02-05-2024).These interest group consists of older men, often retired, well-educated and with a lot of knowledge about the field. These interest groups know very well how to find their way to the municipal council to lobby for their interests, and they also know how to find their way to the local media to influence the political debate in their favour.

"Interest groups, You have a number of 3 or 4 in Eindhoven, which consist of men, often white, who have the time, who also have had a good education, who know their way into both the press and politics and therefore it seems it is as if, first of all, they represent a large group. But at least they have an important voice that really get in the way of progress. By simply entering into real procedures, to prevent development and that takes a lot of time" (interview, respondent 7, 02-05-2024).

According to respondent 5,the interest groups are in favour of preserving Eindhoven's heritage and are therefore against most of the municipality's high-rise plans *(interview, respondent 5, 30-04-2024).* They have delayed the process of drawing up the densification vision with various objection procedures. According to several respondents, the heritage interest groups also influenced a variety of decisions, such as reducing the maximum permitted height on the Stadhuisplein and blocking a high-rise location along the Dommel (interview, respondent 2, 15-04-2024; interview, respondent 7, 02-05-2024).

5.1.3 *CIVIL SERVANTS AND THE CITY COUNCIL*

Another remarkable relationship in the political debate is the relationship between the municipal council and civil servants. The municipal council is the competent body to approve policy documents. The substantive consideration and preparation of the documents is the task of the civil servants. The civil servants have received training in drawing up municipal policy and are professionals. Municipal councillors often have no background in spatial planning or urban development, so they often lack the knowledge about certain matters that civil servants do have, according to several respondents (interview, respondent 5, 30-04-2024; interview, respondent 7, 02-05-2024). In a well-functioning system, the municipal council approves the balanced assessment of its civil servants. However, the municipal council appears to be sensitive to the opinions of residents (who elect the municipal council). An example of this is the lobbying of heritage foundations. Where civil servants make a well-thought-of decision in consultation with real estate developers and housing associations, the municipal council sometimes makes different choices for the sake of possible political gain. This power relationship causes friction in the decision-making process.

"At a certain point, the arguments did not matter, the substantive arguments such as plans, also were pushed aside to some extent, huh? Because political arguments came into play, namely the arguments of: We don't want high-rise buildings in our backyard, because there is a lot of resistance from a certain neighbourhood and you can almost never win against those political arguments. Never 100% on the content"(interview, respondent 2, 15-04-2024).

5.2 IMPLEMENTING DOMINANT DISCOURSE IN PLANNING STRUCTURE

To ensure that the dominant discourse on densification ultimately leads to actual development, the municipality of Eindhoven had to implement this discourse in the overall planning structure. This has been excucuted through various laws and regulations. Respondents mention the municipality's housing program with an 85% affordability scheme, the inclusion of a low parking standard in the environmental plan for the city center and the start of a participation process for the densification vision. In this way, the municipality of Eindhoven is securing the foundation for new policy. With the participation process and the inclusion of consultation responses, views and objection procedures, the municipality of Eindhoven affirms the legal basis for a tool to stimulate the construction of HRRB. This basis is now being further expanded by placing a municipal preferential right on various land (in the municipality, not in the city center) and negotiating with ASML and real estate developers about starting a housing fund.

Something the municipality has not yet been able to do is speeding up the procedures. It irritates respondents from the real estate sector that these processes take a lot of time. According to these respondents, it is also in the interest of the municipality that this will happen faster in the future. Otherwise, these respondents do not expect the municipality's 2030 housing goals to be achieved.

5.3 POLICY EVALUATION

To ultimately arrive at the tool for the VBE for the city center of Eindhoven, the municipality has evaluated the policy. Decisions are made in this process. This process has been analyzed based on the four themes from the conceptual model.

5.3.1 ENVIRONMENTAL FACTORS

Eindhoven is a city with a predominantly left-wing vote. The importance of environmental factors is therefore high on the agenda of the current municipal council. This approach has influenced HRRB policy in Eindhoven in various ways. For example, rules have been included in the policy regarding the amount of m2 of green space per dwelling, the municipality encourages circular construction, and the municipality does not want to sacrifice nature for new homes.

Creating a healthy and practical living environment is also high on the agenda of the municipality of Eindhoven. According to respondent 1, implementing high-rise buildings will result to more people living in the centre, which could create more support for facilities (interview, respondent 1, 15-04-2024). This could increase the quality of life and social control in the centre. It could also ensure that mobility use can become more sustainable. According to respondent 6, if all facilities are closerby, people are more likely to cycle or walk (interview, respondent 6, 30-04-2024). Investments can also be made in public transport because there is sufficient support. Ultimately, Eindhoven wants to move towards a car-free city centre. There is also criticism of this vision of the municipality. Respondent 5 from the interest group indicates that there is far too little parking space in the centre. It would be made impossible for people to own a car (interview, respondent 5, 30-04-2023). High-rise buildings influence the living environment of a city. For instance, residential towers can cause wind nuisance, which affects the living environment in the city.

And the wind is, It is a very difficult factor, also we now have that one tower. It is now called social hub. When you walk out of the station to the left, yes, there is a lot of wind nuisance there now, because the tower is completely alone (interview, respondent 3, 19-04-2024).

The municipality therefore examined models of proposed housing projects in a wind tunnel and try to adapt them so that they does not cause any wind nuisance. Only then will the permit be issued. A possible solution mentioned to the wind problems is placing a power nest on top of a building. According to respondent 3, this has a positive effect on the wind.

"A lot of people want that now (powernest). This means that the wind does not fall directly behind the tower. Normally the wind goes, so it falls behind a tower, which creates a kind of vacuum behind a tower, which actually pulls the wind back downwards. but because of that power nest, that wind is streamlined a bit into that in that intermediate layer, so that it goes straight ahead and not downwards"(interview, respondent 3, 19-04-2024).

There is also criticism on not including certain environmental factors in the HRRB, energy and heat. Where the municipality indicates that it is focusing on sustainable energy in the residential towers and wants to stop using gas, the interviews indicate that no thought is being given to the possible overload of the electricity grid. The policy also contains little about sun protection. Respondent 6, former member of EHVXL, noted that this lack of sun protection could lead to overheating in high-rise apartments. This heat could lead to the purchase of air conditioning in residential towers. This could cause a lot of energy consumption and an even greater burden on the Brabant electricity grid, which already has been overloaded in 2024 (interview, respondent 6, 30-04-2024).

5.3.2 *POLITICAL/GOVERNMENTAL FACTORS*

Laws and regulations have influenced the duration of the decision-making process. The procedures for objection and appeal against visions and zoning plans are time-consuming in the Netherlands. If an objection is rejected by the administrative judge, the prosecutor can lodge another objection with the 'Raad van State'. This means that objection procedures can sometimes take a year to two years. There have also been delays in drawing up the densification vision due to objection procedures.

As mentioned before politicians in Eindhoven are sensitive to lobbyists. Lobbying by interest groups has led directly to some changes in the policy on HRRB. For example, to not to include a location along the Dommel in the high-rise policy, and to change the maximum height on the town hall square from 160 to 105 meters.

Politicians feel the responsibility to create a sufficient housing stock in the city center of Eindhoven. To achieve this, things are not always looked at from an urban planning point of view. Respondent 6 from the municipal council indicates that it is a problem to use the maximum permitted height on the town hall square. 'This means that another 30% of additional homes can be added'. Other respondents with an urban planning profession indicate that buildings higher than 105 m are not desirable from an urban planning point of view. Market-oriented factors are not even taken into account at this point.

5.3.3 *MARKET CONDITIONS*

According to several employees of the municipality of Eindhoven, market conditions have not been taken into account when formulating the densification vision of the city centre (interview, respondent 1, 15-04-2024; interview, respondent 6, 30-04-2024). A missed opportunity, according to several

respondents of interest groups and developers (interview, respondent 7, 02-05-2024; interview, respondent 9, 08-05-2024).

The possibilities to build higher ensure a higher residual land value. If development subsequently must be postponed or adjusted due to various (market) circumstances, it could lead to developers ultimately paying too much for the land. Developers will want to compensate for this in the business case. This can make a project more difficult to start (interview, respondent 5, 30-04-2024; interview, respondent 10, 15-05-2024).

According to several respondents, another market condition in the real-estate market is that construction costs have risen significantly in recent years. This means that developers have smaller margins and sometimes need to scrap quality requirements to complete the business case. The VBE does not respond to this, but the recently launched tool from the municipality 'Eindhoven bouwt door' is a new policy that does acknowledge this issue (interview, respondent 1, 15-04-2024; interview, respondent 2, 15-04-2024; interview, respondent 3, 19-04-2024; interview, respondent 4, 25-04-2024).

Another market condition that hasn't been considered when formulating the VBE is the limited number of contractors that can build a tower higher than 100 meters in Eindhoven. This is remarkable since the municipality of Eindhoven does allow this height in many places, but seems unaware that such a development will be difficult to execute under these market conditions (interview, respondent 5, 30-04-2024; interview, respondent 7, 02-05-2024).

5.3.4 SOCIETAL FACTORS

Psychological effects such as loneliness are not mentioned in the VBE, but are mentioned by respondents in the interviews. The municipality recognizes the risks of loneliness in residential towers and would also work with housing associations and developers to combat this possible loneliness. So even though this cannot be deduced directly from the policy, respondents indicate that this was indeed a factor that influenced the decision-making process surrounding the implementation of residential towers in Eindhoven. An example of this is drawing up a quality requirement for implementing communal areas in residential towers (interview, respondent 3, 19-04-2024; interview, respondent 9, 08-05-2024).

The municipality of Eindhoven is consciously concerned with the constellation of the population in the city centre. The municipality in co-operation with the housing associations wants to keep living in the centre affordable. This should ensure that people from all social classes have access to living in the centre.

“We think it is important that that it (the housing policy) is inclusive and that it is for everyone and not only for the happy few” (interview, respondent 9, 08-05-2024).

However, according to developers, this is a problem. It affects their business case negatively. Respondent 7 stated that developers will, for example, opt for smaller apartments , to complete their business case. Respondent 7 is therefore convinced that the municipality of Eindhoven will eventually abandon the 85% affordability scheme (interview, respondent 7, 02-05-2024).

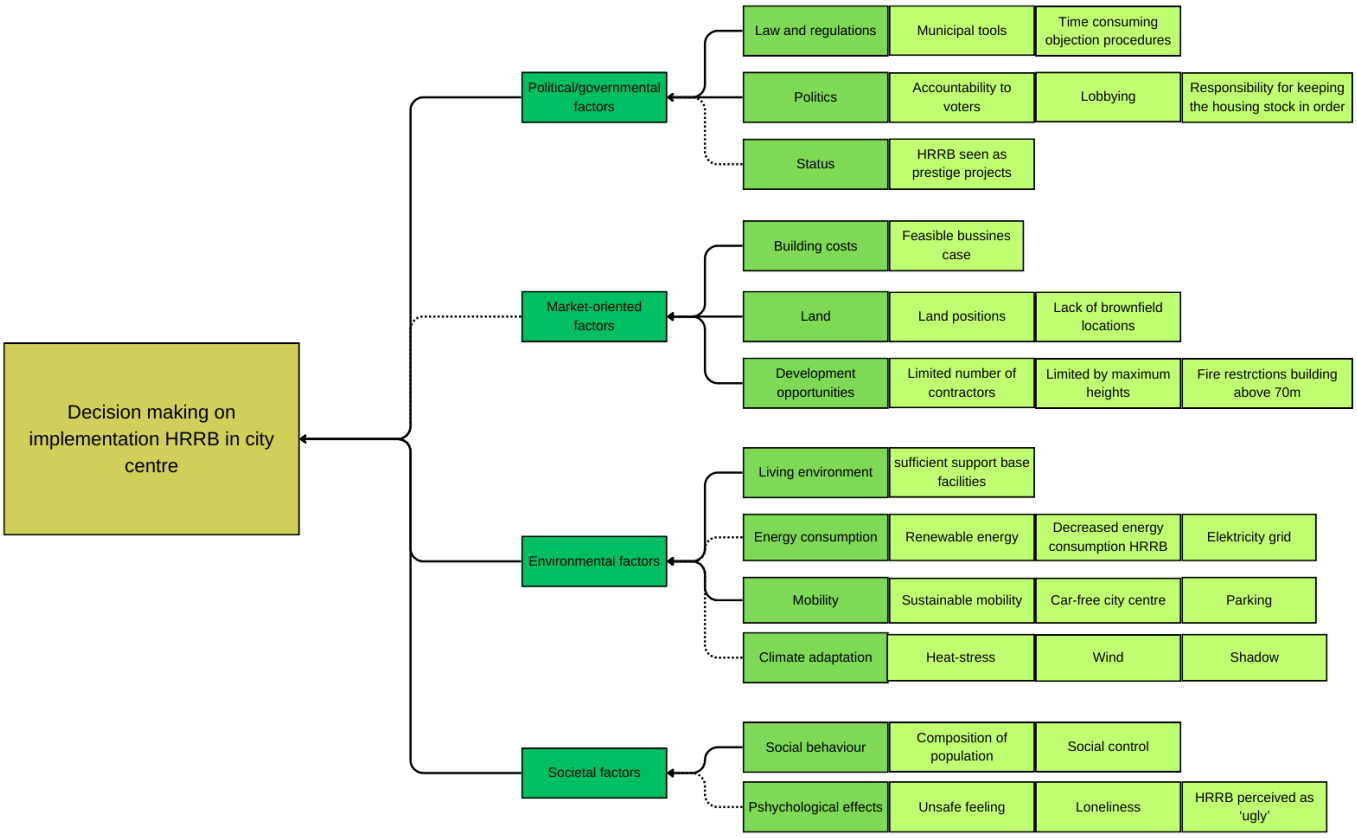


figure 17, outhors own

Figure 17 indicates the identified themes and the mentioned sub-themes during the interviews. a dotted line means that a factor was mentioned during the interviews, but it cannot be demonstrated by the collected data that it had an influence on the ultimate policy regarding high-rise buildings

5.4 Discussion about planning practices

From the interviews it can be concluded that the actual construction of new residential towers is still in preparation at almost all locations. This can also be concluded from the housing monitor of the municipality of Eindhoven, which was referred to by respondent 7. Only the Nieuwe Bergen project has started construction.

The VBE has ensured that developers, in a certain sense, know their position in the centre of Eindhoven. The problem is that area visions can deviate from, for example, the maximum permitted height, as happened with the city wall project on the town hall square. The policy has also not prevented objection procedures against projects. Respondents 7,9, and 10 (developers) also indicate that they regret that market conditions have not been considered when formulating the policy (interview, respondent 7, 02-05-2024; interview, respondent 9, 08-05-2024; interview, respondent 10, 15-05-2024).

However, this is a very difficult issue to do. Creating policy takes time, especially if many views and objection procedures are submitted against the policy itself. Respondents from the municipality indicate that major changes have taken place in the world during the writing of the policy. Both the corona crisis and the war in Ukraine have influenced market conditions in the real estate sector, for

example, rising construction costs (interview, respondent 2, 15-04-2024; interview, respondent 9, 08-05-2024).

The densification vision has a number of locations where buildings can be built higher than 100 meters. Respondents mention a problem that occurs when building to these heights. The problem with building above 70 m is that according to the fire decree an additional fire escape is needed. This reduces the gross floor area on each floor that can be used for apartments. It is difficult to say at what height this is recouped because every project differs, but respondents mention a height between 100-120 meters. These regulations make it a lot riskier and therefore unattractive for developers to build above 70 meters.

Of course you always have elevators in a building, but they don't count, because if there is a fire you are not allowed to use the elevator, right? So you always have one escape staircase in a normal building up to 70 m. So you have an elevator shaft that you normally always use as long as there is no fire and you have an escape staircase, but that escape staircase is actually in terms of. In the floor plan it is approximately the same size as the elevator shaft. Hey, so you already have that twice. And yes, those aren't all meters that you can spend as apartments, are they? If you go above 70 m, you have to build a second escape staircase, right? That, well, that suddenly increases the costs enormously. So it is very unfavourable to build, say, higher than 70 m, isn't it? That you have to make that second escape staircase. But yes, you don't have any extra revenue. Well that turning point in economical feasibility is 100 m, so you actually see almost no towers between 70 and 100 being built in the Netherlands now (interview, respondent 3, 19-04-2024).

The other problem with building above 70m is that the number of contractors that can build a tower of 100-160 meters is very limited. There are none available in the Eindhoven area, so if a developer wants to build a large tower, he or she must look for a contractor in the Rotterdam area (which in turn entails additional transport costs).

Look, there are a few large contractors in the Netherlands who can handle this type of project in terms of height, who only have the knowledge and experience and who currently have so much other work in the Randstad. That is not yet the case here in Eindhoven. you have, you just need a lot of knowledge and experience to really go above 100 M (interview, respondent 7, 02-05-2024)

And the contractors who do that (go above 100m), they are in Rotterdam, right? Because that's where they have the most high-rise buildings, so contractors like those in Eindhoven have to start building. This means that every day they spend two hours in traffic jams with their things and people, then build and then go home again in traffic jams for another two hours. And that is all reflected in the costs (interview, respondent 3, 19-04-2024).

6 Discussion

6.1 How is the dominant discourse on HRRB in Eindhoven embedded in the structure of the planning system?

The dominant discourse on the need of densification in Eindhoven started with the housing crisis in the Netherlands and therefore the need for more housing. This need for housing is supplemented by the attractiveness of the Brainport region due to the high-tech industry. The municipality of Eindhoven recently announced that ASML has been allowed to expand, further increasing the need for new homes. The interviews indicate that different methods of housing construction have been considered. Densification in the centre has been chosen as the dominant discourse because there is too little space in other places in the city to expand further. In addition, many advantages of densification are mentioned during the interviews, such as broader support for facilities, more social control in the centre and the preservation of greenery on the edges of the municipality.

The choice has been made to implement residential towers as a form of densification, because other forms of densification are not considered a realistic option or add too few homes. Topping up is only possible in a few locations and adds a limited number of homes. Densification according to the Barcelona model would result in a lot of demolition, which is undesirable for the municipality. That is why the interviews indicate that implementing residential towers is the solution to the housing shortage in the centre of Eindhoven.

The Eindhoven case has largely adopted the dominant discourse on densification in the Netherlands. Jane Jacobs' (1961) argument that densification can provide a better quality of life is accepted by respondents. The argument that densification can boost the local economy and create more employment is not mentioned in the interviews. This is probably because Eindhoven already has many high-quality employment opportunities. The argument that densification can create more employment is therefore less powerful. The advantage of densification mentioned by Midu (2014), that densification can prevent urban sprawl, making people less dependent on their car, is also used by respondents.

The argument of (Drew, Nova, & Fanning, 2014) and (Zeiler, 2017), that a more vertical living and working environment is often hailed as a solution to tackle problems involving the growing cities and the continuing urbanization is also mentioned by respondents. The research by Republiq (2022) can also be traced back to the context of Eindhoven. According to respondents, the greatest development potential for the municipality of Eindhoven lies within the city borders. Research by Nabielek, Boschman, Harbers, Piek, & Vlonk (2012) indicates that infill development can create a less green living environment. The municipality of Eindhoven takes this into account with the regulations regarding a mandatory number of m2 of greenery per new dwelling. The municipality of Eindhoven does not indicate that infill was chosen because expansion is more expensive. This argument can be derived from research by PBL (2023). The municipality of Eindhoven itself owns little land in the centre, therefore the possible costs will not have been used in the argumentation. After all, development is left to the market.

The Dutch planning discourse on the implementation of HRRB as a form of infill is also largely taken over by the municipality of Eindhoven. HRRB are seen as a solution to solve problems involving the growing cities and the continuing urbanization. The New high-rise buildings, mentioned by

Wassenberg & Bugera (2024) are adapted as the dominant discourse on what kind of buildings should be implemented in the city centre of Eindhoven. These are narrow residential towers in locations where many people want to live, such as city centres with high-profile architecture.

6.2 Which factors can be identified as influential factors on the decision-making process on HRRB in Eindhoven?

Four themes have been identified from the literature that can influence the decision-making process on the implementation of HRRB in Eindhoven, political/governmental factors, market-oriented factors, environmental factors and societal factors.

Political/governmental factors

Based on the interviews we can conclude that political/governmental factors influence the decision-making process. Several respondents mentioned the influence of lobbying on the municipal council by interest groups. The advice of the civil servants has proven to be contradictory to what interest groups wanted, on a few occasions. Politicians have made several decisions based on the will of these interest groups. A good example of this is not including a location on the Dommel in the densification vision. This was advised by officials, but resistance from the population has ensured that this is not included in the densification vision. These conflicting interests in the political forcefield matches the literature of Koelemeij, van Weerdenburg & De Olde (2018).

A national trend that has also had an influence in Eindhoven is the long duration of spatial procedures in the Netherlands. This has not directly influenced the implementation of the policy, but it has had an impact on the duration of the policy making and on current practices. Status and prestige have been mentioned by respondents, however only by respondent 10 (developer), and respondent 5 (interest group). Municipal policy makers have not mentioned status as a reason for choosing high-rise buildings, so it can be concluded that status is only important for developers in Eindhoven to show future customers that they can deliver an end-product with prestige.

Market-oriented factors

According to respondents the unexpected rise of construction costs has had an impact on the business case of developers. High-rise buildings are seen in the literature as an expensive way of development (Ali & Al-Kodmany, 2012). In practice this also appears to be the case according to the respondents. This increase in costs is due to the corona crisis and the war in Ukraine. The impact of these market conditions could not be predicted by policymakers, which is why it is not included in the policy.

What is also not included in the policy are the risks for developers when developing a tower above 70 meters. The municipality uses a height of 105m at several locations, but developers indicate that this height is not desirable under current market conditions. For a tower over 70 meters, an additional fire escape is required, which leaves less space for homes. The number of contractors that can build such a tower is also limited in the Eindhoven region. These market conditions make the development process more complex but are not reflected in the policy. Respondents from the municipality also indicate that such circumstances have not been considered in the policy implementation. According to literature, if a municipality wants entrepreneurs to invest in HRRB projects the municipality needs to make it clear to possible investors that there is a possibility that a project will succeed (Ter Weeme, 2017).

Environmental factors

As mentioned before, the predominantly left-wing city council of Eindhoven has put the environment high on its agenda. This has influenced the decision-making process in the first place by picking infill instead of expansion as the dominant strategy on expanding the housing stock. Expansion would have caused the sacrifice of nature or agricultural land.

The argument that densification through infill provides broader support for facilities and can lay the foundation for more sustainable mobility (Zeiler, 2017), has been adopted by the municipality of Eindhoven. Respondents indicate that Eindhoven wants to work towards a car-free centre in its mobility policy, and that broader support for public transport, for example, is a reason to opt for infill development. It is also indicated that if people live closer to facilities, the car simply becomes 'less necessary'.

Societal factors

The municipality recognizes the risks of loneliness in residential towers according to the conducted data. This possible psychological effect is not embedded in the densification vision, but respondents mention that the municipality works together with housing associations to prevent loneliness in HRRB.

The municipality of Eindhoven is consciously concerned with the constellation of the population in the city centre. What has not been mentioned by respondents, is how different types of home seekers can find a place in the centre. The literature shows that high-rise buildings are unattractive for families with small children, for example (Gifford, 2007). This is not reflected in the response of respondents or the policy documents. According to Koelemeij, Van Weerdenburg & De Olde (2018), it is important to provide different types of housing. To put this into perspective, we will have to look at the broader picture of Eindhoven. There are many ground-level houses in Eindhoven. High-rise buildings do not immediately create a new attractive housing supply for families, but the flow of residents can ultimately lead to this. However, this cannot be concluded from the interviews that mobility will ensure a broader housing supply for everyone.

Respondents indicate that more residents in the city ensure more social control and social safety, especially in the evening and at night. This argument shows that social factors did influence the choice for densification through infill in the centre of Eindhoven.

6.3 How are influencing factors assessed and incorporated into the vision document on HRRB?

The municipality has implemented the choices made in various ways. The political concerns of interest groups have been put into a clear overview through the participation process and included in the VBE. The locations of the VBE and associated heights are included in the provisional Omgevingsplan, which makes the rules legally binding. Furthermore, many rules about greenery have also been included in the VBE. This densification vision is the ultimate translation of the decision-making process surrounding high-rise buildings in Eindhoven, and therefore largely forms the basis for actual developments. The municipality does not use proactive tools in the center such as the municipality's preferential right and active land policy, but the VBE does form the assessment framework for developers. For locations where more customization was required, such as the town hall square, separate area visions were drawn up with possibly adjusted policy. With the tool 'Eindhoven continues to build', the municipality of Eindhoven has come up with a solution to possibly work around the

current policy, as market conditions now make development in the center difficult. The same applies to setting up a Housing Fund in collaboration with ASML. All in all, the municipality uses a wide range of tools to incorporate the influence of various factors into final policy. The adaptive structure that the municipality of Eindhoven maintains, corresponds to the literature of Giezen et al (2014). Although the municipality sees the importance to close the process from time to time to move forward, the municipality uses strategic ambiguity and redundancy to make the decision-making process more adaptive.

Eventually the political/governmental, environmental, market-oriented and societal factors have all been assessed and incorporated into policy. The political factors have been assessed as important by the city council. The civil servants of Eindhoven have taken a broader look at the possible problems of a lot of resistance from the city. They have taken a solution-oriented approach with the new insights. From this they have put together a vision that is supported by a larger part of the population. To incorporate the environmental factors within the policy, the municipality of Eindhoven has included rules regarding number of m2 of green space per dwelling and circular construction. The impact of sunlight and wind has been assessed also during the decision-making process and implemented in the densification vision of Eindhoven. However, there is critique on not-implementing possible heat-stress problems. According to Ali & Al-Kodmany (2012) high-rise buildings can cause shadow problems and temperature problems within the building which can cause a rise in energy consumption. This is a point of attention for the municipality of Eindhoven. In sub-question 2 it was concluded that social factors also had an influence on the decision-making process. The fact that the 85% affordability rule has been introduced by the municipality of Eindhoven in the decision-making process is evident from the fact that the municipality has a strict policy on keeping housing in the centre affordable and therefore accessible. Market conditions have also been identified in sub-question 2 as influential factors, but they are not directly incorporated in the VBE for the city centre of Eindhoven. Failure to implement the market conditions is a direct cause of the lack of development in the city centre. In response to this, the municipality has introduced the 'Eindhoven continues to build' tool. This makes it possible to deviate from the policy in good consultation, for example the 85% affordability scheme, which has a negative impact on the business case of developers. Market conditions, through this detour, still have an impact on the policy regarding high-rise buildings in Eindhoven.

6.4 How is the Tool 'densification vision Eindhoven' used to turn plans into actual practices?

According to respondents, the VBE for the city centre of Eindhoven should be seen as an assessment framework for actual developments. The tool contributes to developments by setting clear frameworks for developers and housing associations that a development must comply with, and at which locations a development can take place. The municipality does not use the VBE to implement proactive policy. The reason for this is that the municipality in the centre does not own large land positions that are eligible for HRRB. This makes the municipality dependent on landowners at the relevant locations. The municipality does own land in other places in the city, such as district E and Strijp-S. The municipality aims to own more land in the future, which is stated by respondents and can also be deduced from the fact that the municipality has established a preferential right for the municipality at various locations.

According to respondents, the lack of actual developments is due to various market conditions such as high construction costs, a limited number of contractors, increased risk when building above 70

meters and the dependence between developers. The story of rising construction costs could not have been predicted by policy makers. According to both groups of respondents, where real gains can be made is in shortening/changing appeal and objection procedures. This takes a lot of time, and ultimately leads to the detriment of society. Society needs new, affordable housing. According to both groups of respondents, the government should therefore adjust the law and regulations to accelerate housing construction throughout the country.

Although actual practices are mainly in preparation, the design of these practices matches the discourse on ‘new high-rise' in the Netherlands (Wassenberg & Bugera, 2024). The design of the Nieuwe Bergen project can be considered architecturally high-quality, and the use of mixed function buildings on the town hall square also shows that the high-rise buildings of the future are a different type of high-rise buildings than the high-rise buildings of the 1960s.

The introduction of “Eindhoven bouwt door” and the start of a housing fund may stimulate developments in the future to start more quickly. It is not yet possible to conclude what these tools can signify for development; it is still too early for that.

6.5 RECOMMENDATIONS FOR FURTHER RESEARCH

For further research, it is initially recommended to conduct a comparable case study in several municipalities in the Netherlands. This is recommended because the research can then be better generalized to the rest of the Netherlands. A comparable case, i.e. a medium-sized municipality with limited space and a shortage of housing, and an industrial character would be a good comparable case. A relevant study can verify whether the results in this study apply to comparable cases in the rest of the country, or whether the results of this study deviate from results from municipalities with a similar character. It is also recommended to conduct follow-up research in municipalities with a different character, such as a municipality with a larger number of inhabitants, a municipality with a historic character or a municipality where there is a lot of space on the edge to build. In this way it can be determined whether these factors influence the decision-making process surrounding HRRB. These factors were not included in this research because it is a single case study.

Another interesting topic for follow-up study is the effects of the Eindhoven bouwt door- tools and ASML's Housing Fund on actual developments in Eindhoven. These tools have recently been introduced by the municipality of Eindhoven, and it is therefore not yet possible to say with clarity what the effects of these tools will be on actual developments. With further research on this subject, it can become clear whether the additional policy of the municipality of Eindhoven, and therefore the inclusion of market conditions in the policy, has a positive or negative effect on actual development in the city.

In further research into a decision process within a planning structure, it is also recommended to carefully determine in advance who you want to interview and why. Municipalities in the Netherlands are fairly closed institutions. It is difficult to obtain the correct information because within the municipality there is limited access to information for research. Developers are also unwilling to share sensitive information. In addition, it can be difficult to find the right respondents. Policy makers who make the final decision are often busy, have a high position in an organization and therefore often have less time for an interview, for example. Determining in advance which exact ministers you want

to speak to can therefore be crucial. The sooner you approach such people, the greater the chance that you can include them as respondents in your research.

7.CONCLUSION

The goal of this research was to find out which factors motivate the decision-making process on implementing HRRB in the city centre of Eindhoven. To identify these factors, this research adapted the framework of Rivolin (2012) to research the main discourses on densification and HRRB, and the implementation of these discourses within the planning system. The dominant discourse on densification that has been identified is that densification is needed to solve the housing shortage problem in Eindhoven. This densification of the city centre will be done in the form of HRRB because do not produce enough houses or involve a lot of demolition. Therefore, the municipality has adapted a HRRB strategy on several locations within the city centre. This dominant discourse has been implemented within the planning structure through legal achievement. To turn this dominant discourse into actual practices, the municipality needed to turn this legal achievement of the dominant discourse into tools that could be used as an assessment framework or a stimulant for development. The municipality of Eindhoven started drawing up a densification vision for the city centre of Eindhoven, which forms the basis for the policy on densification through HRRB in the city centre.

To draw up this vision document, an evaluation was made of what this policy should look like. During this evaluation process, four factors emerged that influenced policy making. Political factors have had a direct influence on final decisions in the densification vision and additional policy. It can be concluded that political/governmental factors have influenced the decision-making process in Eindhoven. The influence of environmental factors has been limited to certain policy rules and quality requirements for building residential towers. The data collected have shown that a lot has been discussed and considered about how the implementation of residential towers can ensure that the living environment for residents remains positive. In a world with climate change and an energy crisis, it is considered important to make sure that we can keep our planet liveable now and, in the future, even for developing a residential tower. It shows once again that the environment is a subject that planners take into account in contemporary times. Social factors have influenced the choice of densification as the dominant discourse. Creating more social safety and broader support for facilities are repeatedly mentioned as a reason for opting for densification. The municipality has also chosen to require 85% of new homes to be affordable. this social theme has influenced ultimate policy, and at the same time conflicts with the last factor, market conditions. Market conditions have not demonstrably been included in the decision-making process surrounding the implementation of high-rise buildings in Eindhoven, but have resulted in additional policy in the form of the Eindhoven bouwt door-tool and the establishment of a Housing Fund. It can therefore be concluded that all four identified factors have influenced the policy regarding high-rise buildings in some way.

With these conclusions it can be concluded that the decision-making process surrounding high-rise buildings is a complex process that is influenced by many factors. How these factors influence policy will be different for each case, but ignoring one of the four factors is not an option, because it will inevitably bring new problems. The additional policy of the municipality of Eindhoven is a good example of this.

7.1 Recommendations for practice

My first recommendation for the municipality of Eindhoven is consult with project developers about market conditions at an early stage. With this early consult, problems with the business case of developers can be identified in an early stage. The municipality of Eindhoven can then think about how market factors affect the realization of a tower higher than 100 meters. Now the 85% affordability scheme, the extra safety stairs for a building higher than 70 meters and the limited number of contractors in Eindhoven cause problems for actual development.

Secondly, I recommend that the municipality of Eindhoven include in the Omgevingsplan that it is permitted to place a power nest on top of a residential tower of an x number of meters high. With this policy rule, the municipality prevents residents from objecting to the installation of a power nest, which takes a lot of time. Because a power nest, in addition to generating sustainable energy, also has a positive effect on wind nuisance.

Thirdly, I recommend that the municipality of Eindhoven reconsiders the current policy regarding parking. With the addition of thousands of additional homes in the centre, the parking requirement will increase. However, under the current policy of low parking standards for new developments, there will not be sufficient parking for all these new residents. The fact that people do not need a car is a utopian image in today's society. The lack of parking space, in my opinion, causes many problems. That is why I advise the municipality of Eindhoven to include the lack of possible parking spaces in future policy.

Finally, I recommend that the municipality of Eindhoven extends the VBE policy to the entire city. After all, Eindhoven wants to densify in more places (Fellenoord, Strijp-S, Woensel). By creating an unambiguous policy for all these areas, the municipality provides clarity and can possibly lower the affordable housing standard in order to apply it in other locations outside the city centre.

7.2 Limitations and reflection on the research process

7.2.1 Limited data

The existing literature on factors that have influenced decision-making processes on the implementation of HRRB in the Netherlands is limited. Therefore, this research needed to look at broader discussion on densification, infill and high-rise buildings in the literature.

7.2.2 Limited respondents

The number of respondents eligible for this study was small. Finding the right people who really influenced the decision-making process surrounding the implementation of high-rise buildings was difficult. Respondents such as city supervisors in the field of urban planning and councillors are difficult to approach. These people often have little time to participate in these types of studies. For this study, 10 different interviews were conducted with people with expertise in the field, but the majority of the respondents were not directly involved in decision-making. The information that respondents can release from market parties is also limited. they cannot reveal sensitive information that could negatively affect their business. The respondents in this study were still active at the municipality or developer. This may have limited the objectivity of the answers given during interviews.

7.2.3 LIMITED RESOURCES

This research took place between January 2024 and June 2024. The time limit for submitting a master's thesis on time sets a limit on the research. The literature review and data from interviews had to be collected in a limited time. This time limitation resulted in choosing certain respondents who were willing to participate in the research, rather than identifying exactly the people who have the power to influence the decision-making process. In addition, this study was conducted by one person. the manpower for this research was therefore limited. It is also more difficult to determine how objective this research was, since it was only conducted by one person.

7.2.4 REFLECTION ON THE RESEARCH PROCESS

The researcher is satisfied with the results of the research. By identifying 4 themes that have impact on decision-making processes when implementing high-rise residential buildings, the results of this thesis have societal and scientific relevance. On the specific topic of decision-making and policy evaluation on HRRB was not much literature available. This made the process of finding the right literature harder. Therefore this research focused on a broader discussion within the literature on densification, infill and the use of HRRB. When the research switched to this broader focus it was easier to find sufficient literature. Not all literature within the spectrum of this broader discussion could be processed during this research. The researcher had to be selective with the literature, which could cause an observer bias. This means that the researcher's interpretation may not ensure that all information is processed and could have caused a limitation (van Thiel, 2014).

This research derived it's structure by adapting the theorethical framework of Rivolin (2012). This framework was used for the sub-questions and the conceptual model. The data collection process went well. In 1,5 months time, 10 interviews had been conducted. Because of limited time and limited resources, not all respondents that had been selected ultimately participated in the study. Overall the research process went fluent. This master's thesis will be shared with the respondents who requested it. This way, the results of this research will reach the people who may benefit from them. in this way, the results of this research could contribute to problems in practice.

8. LITERATURE

ABN AMRO. (2023). *Sterke prijsstijging bouwgrond hindert nieuwbouw*. https://www.abnamro.nl/nl/media/sterke-prijsstijging-bouwgrond-hindert-nieuwbouw.pdf_tcm16-203409.pdf

Ali, M. M., & Al-Kodmany, K. (2012). Tall Buildings and Urban Habitat of the 21st Century: A Global Perspective. University of Illinois at Urbana-Champaign- Building.

Boelhouwer, P., Hoekstra, J. (2009). Towards a better balance on the Dutch housing market? Analysis and policy propositions. European Journal of Housing Policy.

Bryman, A. (2008), Social Research Methods. Oxford University Press: New York. Third edition.

Bryman, A. (2012), Social Research Methods. Oxford University Press: Oxford. Fourth edition.

Centraal Bureau voor de Statistiek. (2022, 5 juli). Prognose: in 2035 vooral meer inwoners in en om grotere gemeenten. *Centraal Bureau voor de Statistiek*. https://www.cbs.nl/nl-nl/nieuws/2022/27/prognose-in-2035-vooral-meer-inwoners-in-en-om-grotere-gemeenten

Centraal Bureau voor de Statistiek. (2024). *Bevolking in de toekomst*. https://www.cbs.nl/nl-nl/visualisaties/dashboard-bevolking/bevolkingsgroei/toekomst#:~:text=De%20bevolking%20van%20Nederland%20blijft,migratie%20en%20een%20stijgende%20levensduur.

Clerque, F. L., & Hagendoorn, J. (1983). Werken. Planologische.

CPB & PBL (2016). Kansrijk woonbeleid, Den Haag: Centraal Planbureau en Planbureau voor de Leefomgeving.

Designing High-Density cities. (n.d.). Google Books. https://books.google.nl/books?hl=nl&lr=&id=oThZvLKMnCYC&oi=fnd&pg=PA3&dq=high+density+&ots=cSk_rtBPPL&sig=mxaAJ4qaBeWXR0A7HjcneAXRYNQ&redir_esc=y#v=onepage&q=high%20density&f=false

Dieleman, F., & Wegener, M. (2004). Compact City and Urban Sprawl. Built Environment (1978-).

Drew, Nova, & Fanning. (2014). The environmental impact of tall vs. small: a comparative study. Proceedings CTBUH Shanghai Conference.

EHV365. (2021). *De toekomst is van ons samen: Citymarketing Eindhoven 2022 - 2030*. https://www.eindhoven365.nl/assets/documents/Eindhoven365_Strategie.pdf

EHVXL (n.d.). *Kennis- en communityplatform voor stedelijke ontwikkeling in de metropoolregio Eindhoven.* https://ehvxl.nl/

EIB (2016).Investeren in de Nederlandse woningmarkt: Investeringsopgaven in twaalf provincies. Amsterdam: Economisch Instituut voor de Bouw.

Elissen, S. (2008). *Hoogbouwbeleid. Een evaluatie van de Groninger hoogbouwnota* [Masterscriptie]. Rijksuniversiteit Groningen.

European commision. (2016). *No net land take by 2050?* https://www.accesstoland.eu/No-net- land-take-by-2050

Farouk, A. (2011). *High rise buildings and how they affect countries progression*. https://g-casa.com. https://g-casa.com/conferences/zagreb/papers/Akram1-HighRise.pdf

Ferber, & Preuss. (2008). *Circular land use management in cities and urban regions – a policy mix utilizing existing and newly conceived instruments to implement an innovative strategic and policy approach*.https://www.researchgate.net/publication/268332928_Circular_land_use_management_in_cities_and_urban_regions_a_policy_mix_utilizing_existing_and_newly_conceived_instruments_to_implement_an_innovative_strategic_and_policy_approach

Gadet, J. (2018). Ondermijnt hoogbouw de menselijke maat? *Agora*. https://openjournals.ugent.be/agora/article/id/61966/

Gemeente Eindhoven. (2008). *De derde dimensie van een laagbouwstad: Hoogbouwbeleid gemeente Eindhoven*.

Gemeente Eindhoven. (2023). *Herontwikkeling Stadhuisplein en omgeving*. OpenEindhoven. https://www.openeindhoven.nl/binnenstad/herontwikkeling-stadhuisplein-en-omgeving

Gemeente Eindhoven. (2020). *Verdichtingsvisie binnenstad Eindhoven*. https://www.openeindhoven.nl/visies/verdichtingsvisie-binnenstad

Giezen, M., Bertolini, L., & Salet, W. (2014). Adaptive Capacity within a Mega Project: A case study on Planning and Decision-Making in the face of Complexity. *European Planning Studies*, *23*(5). https://doi.org/10.1080/09654313.2014.916254

Gifford, R. (2007). The consequences of living in High-Rise buildings. *Architectural Science Review*. https://doi.org/10.3763/asre.2007.5002

Haaland, C., & Konijnendijk van den Bosch, C. (2015). Challenges and strategies for urban green-space planning in cities undergoing densification. Urban Forestry & Urban greening.

Hooff, V. T. T., Blocken, B. B., Hensen, J. J., & Timmermans, H. H. (2014). On the predicted effectiveness of climate adaptation measures for residential buildings. *Building and Environment*. https://doi.org/10.1016/j.buildenv.2014.08.027

Ibrahim, E. (1998). *High rise buildings - needs & impact*. https://www.irbnet.de/daten/iconda/CIB5047.pdf

Intres, M. (2023, 29 maart). *Onderzoek: binnenstedelijk bouwen positiever dan buitenstedelijk - metropoolregioamsterdam*. Metropoolregioamsterdam. https://www.metropoolregioamsterdam.nl/onderzoek-binnenstedelijk-bouwen-positiever-dan-buitenstedelijk/

Jacobs, J. (1961). The Death and Life of Great American Cities. United States.

Jonker-Verkaart, M. & Wassenberg, F. (2015). Kansen voor particuliere huur in Nederland. Den Haag: Platform31.

Koelemaij, J., Van Weerdenburg, D., & De Olde, C. (2018). Coöperatief verdichten. *Agora*. https://www.researchgate.net/publication/333776788_Cooperatief_verdichten_Interview_met_Leo_Van_Broeck_en_Floris_Alkemade

Koelemaij, J., Wind, B., & van Weerdenburg, D. (2018). Komt hoogmoed voor de bouwval?. *AGORA Magazine*, *34*(3).

Lotfabadi, P. (2014). High-rise buildings and environmental factors. *Renewable & Sustainable Energy Reviews*. https://doi.org/10.1016/j.rser.2014.05.024

Midu, S. (2014). Improving the social sustainability of high rise. CTBUH Journal.

Miller, M. (2002). Garden Cities and Suburbs: At Home and Abroad. Hampstead Garden Suburb Trust.

Ministerie van Binnenlandse Zaken en Koninkrijksrelaties (2016, 15 december). Kamervragen van de leden Van Veldhoven en Koolmees (D66) over het bericht "Grote steden voelen niks voor bouwen in groene zones" [Kamervragen]. Den Haag: Ministerie van Binnenlandse Zaken en Koninkrijksrelaties.

Mottaeva, A., & Zheltenkov, A. V. (2018). High-rise housing as a factor of the increase in investment attractiveness of the city. *E3S web of conferences*, *33*, 01038. https://doi.org/10.1051/e3sconf/20183301038

Mouratidis, K. (2017). Is compact city livable? The impact of compact versus sprawled neighbourhoods on neighbourhood satisfaction. Norwegian University of Life Sciences, Norway.

Nabielek, K., Boschman, S., Harbers, A., Piek, M. & Vlonk, A. (2012). Stedelijke verdichting: een ruimtelijke verkenning van binnenstedelijk wonen en werken. Den Haag: Planbureau voor de Leefomgeving. PBL-2012-Stedelijke-verdichting-500233001.pdf

Needham, B. (2006). Planning, Law and Economics. In *Routledge eBooks*. https://doi.org/10.4324/9780203639658

Nguyen, L. P., van den Berg, P. E., Kemperman, A. D., & Mohammadi, M. (2024). Social impacts of living in high-rise apartment buildings: The effects of buildings and neighborhoods. *Journal of Urban Affairs*, 1–22. https://doi.org/10.1080/07352166.2024.2311165

Olthuis, M. (2018). Hoogbouwbeleid in Tilburg: Van Blauwdruk naar maatwerk. *https://openjournals.ugent.be/agora/article/id/61965/*

Populationpyramid, (2023). https://www.populationpyramid.net/nl/bevolkingsdichtheid/2023/

Rijksoverheid. (z.d.). Aan de slag met de Omgevingswet. https://aandeslagmetdeomgevingswet.nl/

Rieuwerts. (2023). MILJOEN WONINGEN BOUWEN IN NEDERLAND: WAAR KAN DAT? *https://www.service-studievereniging.nl/*. https://www.service-studievereniging.nl/magazine/artikel/miljoen-woningen-bouwen-in-nederland-waar-kan-dat/

Rivolin, U. J. (2012). Planning Systems as Institutional Technologies: a Proposed Conceptualization and the Implications for Comparison. *Planning Practice + Research/Planning Practice And Research*. https://doi.org/10.1080/02697459.2012.661181

Schilder, F. & Conijn, J. (2015). Middeninkomens en het middensegment. De ontbrekende schakel op de woningmarkt, ASRE Research paper 2015-10, Amsterdam: Amsterdam School of Real Estate.

Simons, T. (2014). *Hoogbouwontwikkeling* [Bachelorscriptie]. Erasmus school of economics. Erasmus University Thesis Repository: Hoogbouwontwikkeling (eur.nl)

Sirowy, B. (2016). Public spaces in a compact city: planning for social capital. Budapest 2016.

Stichting Hoogbouw. (z.d.). Een studie naar de nederlandse hoogbouwcultuur. *Stichting Hoogbouw*. https://www.stichtinghoogbouw.nl/download/hoogbouwbeleid.pdf

Teller, J. (2021). Regulating urban densification: what factors should be used? Buildings and Cities, 2(1), pp. 302–317. DOI: https://doi. Org/10.5334/bc.123

Ter Weeme, L. (2017). *Wat wil de ondernemer? Een onderzoek naar het besluitvormingsproces naar ondernemers die investeren in vastgoed* [Masterscriptie]. Radboud Universiteit Nijmegen.

Theeuwen, M. & Brabants Dagblad. (2020). Kan wethouder Torunoglu kritiek op hoogbouwvisie in Eindhoven doen verstommen? *https://www.bd.nl/eindhoven/kan-wethouder-torunoglu-kritiek-op-hoogbouwvisie-in-eindhoven-doen-verstommen~a5f841eb/*.

Timmermans, W., Goosen, H., Van Eijsden, G., Gersonius, B., Roosenschoon, O., Broks, K., Dill, S., & Maas, G. (2020). Case study : DNA van de stad als levende basis voor aanpak klimaatadaptatie : Groen wat kan, grijs wat moet. *Water governance*, *3*. https://research.wur.nl/en/publications/case-study-dna-van-de-stad-als-levende-basis-voor-aanpak-klimaata

Towers, G. (z.d.). The Implications of Housing Density. *https://citeseerx.ist.psu.edu/*. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=017ddb4263bd8d9ad3972651875dd45fd47af130

Van Thiel, S. (2014). *Research Methods in Public Administration and Public Management: An Introduction*. http://ci.nii.ac.jp/ncid/BB15220045

Van Kempen, E. (1986). High-rise housing estates and the concentration of poverty. Neth. J. of Housing and environment. https://doi.org/10.1007/BF02496451

Verschuren, P & Doorewaard, J. (2010). Designing a research project (2e editie). Eleven international publishing.

Vlak, A., Middelkoop, M. van, Schilder, F. & Eskinasi, M. (2017). Perspectieven voor het middensegment van de huurwoningmarkt. Verkenning van maatregelen ter bevordering van het aanbod, Den Haag: PBL.

Wassenberg, F., & Bugera, S. (2024, 17 april). *Oud versus nieuw: hoogbouw in Nederland in kaart gebracht - Platform31 | Kennis en netwerk voor stad en regio*. Platform31 | Kennis en Netwerk Voor Stad en Regio. https://www.platform31.nl/artikelen/oud-versus-nieuw-hoogbouw-in-nederland-in-kaart-gebracht/

Wassenberg, F. (2006). The integrated renewal of Amsterdam's Bijlmermeer high-rise. Informationen zur Raumentwicklung.

Zandbelt, D. (2011). *Citius Altius Fortius: Mythes over hoogbouw*. https://books.google.nl/books?hl=nl&lr=&id=OnSSLtkxbc8C&oi=fnd&pg=PA140&dq=grondprijs+en+hoogbouw&ots=xJiXtvpbBf&sig=k-rOPeqZM0vfdxMyQ6Ie64vLxvA&redir_esc=y#v=onepage&q=grondprijs&f=false

Zeiler, W. (2017). Sustainable High-Rise Buildings in the Netherlands. Sustainable High Rise Buildings in Urban Zones.