LIMITATIONS TO THE ROW HOUSE PARADIGM

A design study into an Adaptive and Alternative densification strategy for Almere

COLOPHON

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A design study into an Adaptive and Alternative densification strategy for Almere

MSc Urbanism
Department of Urbanism
Faculty of Architecture and the Built Environment
Technische Universiteit Delft

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Gemeente Almere

Preface

A booklet and report on a design study into an adaptive and alternative densification strategy for the city of Almere are in front of you. This is done with the intention of conducting a critical view on the current living culture in the Netherlands, which is currently driven by the Row House Paradigm. The graduation assignment was done on the basis of the Master of Science in Urbanism by the Delft University of Technology. The thesis was part of the graduation studio 'Design of the Urban Fabric.

First of all, I would want to thank all my tutors and mentors. I want to thank Dr. Victor Muoz Sanz, my first mentor, for all of his advice and guidance. I also like to thank Zef Hemel, who was my second mentor, for the discussions we had. The quality of this thesis was enhanced thanks to their guidance. I would also like to thank Dr. Claudiu Forgaci and Dipl. Ing. Birgit Hausleitner, tutors of the graduation studio.
In addition, I'd like to thank Paola Huijding from the municipality of Almere for her advice, assistance, and helpful attitude.

I hope you enjoy reading this report!

Kind regards,
Erik van Diermen

Table of Content

1.

INTRODUCTION

Background and focus

Urban development is applied in different stages. The first cities in the Netherlands date back to the early Middle Ages, between 1200 and 1300 AD (Rutte, 2016). However, new cities are still being constructed in different parts of the world today (Zapata, 2020). This demonstrates the process of creating new cities is still ongoing and developing.

Expansion of the city applies to the fact that the existing build environment of cities has become too small to house new settlers. Therefore, expansion is necessary to house these people (van den Boomen et al., 2022). This is most evident in the Netherlands in the post-war era (after 1950), when a large population boom and the destruction of more than 100.000 homes during the war led to a significant housing shortage (Lörzing, 2021; Faludi & van der Valk, 1994).

Another phase of urban development is transformation and densification. In the Netherlands, this stage is primarily the result of the national government's decision to maintain space in the country for other uses like nature and agriculture by restricting construction to the boundaries of the current city rather than allowing it to grow (van den Boomen et al. 2022). *Transformation* has lately become a important concept in the Netherlands. This part necessitates the transformation of industrial areas, many of which date back to the era of the Industrial Revolution and have been enclosed by urban expansion throughout the years. Also undeveloped and empty spaces in cities, known as Drosscapes (Berger, 2007) or porosity, is where transformation is focused. To add housing in existing cities and to not build outside city limits, these areas where the first to be picked up. Examples of this include Merwedekanaalzone (Broekman et al, 2020), Kauwgomballenkwartier (Gemeente Amsterdam, 2020), Merwe-vierhavens (Rotterdam Makers District, 2019) and De Nieuwe Stad (Gemeente Amersfoort, 2022).

Redevelopment of existing neighbourhoods is another, yet unfamiliar, stage in urban development. Von Meding et al. (2020) call this "wijkvernieuwing" (urban renewal) and describe several timeframes of urban renewal in the Netherlands. Urban renewal (1.0) in the 1980s focused more on improving the isolation and size of individual homes. This changed in the 1990s to include owner-occupied homes as a tool to upgrade neighbourhoods. Affordable housing, contextual development and strong neighbourhoods became important (Urban Renewal 2.0). It seems like urban renewal 3.0 is the next step. According to the Board of Government Advisors in the Netherlands (College van Rijksadviseurs), a lot of opportunities to densify, to add dwellings and to mix functions and people, are achievable in suburban neighbourhoods with currently a low density (van den Boomen et al., 2022). In addition, while a population is still living in these neighbourhoods and enjoying their way of life, densifying these neighbourhoods presents a variety of challenges. This is the main area of discussion in this thesis.

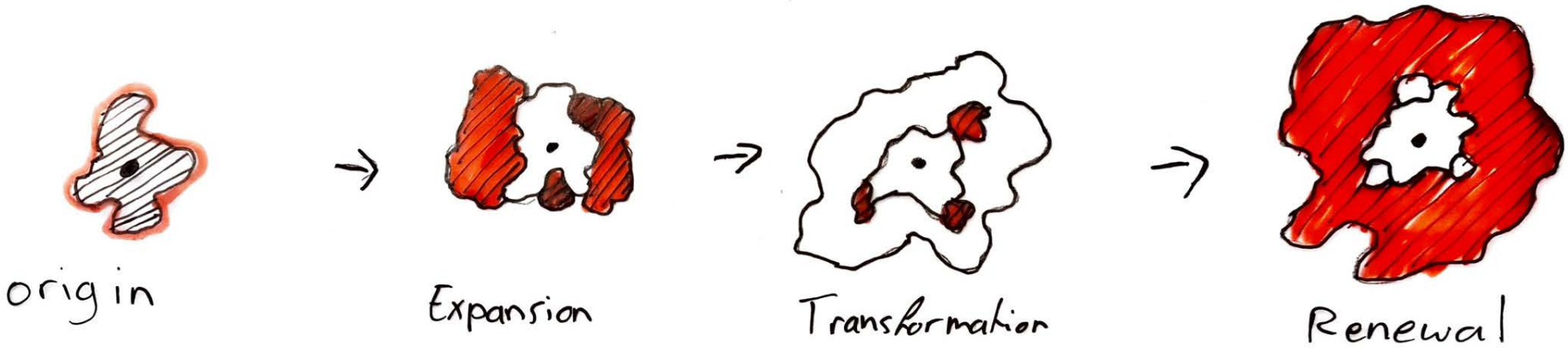


Figure 2.1: Phases in urban development (image by author, inspired by Price (1982))

2.

THE BRIEF

Demographics in the Netherlands

In the last decades, the demography and society in the Netherlands developed and changed. The average Dutch household size has decreased from over four people in 1950 to slightly over two people in 2020 (Centraal Bureau voor de Statistiek, 2021). Additionally, the number of one-person households, or individuals who live alone for a variety of reasons, has increased from 245,000 in 1950 to a staggering three million in 2020 (Centraal Bureau voor de Statistiek, 2021). The prognosis suggest a further grow to around four million in 2050 (CBS statline, 2021). This is partly caused by an increase in the population of elderly people. Since the average age of the Dutch population is rising, the number of elderly people will increase. Due to a lack of suitable housing in elderly homes, elderly frequently remain in their single-family homes (von Meding, 2020).

Immigration and the welcoming of refugees also changes the demography in the Netherlands, bringing different values and wishes to the urban environment, mainly suitable and affordable housing. According to the prognosis by CBS Statline, the amount will eventually settle to around 300.000 in 2050 (2021).

As a result of all these changes, the urban environment in the Netherlands is becoming increasingly unsuitable for the population. According to van den Boomen et al. (2022), these developments increase the demand for space while space is limited in the Netherlands.

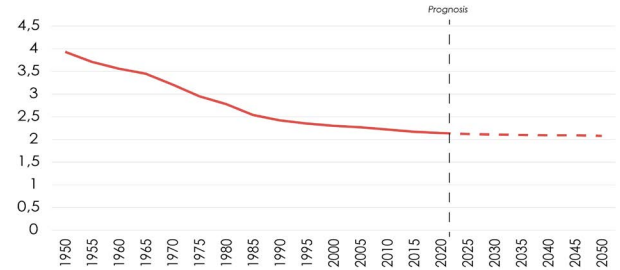


Figure 2.1: Household size in the Netherlands (Centraal Bureau voor de Statistiek, 2021; CBS Statline, 2021)

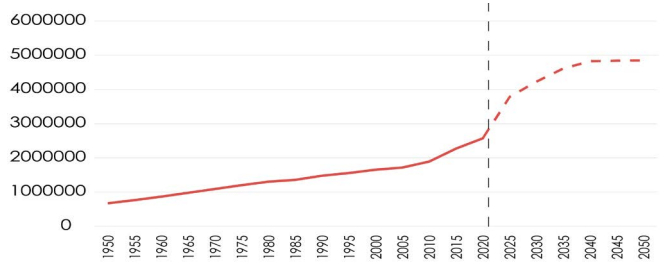


Figure 2.2: 65-80 year old in the Netherlands (Centraal Bureau voor de Statistiek, 2021; CBS Statline, 2021)

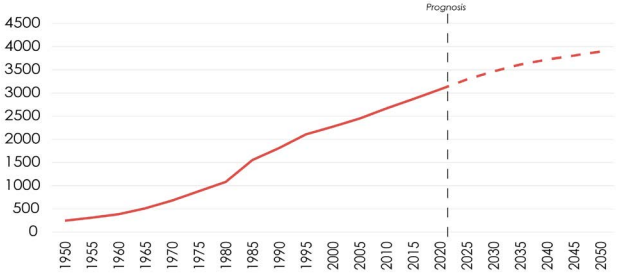


Figure 2.3: One-person households in the Netherlands (Centraal Bureau voor de Statistiek, 2021; CBS Statline, 2021)

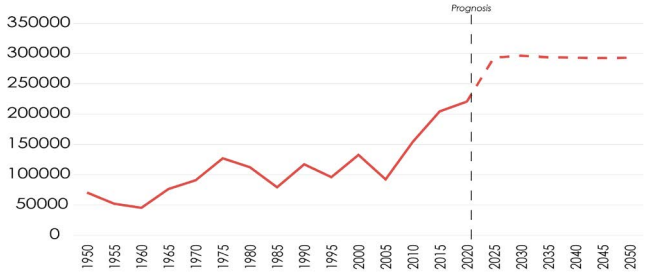


Figure 2.4: Immigration growth in the Netherlands (Centraal Bureau voor de Statistiek, 2021; CBS Statline, 2021)

Urban Environment in the Netherlands

The majority of the urban environment in the Netherlands is constructed after the second world war. The post-war housing crisis kickstarted spatial and urban planning on a national level. Five different policy documents spread over 40 years (ruimtelijke nota's) outlined the strategy concerning the spatial structure of the Netherlands. The second policy document (Tweede Nota Ruimtelijke Ordening) has gone down in history as "*the most influential and iconic report on spatial planning in Dutch history*" (Lörzing, 2021, p. 85). What makes the policy document special is the corresponding map 'de blokjeskaart' (*figure 2.5*). The map was a design of how the Netherlands will look like in the year 2000 (Faludi & van der Valk, 1994). High population forecasts, swift urban growth and a profound increase in car use were the assumptions made that formed the basis of the strategies. Various blocks of different colours and sizes represented the type of urban environment and density and amount of population. Another corner stone of the Dutch urbanisation planning and strategy was the introduction of growth cores (Faludi & van der Valk, 1994). Simular to the growth cores was the introduction of new towns (Lörzing, 2021; Osborne & Whittick, 1969). This enabled controlled overspill from the Randstad to surrounding cities, called "*concentrated deconcentration*" (Faludi & van der Valk, 1994, p. 165). Almost everything the Blokjeskaart showed in 1966 was realised in the following decades and therefore, one of the highlights of Dutch urban planning. To this day, two thirds of the current urban environment of the Netherlands is built in the post-war era (from 1950 to 1990), based on this map.

The growth of the Row House (Paradigm)

The primary housing type in this era was the row house, mainly caused by the concentrated deconcentration strategy (Faludi & van der Valk, 1994; Reijndorp et al, 2012) (*figure 2.7*). Crisis and war were over and prosperity increased (Lörzing, 2021; Faludi & van der Valk, 1994). This sparked the rise of the 'welfare state' era (Lörzing, 2021). A time when equality and social security were highly valued due to significant political influence caused by the rise of left wing, labour parties. The welfare state reached its peak in the seventies. The famous words of the than labour-socialist Dutch prime minister Joop den Uyl; '*A car for every family*', especially the working-class, highlighted this the most (van der Vinne, 2011). The same mindset was used for housing the population. Every family should be able to live in the type of housing which was most suitable to their standards. The row house became the figurehead of affordable luxury. As Faludi & van der Valk describe: "*national planners recognized that families with children (at that time the almost exclusive concern of housing and planning policy) preferred homes with gardens*" (1994, p. 133). This meant approximately three quarters of the current row houses in the Netherlands were built after the second world war (Hulsman & Kramer, 2013; Centraal Bureau voor de Statistiek, 2023) (*figure 2.6*). The combination of modernist architecture and prefabrication made standardisation possible in order to build large amount of dwellings in a relative short time (*figure 2.8*). At that time, an important necessity due to the national housing shortage.

Figure 2.5: 'Blokjeskaart' of the second note spatial planning of 1966 showing the northern part of the Netherlands (Ruimschotel, 2019)

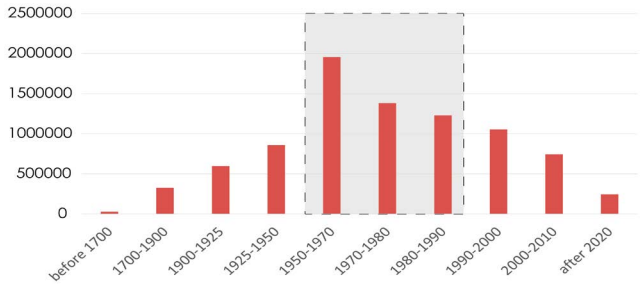


Figure 2.6: Time period construction of buildings in the Netherlands (Centraal Bureau voor de Statistiek, 2023)

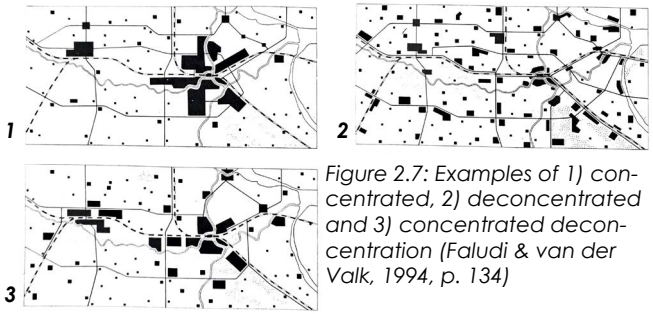


Figure 2.7: Examples of 1) concentrated, 2) deconcentrated and 3) concentrated deconcentration (Faludi & van der Valk, 1994, p. 134)

Figure 2.8: 1960s Neighbourhood 'Jeruzalem' in Tilburg (Regionaal Archief Tilburg, 2019)

The Row House Paradigm expressed in Almere

Almere was set up as a suburban city from the day it was conceived (Reijndorp et al., 2012). Hulsman & Kramer refer to Almere as "*the capital of Row House land*"(2013, p. 18). They also refer to a quote by Petra Brouwer: "*Almere is anti-utopia. The urban planners did not intend to change the status quo here, rather the opposite. The radicality of the Almere experiment stems from a meticulous extrapolation of reality*" (Hulsman & Kramer, 2013, p. 18). Therefore, 63% of the housing stock of Almere consist of row houses (CBS Statline, 2022). For the majority, they make up the tissue between the urban centers and the outskirts of the city. The detached and semi-detached dwellings can be found at the outskirts. In the centers most of the apartments are located. However, this is takes up the vast majority of the area the city. The spatial implications of this can be seen in the figure. Due to their sheer size row houses make up a significant portion of the city's overall footprint (figure 2.9). The size of the number of row houses in Almere is significant when compared to the largest cities in the Netherlands (all figures are to scale). Of the four cities, Utrecht has the most row houses (39%). (CBS Statline, 2022). This is by no means even close to the size of Almere.

Figure 2.9: Row houses in Almere highlighted
(Basisregistratie Adressen en Gebouwen, 2021)

Figure 2.10: Amsterdam
(Basisregistratie Adressen en Gebouwen, 2021)

Figure 2.11: Den Haag
(Basisregistratie Adressen en Gebouwen, 2021)

Figure 2.12: Rotterdam
(Basisregistratie Adressen en Gebouwen, 2021)

Figure 2.13: Utrecht
(Basisregistratie Adressen en Gebouwen, 2021)

Urgencies

The overarching driver of change in this thesis is notably climate change. This driver of change is the main force in the field of Urbanism of designing more sustainable urban environments. To design solution to decrease car-use, add greenery and to use space in a more efficient manner.

This last element is also connected to the shortage of space in the Netherlands, which is also a driver of change in this thesis. As the conceptual framework suggest the Compact City concept offers a lot of benefits for this. The Compact City concept enables, overall, a more efficient use of space by having amenities and dwellings in close proximity to one another (Blowers, 1993; Breheny, 1992; Elkin et al., 1991). These benefits were later identified in the New Urbanism and Smart Growth concepts (Bohl, 2000; Knaap & Talen, 2005) and will be explained in the next chapter. In the upcoming years, the population of Almere will double (Gemeente Almere, 2021). The surface area required to accommodate the growing population will also double if the ongoing trend of the Row House Paradigm is not changed. Currently, the density of housing in Almere is 33 dwellings per hectare. To accommodate the intended number of dwellings at the current density, 6500 hectares of additional surface area are required (figure 2.14). Conflicts will arise with neighbouring stakeholders, such as farmers, environmental organisations, and to some extent the national government. It's crucial to think about whether this scenario is actually preferable. The negative effects of urban sprawl, which the field of Urbanism seeks to address in the first place, will be increased in this way.

Secondly, the changing demographics are considered a driver of change in this thesis. The current housing stock of Almere is not in balance with the type of households it seeks to accommodate. This imbalance will only increase if the demographics continues to develop and the housing stock will continue to follow the ongoing trend of the Row House Paradigm. Resulting in unattractive, expensive, and excessively large housing for particular sorts of households. Resulting in a heated housing market, according to Dutch terms (Lörzing, 2021). However, the urgency on this driver of change is not that high. The statistics show that one-third of the households live in dwellings that are considered to be too big (CBS Statline, 2021, 2022). We don't hear about this because it is regarded as a luxury and currently, a substantial amount of people can still afford a house too large for them.

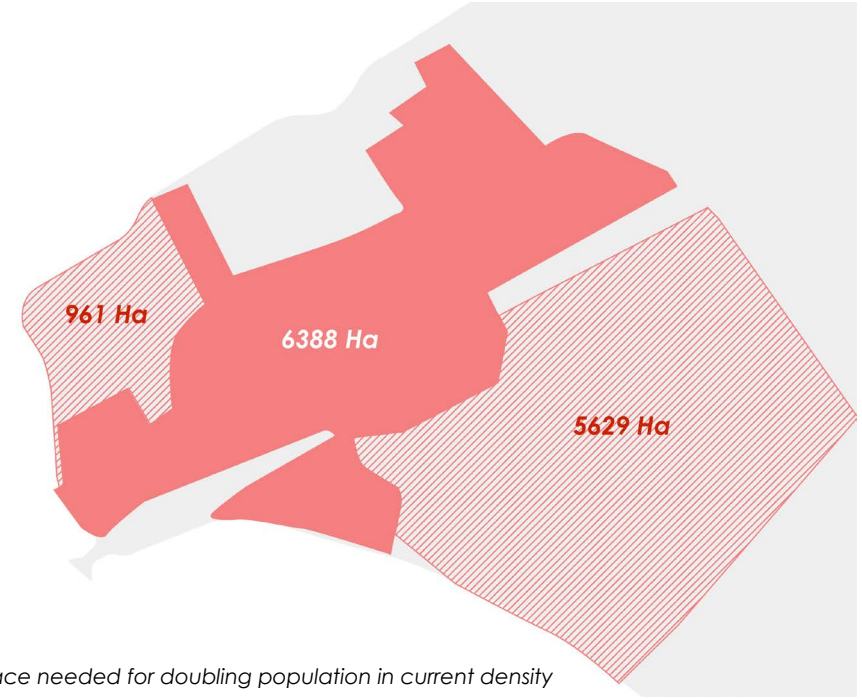


Figure 2.14: Space needed for doubling population in current density

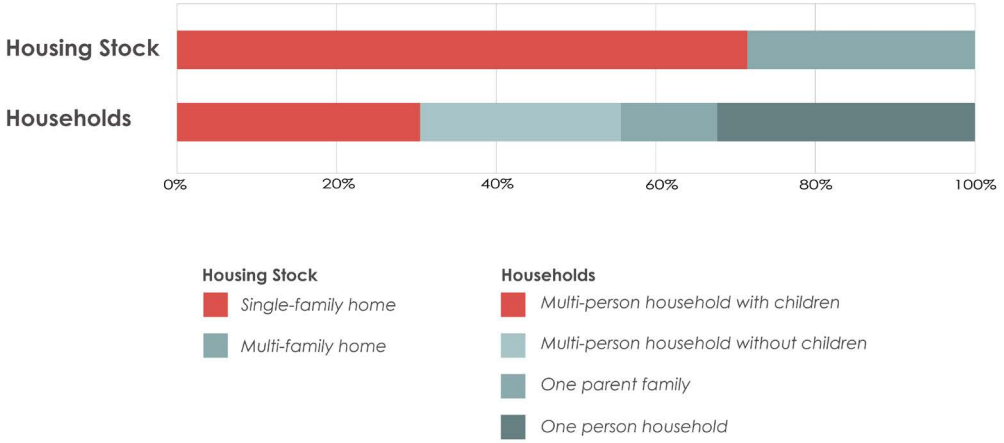


Figure 2.15: Current Housing Stock and Household types in Almere (CBS Statline, 2021, 2022)

Problem Statement

With the current demographic changes and shortage of space developing on the national scale, in combination with climate change, the urban environment of the Netherlands needs to be adapted in order to cope with these developments. As stated in the previous subchapter, Almere is the ideal subject for this thesis. The urban environment of the Netherlands consist for the most part of post-war suburban neighbourhoods with low density focused on a specific socioeconomic population. These were the results of projections during the time these neighbourhoods were designed (Oosterhoff et al., 2012; von Meding et al., 2020; von Meding et al., 2021; Faludi & van der Valk, 1994). The extensive use of this type of neighbourhood in Almere will be further investigated in this thesis. The opportunity of coping with the drivers of change lies in these neighbourhoods, both socially, economically and spatially (Raad voor Volksgezondheid & College van Rijksadviseurs, 2022; van den Boomen et al., 2022; von Meding et al., 2020). Therefore, the problem statement is as following:
The continued use of the Row House Paradigm in Almere lacks the capability and requirements for achieving sustainable and future-proof transitions for current and future challenges facing the urban environment.

Methodological Framework

The drivers of change are the foundation and bedrock of the research and form the motivation and base for the problem statement and -analysis. The overall research can be divided in three pillars. The outcomes of the three pillars form the basis of which the design will be developed. First, the urgencies will be pointed out in the analysis of the Row House Paradigm. An investigation and orientation in different tools to use to implement and face the challenges will then be gathered, resulting in the potentials. The opportunities, in this thesis are aimed at the case of Almere. These pillars come together at the entablature and serve as the framework on which the pediment of the design strategy will be supported, expressed in a Adaptive Alternative Almere. This provides a better overview and acts as a guide throughout the entire research process.

Research aim

The aim of the research consists of two parts. The first part, and the most important part, is focused on the city of Almere. The research will seek to identify how Almere can develop in the future using an adaptive and/or alternative strategy. The main goal of this will be to generate a suitable urban environment for both the present and future population of Almere, tackling the challenges faced today and aim for a more future-proof city. This strategy will seek to accommodate new lifestyles in combination with current lifestyles by the population, while emphasizing existing values of the current urban environment and build on and even enhance existing values of the city structure of Almere.
The second part, which is more in the background and serves as a by-product, is concentrated on a larger and more national scale. The aim is to evidence how densifying and diversifying the urban environment can help to accommodate the challenges the Netherlands faces today. This will be especially be investigated for post-war suburban neighbourhoods with a relative low density. On this scale, the research will question our current living standards and lifestyles. It will seek to highlight the limitations towards the future of how we currently live, offer suggestions for improving the aspects of our current way of life that are future-proof, and distinguish and understand the ones that aren't.

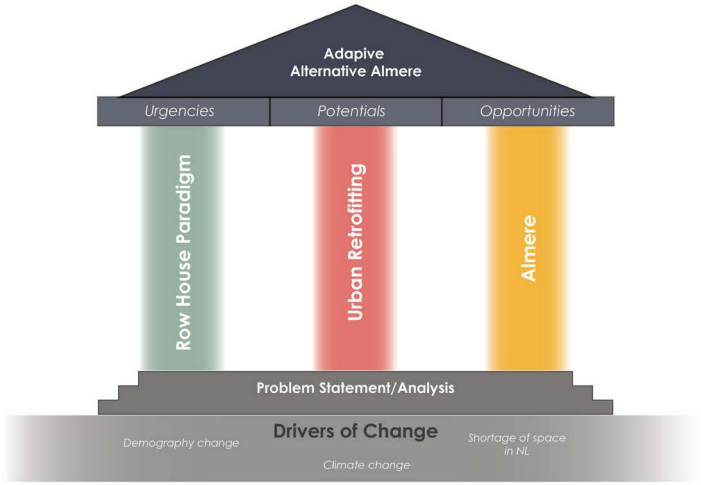


Figure 2.16: The research as a temple

Research Questions

To solve the problem statement and accomplish the research aim, the thesis identifies a main research question. The main research question is:
How can the techniques and guidelines for densification and diversification be applied in an adaptive and alternative vision for Almere in order to identify the limitations and counter the urgencies the Row House Paradigm creates?
Sub questions help to answer the research question. The sub questions are divided to relate to different parts of the research.

Conceptual background
The main goal of this question is to determine what the Row House Paradigm means and represents. Also, to recognise the existence of the paradigm in the first place, answering the why-question. It is crucial to provide evidence for the responsibility of the paradigm in the problem analysis. This will ultimately lead to a better understanding of the problem analysis. The problem analysis identifies drivers of change as its input. The drivers of change of this thesis are the changing demographics, stagnated housing market, climate change and shortage of space in the Netherlands. The methods used for the answering of this question will for the most part contain desk research. Statistics, literature reviews (newspaper articles, scientific papers) and policy documents will be the main source of information. The first sub question applies to the conceptual background and reads:

- ***What is the Row House Paradigm in the Dutch context?***

Analysis
As part of the first examination and analysis of Almere, the following question provides a spatial perspective of Almere for its valued characteristics of the urban environment. Historical and spatial analysis, in combination with the drivers of change, will eventually lead to a SWOT-Analysis. The question reads:

- ***What are, currently and at the time of its founding, the main design principles and qualities of Almere?***

The goal of the following question is to identify various densification and diversification strategies, in this thesis combined as Urban Retrofitting, that can be applied later in the research to the design strategy and implementation.

This part is mainly focused on the cause of gathering the tools and information about the ability of diversification and densification in suburban neighbourhoods.

- ***What techniques and guidelines could be gathered to achieve densification and diversification in the urban environment?***

Design Strategy
The third part of the research pays attention to the design strategy. As the name suggest, this part is where strategies are identified which can be used in the implementation part of the thesis. The following question corresponds to the section of the conceptual background and offers an assessment of how the urgencies, created by the Row House Paradigm, affect Almere in the current situation.

- ***How are the urgencies of the Row House Paradigm expressed in Almere?***

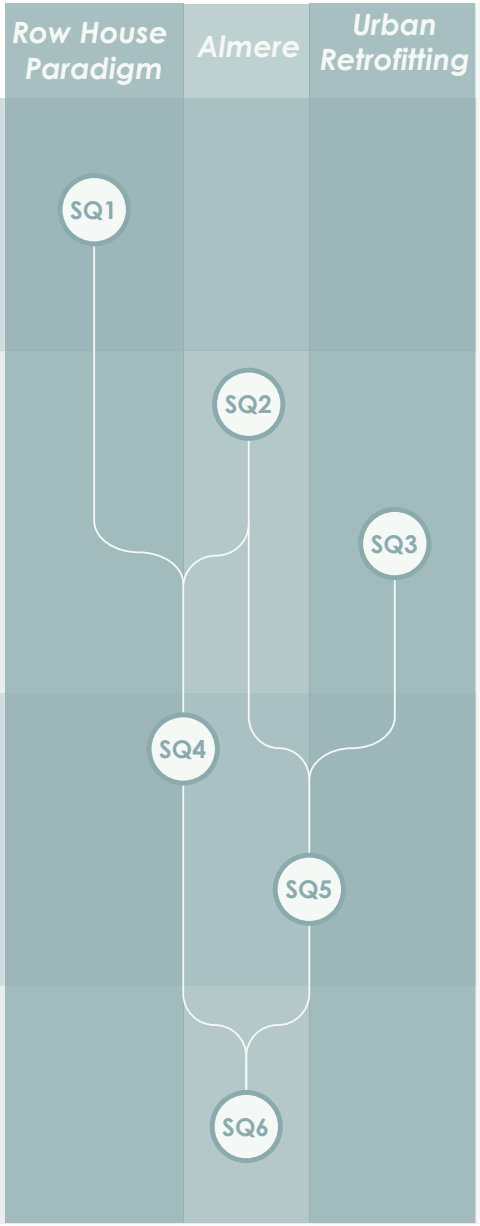
The second question of this part aims to use the techniques and guidelines, gathered in the second research question of the thesis, in combination with outcomes of the third research question. It looks into possible solutions for the city's threats and weaknesses. Additionally, and perhaps more importantly, it seeks to determine how Almere's strengths and opportunities, done in the SWOT-analysis, might enhance the interventions and tools suggested for the design. Design exploration and research through design are important methods for this part of the research.

- ***How can the main design principles of Almere amplify the implementation of the techniques and guidelines for densification and diversification?***

Implementation
The final part of the research provides a strategy towards the implementation in Almere. A different important factor in this sub question is the sequence of events to follow and how it applies to existing plans for the city to densify and add housing to the urban environment. The main outcome of this part will be the main potentials and urgencies of Almere on a city level.

- ***What alteration of the city structure is able to improve, optimise, and establish the modifications necessary to adapt the urban environment?***

MRQ How can the ***techniques and guidelines for densification and diversification*** be applied in an ***adaptive or alternative vision for Almere*** in order to identify the ***limitations*** and counter the ***urgencies*** the ***Row House Paradigm*** creates?



	Sub Questions	Methods	Outcomes/Results
Conceptual Background	What is the ***Row House Paradigm*** in the Dutch context?	Research for Design *o Literature review (news paper articles; policy documents)* *o Data research (Statistics)*	***Problem Analysis:*** *o Changing (future) demographics* *o Unsuitable Housing Stock* ***o Row House Paradigm:*** *o Evidence that a paradigm exists* *o Pointing out the limitations of the paradigm*
Analysis	What are, currently and at the time of its founding, the ***main design principles and qualities of Almere***?	Research through Design *o Historical Analysis* *o Spatial Analysis* *o Policy Analysis* *o SWOT-Analysis*	*o Values of urban environment of Almere* *o Lifestyles in Almere* *o Maps Strengths and Opportunities* *o Mapped Spatial Potentials & Urgencies*
	What ***techniques and guidelines*** could be gathered to achieve ***densification and diversification*** in the urban environment?	*o Literature Review* *o Spatial Analysis* *o Policy documents* *o Exploration from projects*	*o Tools for Urban Retrofitting* *o Opportunities for densification in existing Urban Environment* *o Opportunities for diversifying socially, spatially and economically* *o First steps towards the Design Strategy*
Design Strategy	How are the ***urgencies*** of the ***Row House Paradigm*** expressed in ***Almere***?	Research through Design *o Design study* *o Design Exploration* *o SWOT-Analysis*	*o Mapped Spatial Urgencies* *o Spatial Urgencies into actions* *o Maps Weaknesses and Threats*
	How can ***the main design principles of Almere*** amplify the implementation of the ***techniques and guidelines*** for ***densification and diversification***?	*o Design Study* *o Policy documents* *o Interviews (municipality)*	*o Design Strategy on different scales (city, district, neighbourhood)* *o Testing possibilities of the techniques and guidelines*
Implementation	What ***alteration*** of the ***city structure*** is able to ***improve, optimise, and establish*** the modifications necessary to adapt the urban environment?	Research by Design *o Literature Review (Policy documents)* *o Data of Municipality* *o Interviews (public & Community)*	*o Alternative Strategy towards 5th city of NL (towards 2050)* *o ... And beyond 5th city of NL (towards 2100)* *o Design for new the supporting new city structure*

Conceptual framework

In order to better understand the guiding principles of the conducted research, the conceptual framework provides insight into how various topics and focus areas are related to one another.
Three layers make up the framework. The connection between this framework and the *social, spatial, and economic domain* is the background, or layer one. These domains are divided into *spatial design* and *engagement strategy,* two parts the urban designer has an impact on (Talen, 2008: Hemel, 2021). The urban environment, which the urbanist designs and plans, is modified using a newly designed spatial strategy. For this modification, the engagement strategy is the strategy which analyses and organises the engagement with the users and owners of the space, which has an important impact on the design strategy as a whole.
The second layer follows this division between spatial- and engagement strategy and gives these strategies more meaning. *Accommodating lifestyles* is merely a result of the engagement strategy and gives an inside of how lifestyles could be accommodated and accomplished on the various domains (social, spatial and economic). *Emphasizing values* is closely entangled with the physical domain, and as a result, impacts and is impacted by the *spatial design.*
The third and last layer displays the purpose and aim of this research. The thesis, which offers an alternative design strategy as indicated by the subtitle of this report, seeks to create an ***Adaptive Alternative Almere***. This ideal is surrounded by four fundamental principles. The distinctions between *Engagement Strategy* and *Spatial Design* also apply. These ideas are interconnected and are also a component of the concepts of *Diversity* and *Densification* (Talen, 2008). The conceptual framework shows that there is an interaction between spatial and engagement results. The framework shows the important position of creating a mix on the social domain (*Social Mix*) and a mix on the economic domain (*Mix-Use*) (Fainstein, 2005; Talen, 2008). These fall both in the components of *Diversity* and *Densification* (Talen, 2008). The spatial design will further focus on the *Compact City* on the spatial domain. From point of view of the engagement strategy, *Variety of Urban Form* has the capacity of increasing diversity in the urban environment. This is expressed in the diversity of dwelling types or size, use of public space, size or quantity of amenities and so on (Fainstein, 2005; Talen, 2008).

Figure 2.17: Layer 1

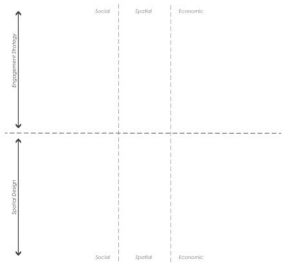


Figure 2.18: Layer 2

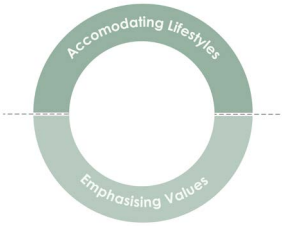
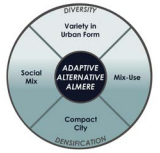


Figure 2.19: Layer 3



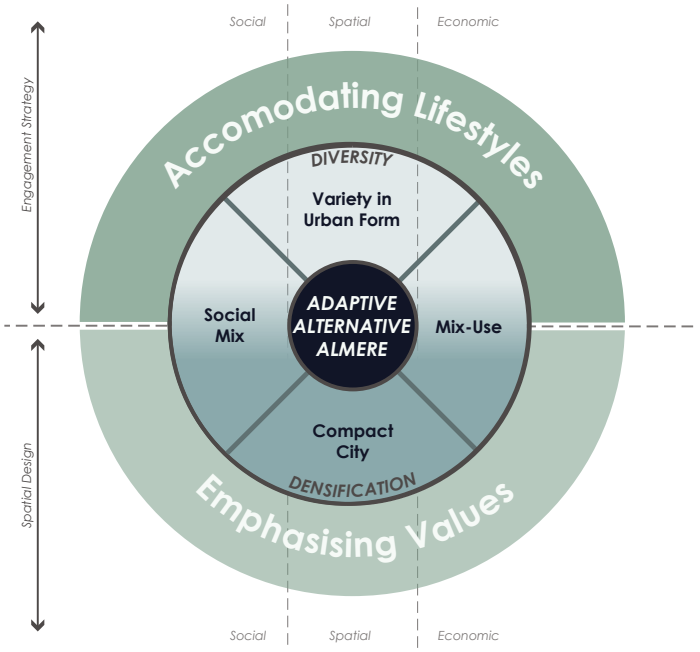


Figure 2.20: Conceptual Framework; Limitations to the Row House Paradigm

3.

THE ROW HOUSE PARADIGM

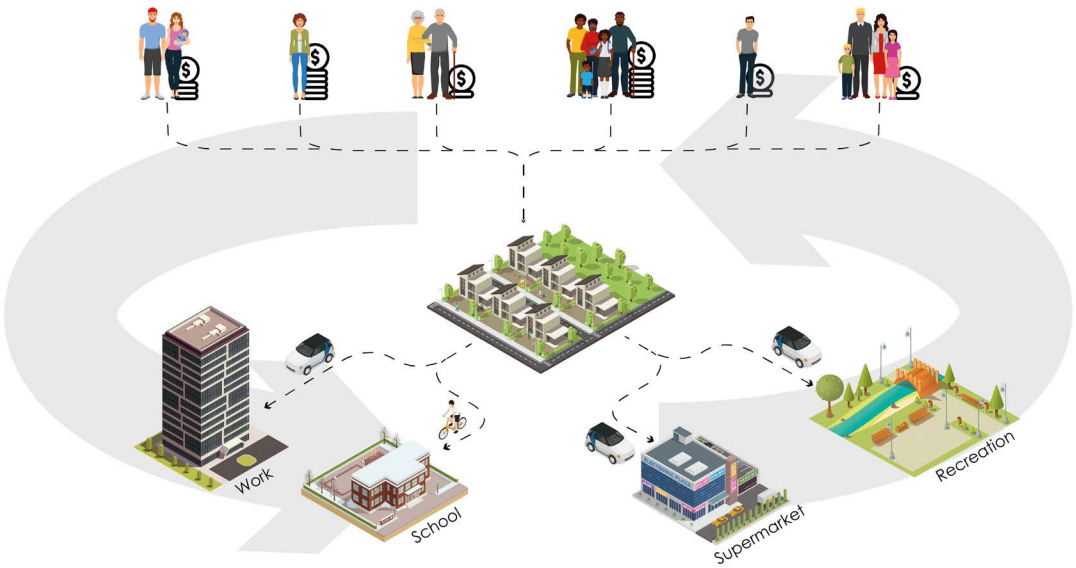


Figure 3.1: Schematic view of the Row House Paradigm (By author)

Introduction

In this chapter, the Row House Paradigm will be explained. The Row House Paradigm can be defined as the tradition (and desire) of building ground-based single-family homes, in particular row houses, in the urban environment of the Netherlands. This enforces a upon the society a specific lifestyle, regardless of social and economic background and social, spatial and economic needs. A lifestyle that fits and is caused by the urban environment. The Row House Paradigm increases the use of cars and distances between life, work and recreation. Urban sprawl and suburbanisation are terms that are frequently used in the field of Urbanism that seem similar to the Row House Paradigm. However, the Row House Paradigm touches much more. Suburbanisation focuses on the spatial and economic domain, the migration of the population from densely populated regions (of a city) to thinly populated regions (Grant, 2008; Hayden, 2008). The term 'urban sprawl' refers to the development of settlements consisting of small to medium-sized urban areas clustered around a city, which convert rural settlements into low density urban landscapes (Duany et al., 2000; Grant, 2008). *"It is the city trying to escape the consequences of being a city while still remaining a city. It is urban society trying to eat its cake and keeping it, too"* (Douglass, 1925). This places more emphasis on the spatial and social domains. The Row House Paradigm has factors of both concepts however, it contains much more in the form of lifestyle and values, putting more emphasis on both spatial, social, economic and even cultural domains. The precise reasons why the Row House Paradigm is regarded a paradigm will be covered in the following subchapter. This will provide a scientific foundation. It includes an overview which shows that the several domains have an impact and are the underlaying causes of the creation of the paradigm will be discussed and explained.

The rise of the paradigm

The definition of '*paradigm*' in the Cambridge Dictionary (2023) is: "*A model of something, or a highly clear and typical example of anything*". In my own words: "*an example which is used over and over again, without questioning it*". The use of the Row House Paradigm in the urban environment has become a normality because it was used in the past and it functions reasonably will in the present. Thomas Kuhn conducted extensive scientific research on scientific paradigms and how scientific revolutions, paradigm-shifts, can be set in motion. To better understand the idea of a paradigm, it is interesting to use Kuhn's work to better understand the Row House Paradigm. Kuhn's idea of the meaning of a paradigm is; "*... the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community*" (2012, p. 175) and a "*scientific tradition*" (2012, p. 112).

A paradigm according to Kuhn

According to Kuhn (2012), a paradigm consists of certain models and concepts that the scientific community takes for granted. This can be stated for the use of the row house, and in a wider context single-family homes, as the primary dwelling type in the Netherlands. Approximately two thirds (64%) of the housing stock in the Netherlands are single-family homes (Centraal bureau voor de Statistiek, 2021). Almost 80% of the amount of single-family homes in the Netherlands are row houses, which is more than 50% of the entire housing stock. In recent years, the trend of adding single-family homes has still been increasing while the trend of multi-family homes varies through time (Centraal bureau voor de Statistiek, 2021). This proves and enhances that the Row House Paradigm is continues in the Netherlands to this day. Row houses, also classified as single-family homes, is the most used dwelling type in the Netherlands.

According to Statistics Explained (n.d.), only 17% of the average housing stock of countries in the European Union consist of semi-detached or row houses, meanwhile in the Netherlands, as stated, 51% of this dwelling type is used. This is a difference of 34% of the entire housing stock. Note that detached houses, like villas, are not added in this calculation. Interestingly, the preferred dwelling type in countries of European Union are flats or apartments, concerning 46% of the housing stock. In the Netherlands this is only 36%. In addition, the Netherlands is, behind Europe's microstates, the most densely populated country in Europe (Statistics Explained, n.d.; European Union, 2020).

This reveals and strengthens the statement that this paradigm is used in tradition. In this way, the Row House Paradigm became "*a (scientific) tradition*". Therefore, the question arises if row houses, and single-family homes, are the correct dwelling type to use in the future concerning the changes in demography.

	Netherlands	Europe	Difference
Flats (Appartments)	36%	46%	-10%
Detached houses	13%	36%	-23%
Semi-detached houses/Row Houses	51%	17%	+34%

Table 3.2: Dwelling types in Europe and the Netherlands (Statistics Explained, n.d.; CBS Statline, 2021)

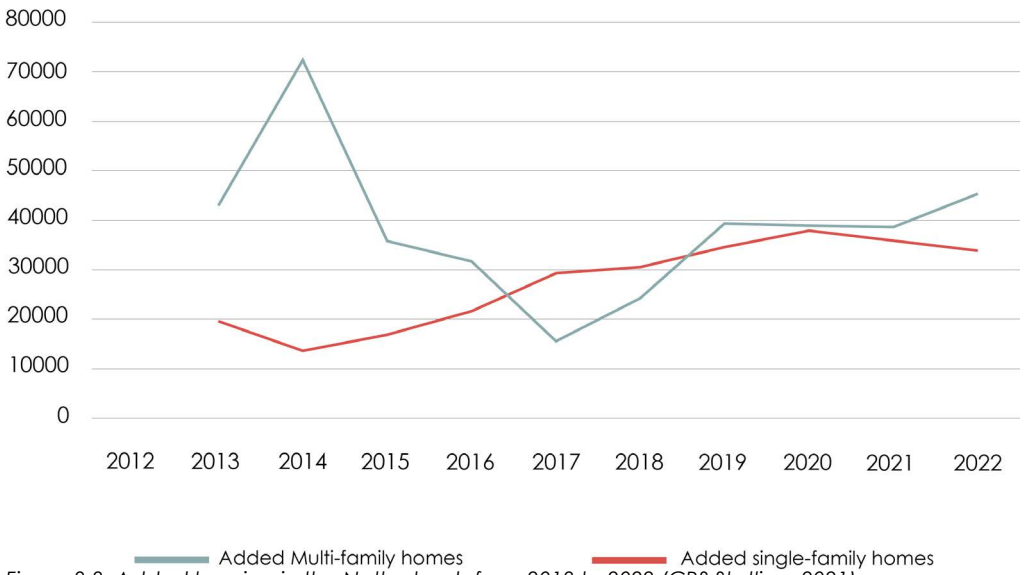


Figure 3.3: Added housing in the Netherlands from 2013 to 2022 (CBS Statline, 2021)

Reasons for the paradigm
Kuhn (2012) claims that paradigms are strongly tied to *'normal science'*, which acknowledges prior instances of scientific practice. It is therefore interesting to identify the instances of the practice of the Row House Paradigm. The opinion of the existence of the Row House Paradigm can be linked to various instances and has an impact across many fields. The spatial domain is obviously the most crucial and concentrated in the context of this thesis. However, the paradigm also has an impact on the social and economic domains, which have a significant impact on how this paradigm is implemented in society.

In his book 'Een land waarover is nagedacht' (A country that has been thought about), Lörzing (2021) explains the reasons behind the current appearance of the Netherlands. The book is also used as a source in the second chapter of this thesis. Lörzing identified that spatial planning is the important factor in this matter. Interestingly, his story does not start in 1901 when the Housing Act (woningwet) was introduced. He starts his story in the twenties and thirties of the last century. *'Low-rise construction in traditional style and lots of greenery ... approaching the atmosphere of a village in the middle of the big city'*, Lörzing writes (2021, p 16). The unawareness of the desire for small scale housing in the Netherlands, both in the past and present, is revealing and telling. In their critical views towards adding apartments to densify cities in the Netherlands, Keers & de Zeeuw (2020; 2022a; 2022b) often refer to the national housing preference research (WoON 2018 & 2021) (Stuart-Fox et al., 2022). They state a single-family home is more often preferred than an apartment and therefore, needs to be build extensively. The desire for small scale housing in the Netherlands (Nawijn, 1986; Lörzing, 2021) could be seen as the cultural foundation of this paradigm.

On the spatial domain, the Row House Paradigm offers 'less' amenities, like suburbanisation and urban sprawl suggest. But the enjoyment of residential life is more sought in the connection with neighbours and, overall, the history of the place (Vanstiphout, 2011). Spatially, the paradigm ensures a large use of space. The low density of the Row House Paradigm offers more spacious and greener environments (De Vries, Van Amsterdam & Thorborg, 2006; Geuze, 1995). This creates more hospitality, cosiness and differentiation of the neighbourhoods (Nawijn, 1986), which are also important factors on the social domain. The paradigm stands for a clear separation between living, working and recreating, both spatially and socially. This means that the distance between these is significant. On top of this, the density is low in the paradigm. Therefore, the use of the car, which the paradigm ensures (Geuze, 1995; Reijndorp, 2012), is significant and necessary to cover these distances.

A more detailed look on the social domain, on top of hospitality and cosiness, reveals that living in the paradigm ensures a certain prestige to people, which is culturally imbedded. Evidence of this are the national housing preference researches (WoON 2018 & 2021) which Keers & de Zeeuw (2020; 2022a; 2022b) often refer to. The high preference in single-family homes as choice of living environment enhances this paradigm on the social and economic level, prove that Keers & de Zeeuw function from within the paradigm (2020; 2022a; 2022b). As Kees Dol points out: "*There is a market for flats, however many people prefer a house with a garden, because a flat is often smaller*" (NOS, 2017). In addition, the growth of individualism and liberalism contribute to the paradigm. My house, my home, I decide. The paradigm is a portrayal of the preference by the population to won a house with an independent entrance and garden (Hulsman & Kramer, 2013). This is portrayed as a very distinct difference in public and private property, in contrast to multi-family homes. Since row houses often include front- and/or backyards, sharing a green space won't be relevant (Nawijn, 1986).
In addition, the paradigm became successful in a time where there was little social concern about sustainability (Vall-Casas et al., 2016). This is manifested in space-use, the jeopardising of green landscapes and the increased consumption. Comparable to what happened in the United States after the second world war (Cohen, 2003).

The paradigm also is of great influence in the economic domain. The row house was a very buildable asset, for both planners, designers and housing corporations. It was easy to build in order to tackle the housing shortage of the Netherlands after the second world war. Row houses became the figurehead for prefabrication and standardisation (Hulsman & Kramer, 2013) and therefore, maximizing benefits for individual developers (Vall-Casas et al., 2016). The suburban landscape is traditionally developed on demand by focusing on single plots, which is the same in the Row House Paradigm serving developers. Building row houses is simpler and less expensive than building apartment blocks for both practical and financial reasons (Hulsman & Kramer, 2013; Nawijn, 1986). The row house has been used in a variety of urban eras throughout history, demonstrating its ease of adaptability to any urban form or fabric, as stated in the subchapter ***"Urban Environment in the Netherlands"*** of the previous chapter. Different preferences in anonymity, architecture and urban form formed in the different urban era's. These instances could be resolved within the constraints of the Row House Paradigm, further strengthening the paradigm's conceptual basis in those years.

Limitations

Kuhn calls normal science "*puzzle-solving*" (2012, p. 24), where the scientist tries to solve a problem within that paradigm with tools and concepts that exists in that paradigm. This puzzle-solving within an existing paradigm is happening because an "*anomaly*" has occurred. The discovery of a new and unsuspected phenomenon. This anomaly can be solved within the parameters of the existing paradigm. In the past, scientists haven't yet been able to sort this anomaly by using the tools and concepts, which are the foundation of that paradigm's theory. New tools and concepts within the paradigm first have to be discovered. If this isn't the case, a crisis within that paradigm occurs. In a time of crisis, the scientists lose their confidence of solving the anomaly and begin questioning the foundations of concepts, theories and methods of the paradigm. They become interested in new phenomena and start considering alternatives. This leads to the birth of a new paradigm. Kuhn claims: "*... an existing paradigm has ceased to function adequately ... to which that paradigm itself had previously led the way*" (2012, p. 92-93). This is where Kuhn introduces a scientific revolution, the paradigm shift.

Positioning
When anomalies go beyond what the Row House Paradigm can handle, they turn into, what Kuhn calls, crisis. Cities inherently have a variety of living environments. This thesis takes the stance that the Row House Paradigm is not always negative. Certain lifestyles and values must be accommodated and generated by the living environment, this in itself contributes to diversity. In terms of sustainability and future-proofness, it does fall short on a few instances. The goal of this thesis is to identify and explain these instances. In the Paradigm, the thesis identifies certain urgencies. If these urgencies could be fixed within the parameters of the paradigm, they are anomalies. They become a crisis when they can't be fixed within the paradigm. This thesis aims, as the title suggests, towards the limitations of the Row House Paradigm, identifying what is possible within the paradigm. As seen in the previous subchapter, the Paradigm is more than a building type. It is hold together by instances in the social, spatial, economic and even cultural domains. It is interesting to identify these urgencies and limitations.

One urgency suggests the way these neighbourhoods were designed are out dated. The neighbourhoods, the Row House Paradigm represents, were designed in different times and urban eras. Von Meding et al. write: "*The city was designed for 1970's values however, our housing needs have shifted in the last decades*" (2021, p. 4). According to Rosol (2015), to mix population with different social backgrounds with different dwelling types generates the possibility of enhancing the social cohesion in the city. This is not possible if the majority of the housing stock is focused on a specific socioeconomic group of people with a certain lifestyle connected to that. Therefore, an urgency of the Paradigm is to identify if there is a possibility of using different dwelling types within the paradigm.

Anomalies & Urgencies
In his book Cities Full of Space, Uytenhaak (2008) maps, on an abstract basis, the evolution of space use between 1900 and 2050. According to his estimates, in 2050, a home of two people would occupy approximately 195 m2 of space (97,5 m2 per person). This was 72 m2 and 4,5 person per household in 1950 (18 m2 per person). This demonstrates how the use of living space has dramatically expanded over the past few decades (*figure 3.5*). According to Von Meding et al. (2020) this also applies to the current spatial challenges in the entire country, apart from social and cultural challenges. As more people move to the Netherlands and pressure for space increases, we in the Netherlands must develop strategies to make better use of available space. The low density of housing can be seen as a major urgency in the Paradigm. A more compact city is therefore needed to make the use of space more efficient. It also has the ability to improve and enhance the quality of life because of various reasons (Elkin et al., 1991; Breheny, 1992,).
An effect of this low density is the appearance of urban sprawl. In general, urban sprawl creates more car-use because the low proximity of amenities (CBS, 2020; Vall-Casas et al., 2016). As seen in the figure 3.4, the less urban the environment, the more the car is used as primary mobility to reach certain amenities. This means, in general, that the lower the density of housing the use of cars is higher. In contrast, mix-use areas introduce more variety and vitality of economic activities in the urban fabric and is seen as a significant instrument to create and maintain sustainable urban environments (ECTP, 1998; Hoppenbrouwer and Louw, 2005).

The consumption-based society is also reflected in the Row House Paradigm (Reijndorp et al, 2012). In an era when issues related to nature, biodiversity, and climate are crucial, we must consider whether the consumption-based society embodied by the Row House Paradigm is still desirable.

To conclude, these are the main reasons why the row house is the so called figurehead of Dutch architecture (Hulsman & Kramer, 2013) and why the Row House Paradigm is current as the primary way of developing dwellings in the Netherlands. Kuhn (2012) describes something that is much more important. A paradigm gains its status because it is simply better in solving solutions than its competitors. It is that during paradigm shifts, the scientist often sees new and different things in their familiar instruments. The reason for this is because they look at places they haven't looked before. A new world view. This is the important aspect of a paradigm shift. To look differently and in different lights to the used concepts, theories and methods for a new world view. This is the reason of the title of this thesis being focused on identifying the limitations of this Row House Paradigm.

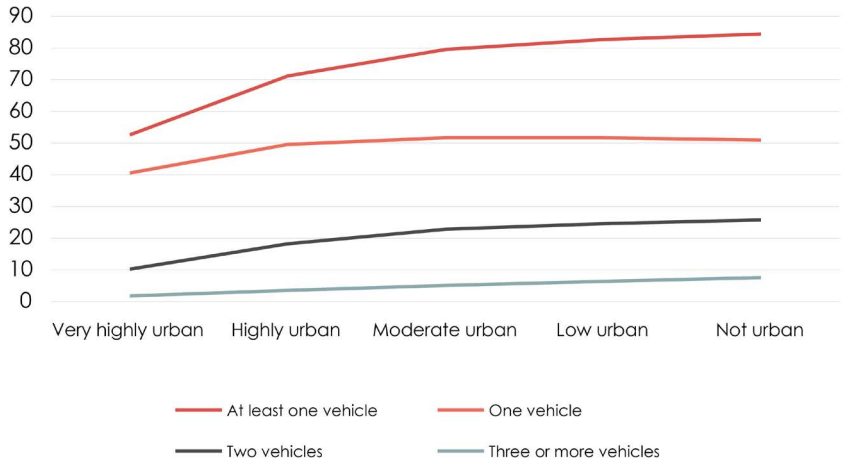


Figure 3.4: Urbanity of car-owning households (CBS statline, 2015)

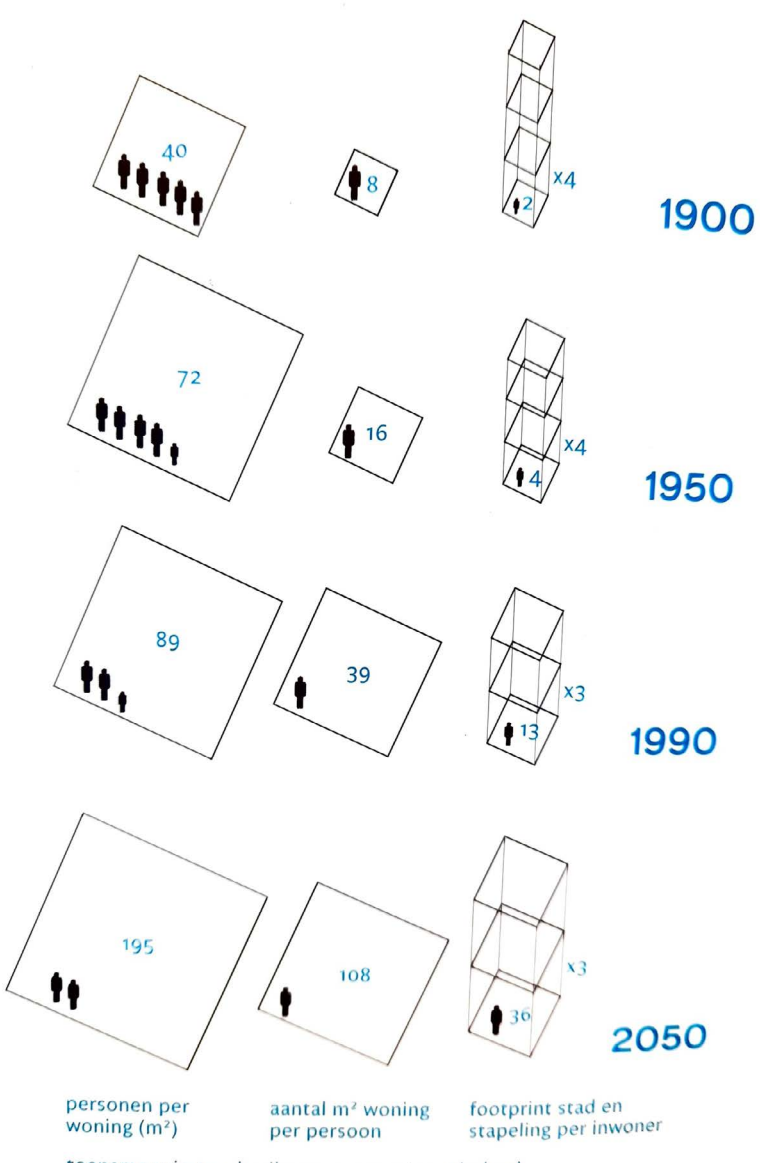


Figure 3.5: Increase in use of space per person in the Netherlands (Uytenhaak, 2008)

Figure 3.6: View from Gooioord in Bijlmer, a district in Amsterdam (Teper, 2008)

The failure of high-rise in the Bijlmermeer meant the row house could thrive and become successful.
In this way, it became the figurehead of Dutch urbanism.
(Hulsman & Kramer, 2013)

Figure 3.7: Achterwerf, a typical cauliflower neighbourhood from the seventies (By author)

"Typical row house is the quiet street, green parks, front- and backyard and the similarity between other houses."
(Hulsman & Kramer, 2013, p. 10)

4.

THE CASE OF ALMERE

Figure 4.1: Topographical map of Almere and surrounding landscape (PDOK, 2020)

The Challange

In the 1960's, Almere is designed as a 'flow-over' city of Amsterdam (Berg, 2007). Therefore, Almere was long considered synonymous as an residential area of Amsterdam. The large amount of neighbourhoods in Almere are considered suburbs from the post-war era with low density. The main foundation for the construction of Almere as new town in the Netherlands results from prognoses for the post-war era for an increase in population, welfare and the rise of a new middle class (Lörzing, 2021; Reijndorp et al., 2012). This lead to a tremendous demand for housing in this segment. As a reflection of this 'affordable luxury' the design resulted in a suburban city (Berg, 2007), aimed towards a specific socio-economic group of people. Hulsman and Kramer interestingly call Almere the '*capital of Row House Land*' (2013, pp. 18).
In addition to Almere's history, the present is at the starting point of identifying a new direction to aim for. Recent vision documents from the municipality revealed the desire of policymakers that Almere will lose its biased identity as a living city (woonstad) (Oosterhoff et al, 2012; Gemeente Almere, 2021; Gemeente Almere & Metropoolregio Amsterdam, 2020). This will be achieved to proclaim Almere 2.0, with a so called 'scale jump' (Gemeente Almere, 2021; Oosterhoff et al, 2012). This scale jump will aim towards becoming the fifth city of the Netherlands and a valuable force in the Randstad region.

Context

This chapter will begin by describing of the setting of the Dutch city of Almere, in order to give readers a better understanding.
Almere is located in the Dutch province of Flevoland. The city is part of the greater Amsterdam Area, called Metropoolregio Amsterdam (MRA). In this way, the city is also located at the outer regions of the Randstad Area (see *figure 4.2 & 4.3*). According to Rocco (2011), the municipality of Almere classifies as an urban surrounding in the Randstad area. Therefore, the connection to Amsterdam is extremely important to Almere. The provincial capital of Flevoland, Lelystad, is located to the north of Almere. Apart from this connection, Almere's primary orientation to its neighbours is to the south and west, or the Randstad Area, as shown by the lack of connections to the north and east. This is best illustrated in Figure 4.5.

Figure 4.2: Location Almere (in red) in the Randstad region (Rocco, 2011, modified by: author)

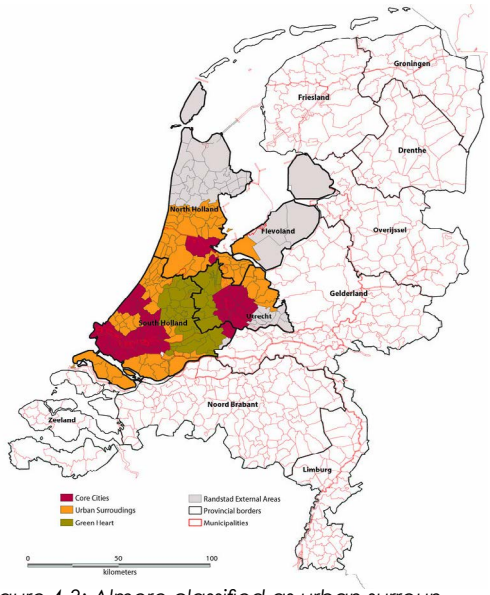


Figure 4.3: Almere classified as urban surrounding (Rocco, 2011)

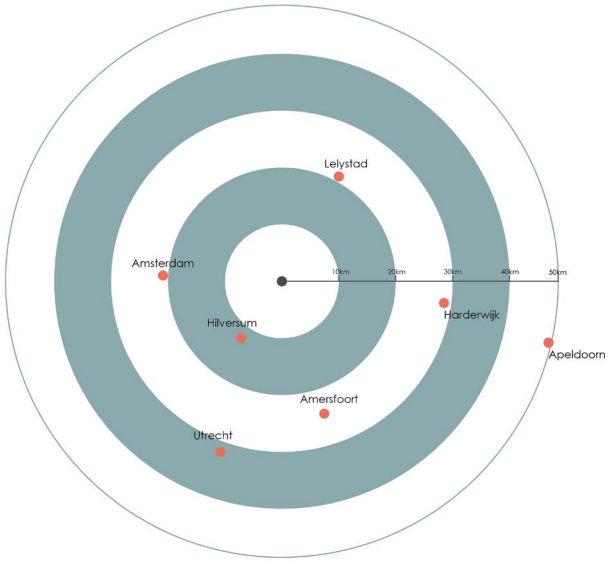


Figure 4.4: Proximity of cities near Almere (By: author)

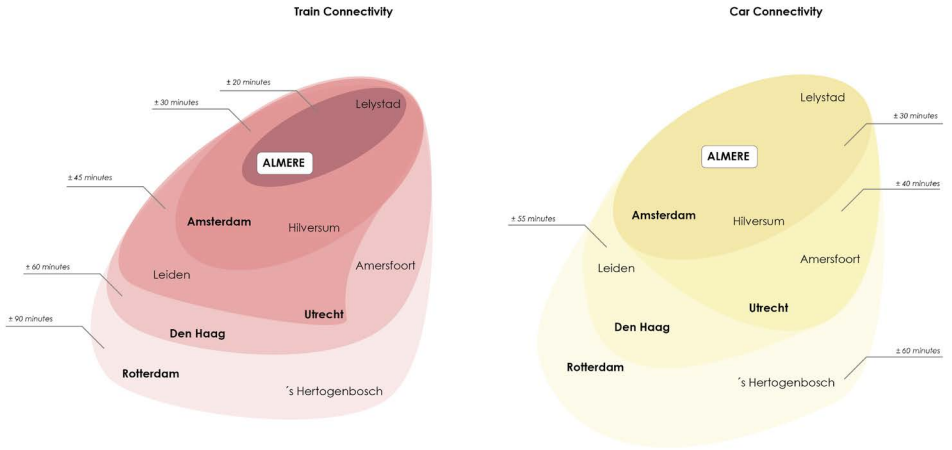


Figure 4.5: Accesibility to other cities (Train and Car) (By: author)

Design Principles of Almere

History
Almere is one of the youngest city in the Netherlands. A great deal of thought and effort has been put in designing a new city from scratch. In his book 'Almere; hoe het begon (Almere; How it started)', Nawijn (1986) describes this process. The first designs of Almere originate from the post-war era, where the national government of the Netherlands made plans, for the country in its entirety, to tackle the housing shortage of that time. By assigning so called 'Groeikernen' (Growth Core; villages where a lot of additional housing would be build), the government tried to force municipalities to build considerable amounts of dwellings. With the reclamation of land from the 'Zuiderzee', the idea of new cities began to rise. The Rijksdienst voor IJsselmeerpolders (RIJP) (National Office for IJsselmeerpolders; responsable for the reclamation) started explorations to this new city in 1971 (Nawijn, 1986; Reijndorp et al., 2012). Cornelis van Eesteren was an important advisor to the Dienst der Zuiderzeewerken, which was responsible for the planning and design of the landscape of the IJsselmeerpolders. His influence in the design of Almere has been substantial (Reijndorp et al., 2012). Van Eesteren was the teacher of Teun Koolhaas, one of Almere's most important designers (Reijndorp et al., 2012) and the designer of the foundation of Almere; the Structuurvisie (Structure Vision) (Figure 4.6).

The Concept(s)
The multiple nuclei, or cores, approach of Almere was for the first time established in the report 'Explorations' (Nawijn, 1986; Berg et al, 2007). The report came to the conclusion that housing the intended 250.000 citizens in one large, compact city was not preferable. The phasing of building an entire new city was an important factor. The centers needed to be adjustable in order to create livable districts, they had to grow when matters and had to still be operational when construction paused or was completed (Brouwer, 1999). The second reason for choosing this method was to make the area, needed for the amount of inhabitants, more tangible for designers (Brouwer, 1999; Nawijn, 1986). Interestingly, the concept of the polynuclear city was not new. Ebenezer Howard's perception of a city without slums originated from is book 'A Peaceful Path to Real Reform' (Howard, 1898), a Garden City, was already a known concept. The idea was that a central core would be well connected to large and/or small surrounding cores by train or road.
In order to bring nature closer to people, greenery was placed in between

Figure 4.6: Structuurvisie Almere (Reijndorp et al., 2012)

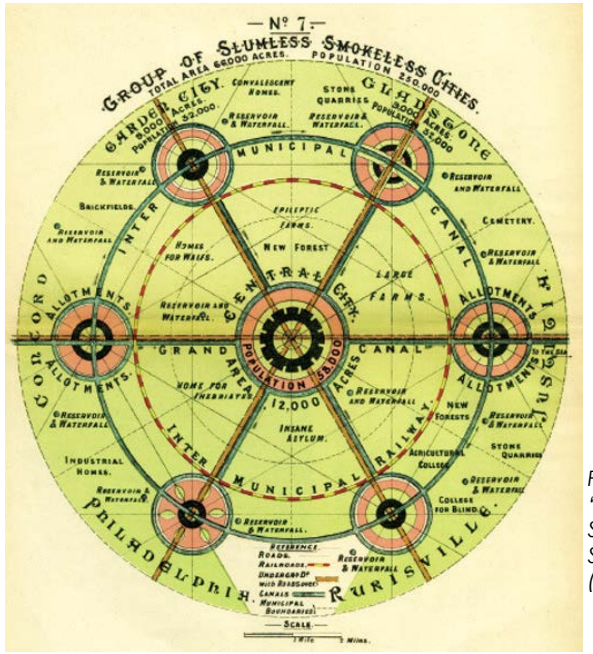


Figure 4.7: 'A Group of Smokeless, Slumless Cities' (Howard, 1902)

the cores, so called skegs (Reijndorp et al., 2012). The only difference of this concept compared to the original concept of RIJP was the hierarchy between the cores. Later, Almere-Stad was assigned as the primary center of the city. Almere is also known as a New Town. The New Town Movement was an evolution from the Garden City Movement (Osborne & Whittick, 1969). In England, a 'New Town Movement' was formed and advocated to ease overcrowding and polluting areas and to organise settlements in other places (Osborne & Whittick, 1969). The two movements were similar in that they both aimed to improve living conditions. The method used to accomplish that was the difference. The New Town Movement advocated the construction of new towns to ease pressure of the large cities and adapt to the housing demand. The Garden City Movement advocated making the living environment more green and therefore healthier. Reijndorp describes the urge to become the "ideal city", without any conflicts (2007, p. 67). This ideal shows much more features from the suburban ideal. Although, according to Reijndorp et al. (2012) the balanced population and self-containment in Almere has been neglected.

The Districts

The Garden City was the main concept used in the design of Almere. This resulted in different districts with each their own center, character and identity. Currently, four districts can be identified that divide the city as a whole.

The main district is Almere-Stad (translated to Almere-City). This district is home to the major railway station as well as the city's commercial hub. There are also regionally important facilities located here, such as a hospital. Almere-Haven (translated to Almere-Harbor) functions as the rural suburban neighbourhood with the identity of 't Gooi. A region across the Gooimeer known for it's green and rural identity. This identity is captured in the organic form of the urban blocks and green structures. Although there are a few conventional streets in this area, it is primarily a cauliflower district with residences informally clustered around "woonerven" (Hulsman & Kramer, 2013). Almere-Buiten (translated to Almere-Outside) suggests the identity of the outskirts of the city. The nearby Oostvaardersplassen, a nature reserve, increases this identity. The transition towards the rural area is important here. The fourth district is Almere-Poort (translated to Almere-Gate) and functions as the gateway to and from Almere to the Randstad. Through this district, the main infrastructures enter the city. The district will also play a critical role in the proposed Amsterdam Bay Area idea (Gemeente Almere & Metropoolregio Amsterdam, 2020). Almere-Pampus, named after the island of Pampus near Amsterdam, will be a future district mainly connected to the Amsterdam Bay Area project but is still to be realised. Almere-Hout is a special case. This is a district with a lot of participation and a new concept. This district is reliant on private initiatives and do-it-yourself initiatives. In this thesis, it is decided to designate the first four districts named as the city of Almere.

Figure 4.8: Districts of Almere (by: author)

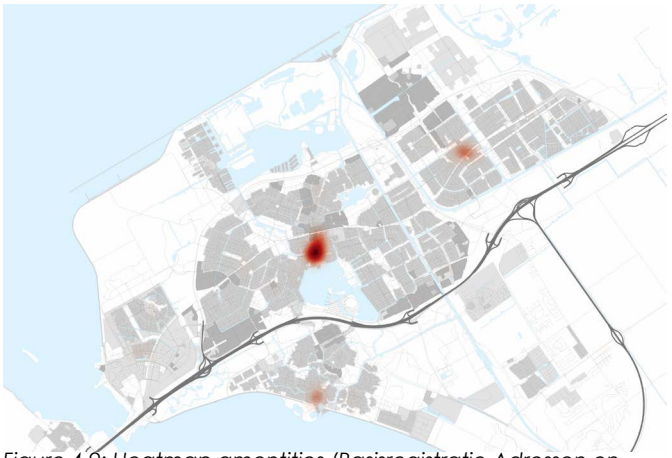


Figure 4.9: Heatmap amentities (Basisregistratie Adressen en Gebouwen, 2021)

'De Woonstad' (The living city)

Song and Quercia (2008) characterise the 'American' suburban neighbourhood as low density, private yards, winding cul-de-sac streets, urban fringe locations without access to transit and homogeneous tracts of single-family houses. This is mainly the result of the way of thinking in the time Almere was designed. The view towards society in the 1970s focused on the increasing prosperity, mobility, consumption and free time for middle-class families (Song and Quercia, 2008; Reijndorp et al., 2012). Reijndorp et al. state: "*The democratisation of suburbanisation was aimed towards the emancipation of the broad middle class*" (2012, p. 35). This resulted in a suburban lifestyle in the city which would coincide with the new urban orientation of the Amsterdam region. In other words, live in Almere and work in Amsterdam (Reijendorp et al., 2012). The building type of choice became low-rise housing, these were preferable rather than high-rise buildings. Due to the failure of the Bijlmer, the designers focused on the familiar urban planning theory (Reijndorp et al., 2012). According to Nawijn (1986) three factors led to the realisation of low-rise buildings. The first reason was socially substantiated, low-rise would suit the future population better. Reasons for this was, again, the growing middle class in the Netherlands and the expected population consisted mostly of young families in this class. The second reason was financially, realising low-rise is predominantly cheaper than high-rise. The third reason was an operational one. The design team decided against using high-rise as a housing alternative due to ethical considerations. This strengthened even more the idea, perception and identity of Almere as being a 'suburban neighbourhood' of Amsterdam. This suburban goal also fitted the anti-urban sentiments of the managing directors of the RIJP, Will Otto and Roel van Duin (Reijndorp et al., 2012). The housing stock of Almere is comparable to that of the entire Netherlands. Similar to the rest of the country, about two thirds (63%) of the housing stock in this city is made up of row houses (CBS Statline, 2022). An even larger amount for single-family homes. Apartments or multi-family homes are located near or inside the urban centers. The density in population is also higher in these areas. Most of the detached and semi-detached dwellings are located on the periphery on the city. This enhances, in combination with what has been told in the green structure heading, the transition towards the rural landscape outside the city, in order to make the transition between the city and the environment more natural. These villa-neighbourhoods are characterised by their green character. Row houses and semi-detached homes are frequently found in the areas between rural and urban areas.

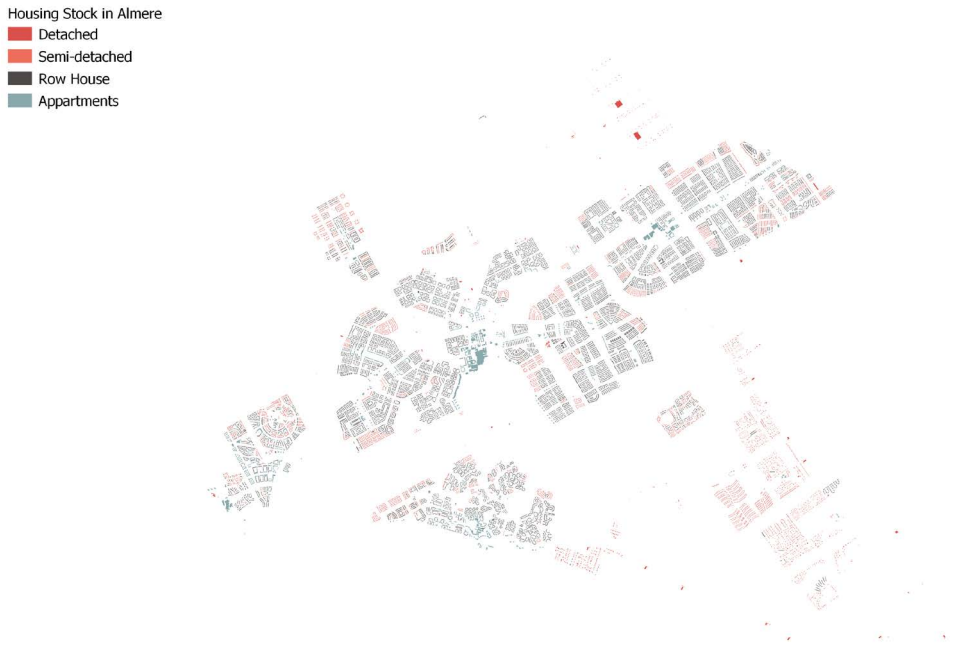


Figure 4.10: Dispersion of dwelling types of Almere (Basisregistratie Adressen en Gebouwen, 2021)

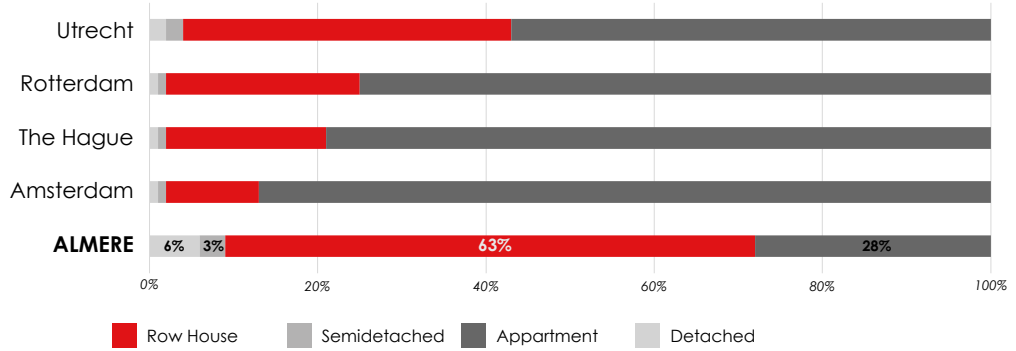


Figure 4.11: Dwelling types compared to G4-cities (CBS Statline, 2022)

Values of the Urban Environment in Almere

The main design principles of Almere were discussed in the previous subchapter. This subchapter will use these principles to identify the main values of the urban environment of Almere, in a quest to identify the strengths and opportunities for future developments in the city. The main values for urban design are considered street patterns, land uses, height and type of buildings and densities. Travel, mobility, community interaction and ecological design features are on the second tier (Wheeler, 2003; Reijndorp et al, 2012).

Green structure
One of the main principles of the Garden City, and partly New Towns, is the equality between nature (green and blue) and the urban environment (red). This meant that the green-blue network was designed and created first, so the urban could benefit from this. According to the municipality, the existing urban nature adds qualities to the urban environment and enhances healthy living conditions (Berg et al., 2007; Gemeente Almere, 2021). The increasing spare time of the middle class enabled to spend more time around the house and living environment. The recreative function of the green structure became an important aspect in the design on the city scale (Reijendorp et al., 2012).

The designers combined this with so called "mental areas" (Nawijn, 1986, p. 41). A new notion from the field of environmental psychology.
This quality descends even towards the neighbourhood scale. The quality of the suburban neighbourhoods is increased by enhancing the relationship between city and countryside, in which buildings and greenery are equal (Nawijn, 1986).
The first sketches of Almere by Teun Koolhaas represent the mixing of nature and urban. Koolhaas mentions that in a short amount of space, people are confronted by both urban and rural (Reijendorp et al., 2012). This establishes the identity of Almere (Gemeente Almere, 2021). Currently, most of the surrounding green are spaces used for agriculture. The surrounding area contains cultivated forests rather than naturally-grown ones. Forests are found near the outskirts of the city, providing a better transition between the urban and rural. The green structures in the city are often used for recreational purposes. The majority of these green structures, which serve a recreational function, are underutilised. These places are frequently viewed as being very monocultural (Shaftoe, 2008). This means that they lack diversity in terms of function and appearance as well as biodiversity. Examples of this include Evenaar in Almere-Buiten (figure 4.14), where the traffic swallows the green, and the northern edge of Muziekwijk (figure 4.13).

Figure 4.12: Green Network (Centraal Bureau voor de Statistiek, 2017; modified by author)


Figure 4.13: Underutilised green Muziekwijk-Noord (By: Author)


Figure 4.14: Swallowed green Almere-Buiten (Evenaar) (Megaborn, n.d.)

Urban fabric
The urban fabric of the city hints on the difference between amenities and living. In comparison to industrial areas and urban centres, the living environment has a smaller urban form (figure 4.16). Industrial areas are found near infrastructure and at the edges. In general, the urban form of Almere suggest small scale urban fabric, mainly suburban.

Infrastructure
In addition to the green structure, the infrastructure plays an important role in the quality of the city. The green structure became 'a carrier for the urban' (Reijendorp et al., 2012, pp. 109). Motorised traffic is diverted to the outside of the city and becomes less important than housing. This results in a city center with an optimal accessibility by public transport (Reijndorp et al., 2012).
This resulted in two major linear structures traverses the city. These are the highway and railway. The lines connect three districts. This results in the separation of Almere-Haven from the rest of the city, enhanced by the highway (figure 4.15). This ensures the different position of Almere-Haven in the city structure of Almere. The district's character is impacted even more significantly by this, by being separated from the other districts, the character and identity of a rural village was ensured.
Another important structure through the city is the public transport. In addition to the separation of amenities and dwelling areas, public transportation and regular roadways are separated as well. Separate bus lanes that use their own roadways and are inaccessible to regular transportation exist in Almere. Five train stations in Almere follow the railway, which is a significant amount (Gemeente Almere, 2020). Two of those stations are so called 'intercity stations'. Which is a (direct) connection to a major city in the Netherlands. Regional trains stop at every station, ensuring a significant connection to the region.
Public transport was an important pillar for the urban design (Nawijn, 1986; Reijndorp, 2007). This is best shown in the coverage of bus stops in the city (figure 4.17). The bus lines run through the city in a way that a large part of the urban environment is within 400 meter of a bus stop. This public transport infrastructure forms a great opportunity for exploiting transit oriented development. According to the Mobility Vision of the municipality, transit oriented development will be one of the four main guiding principles for the coming years (Gemeente Almere, 2020). This means intensifying urban developments near stations. According to the municipality (Gemeente Almere, 2020), pedestrian and cycling focused public space near and around stations should be the main carriers for design. However, bus stops also have an opportunity in increasing transit oriented development.

Figure 4.15: Main infrastructure (Centraal Bureau voor de Statistiek, 2017; modified by author)


Figure 4.16: Urban Form (Centraal Bureau voor de Statistiek, 2017; modified by author)

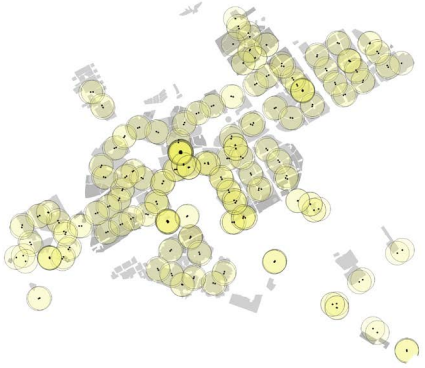


Figure 4.17: Bus stops with 400 meter radius (modified by author)

Living Environments

The important scale suburbanity aims towards is the neighbourhood scale. The values of suburbanity are the most present in this scale.

In 2006, the than ministry responsible for spatial planning, housing and mobility (VROM), identified five main living environments, the VROM-living environment typologies. These are; Central Urban, Outside Center, Green Urban, Center Village and Rural Living (De Vries et al, 2006).

Central Urban consider -historical- inner cities, new urban centers and centers of new towns. The essence -or value- of this living environment is centrality, a relative high density and a high amount of mix-use.

Outer Center is often the layer around the center. A compact monofunctional living environment, the urban neighbourhood.

Green Urban is a monofunctional living environment but often with a low density. They are spacious and green in design. Mostly expansion projects and growth cores are considered Green Urban. The essence is the house with a garden. This environment as an extensive suburban character. Village-like Center are historical centers or new centers in relative small cities or towns. The essence is a multifunctional center on a smaller scale.

Last but not least is Rural Living. Low density is a green area with a lack of amenities. The essences are villa's, rural life and lordships

These living environment are projected on Almere on the neighbourhood scale and can be seen in the figure 4.18. The classification of Green Urban living environments applies to the majority of neighbourhoods. The qualities and values of the urban environment in Almere show that the city is fully equipped in terms of housing. The literature shows that from the moment of design, the focus quickly shifted to using the garden-city concept in combination with the new town concept, as discussed in previous subchapters. This had a major impact on the use of greenery in the city, which was used in extensive amount.

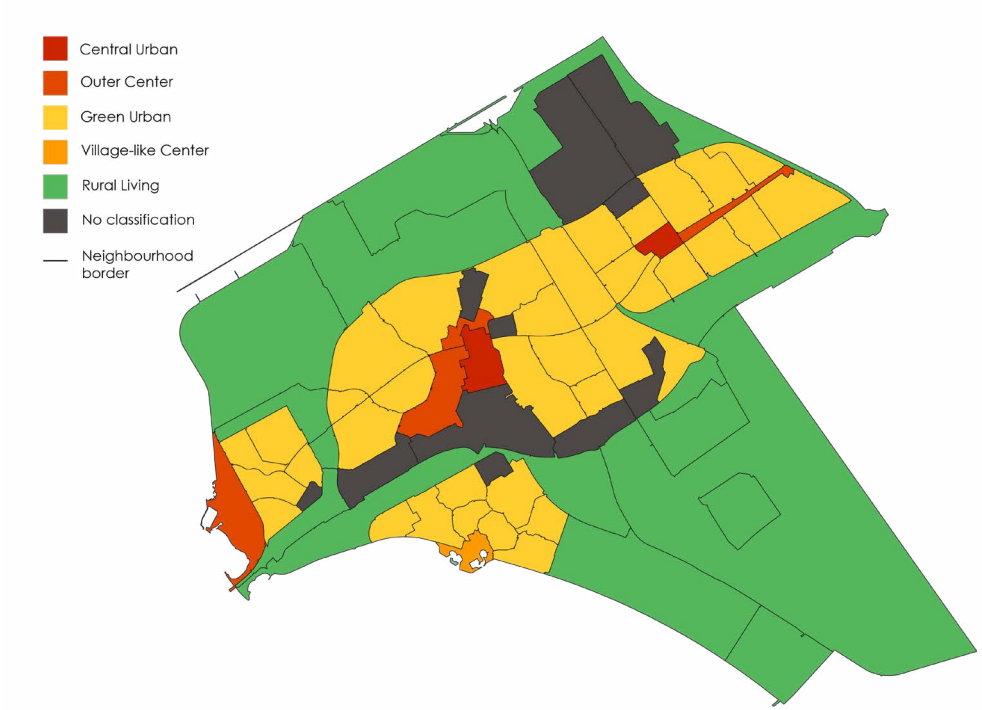


Figure 4.18: Living environments in Almere (by author)

Let us now identify the main qualities in the urban environment in different neighbourhoods across Almere, which originate from various time periods. The construction of the city of Almere started in the late seventies. The first buildings were built in the district of Almere-Haven. Even before construction of this district was completed, planners already started construction in the second district, Almere-Stad. This is the center of the entire city. During the eighties work in Almere-Haven completed and Almere-Stad grew even more. Work began in the third district, Almere-Buiten, at the beginning of the 1990s. The construction of the current districts lasted until the beginning of the new century and some are not yet completed to this day. Almere-Poort, the fourth district, began to be constructed in 2005. This district is still under construction, and the urban centre is not yet finished. The fifth district, Almere-Hout, which is a divergent district, began construction around 2010. This district is still unfinished as of this moment.

Throughout the Netherlands, two types of neighbourhoods dominate the urban landscape. The Bloemkoolwijk (cauliflower district) and the VINEX-wijk (which originated from the Vierde Nota Extra). This is also the case in Almere. After the mass production of row houses in the sixties (figure 2.8), variety in the bloemkoolwijk was obtained by an irregular placement of the building blocks (Lörzing, 2021). This led to intimate spaces, enhance by the placement of extensive greenery. Cars had to make way for playing children. The winding roads prevented cars from speeding through the neighbourhood. In these neighbourhoods, living rose even more to the top of the agenda. In 1995, the successor of the bloemkoolwijk broke ground. The VINEX-neighbourhood. One had to set themselves apart by adding even more variety (Lörzing, 2021). In the VINEX-neighbourhoods, row houses were frequently flamboyant and stood out more in the streetscape. The importance of anonymity, where modernist monotony was still significant in the cauliflower district, had diminished considerably. As Hawthorne, writer of the New York Times, stated: 'A suburb with architectural flair' (2004). The triumph of post-modernism was achieved (Lörzing, 2021). Officially, the urban era of the VINEX ended in 2005. However, many neighbourhoods build after this era where build towards the principles of that era. This timeline is also reflected during the construction of Almere and is still expressed to this day. From the cauliflower districts of Achterwerf in Almere-Haven, to an intermediate time era in Almere-Stad, to the flamboyant Regenboogbuurt is Almere-Buiten and the Post-VINEX era in Almere-Poort are all reflections of the important architectural and urban eras.

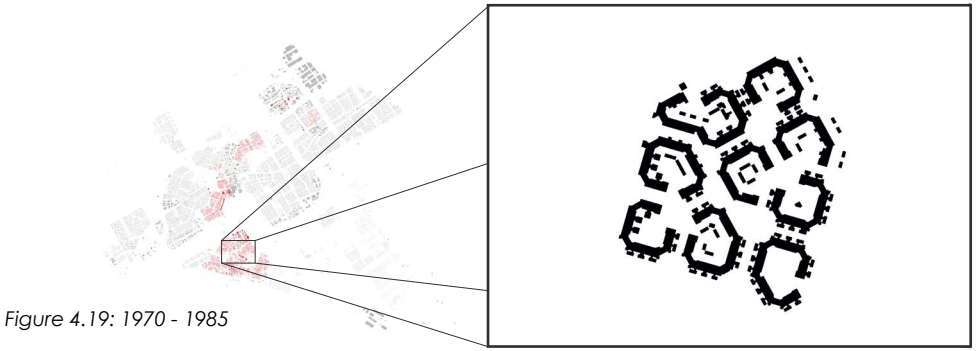


Figure 4.19: 1970 - 1985

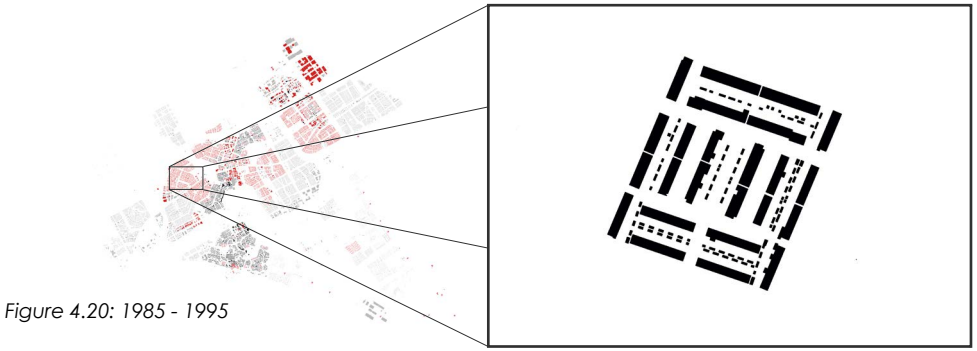


Figure 4.20: 1985 - 1995

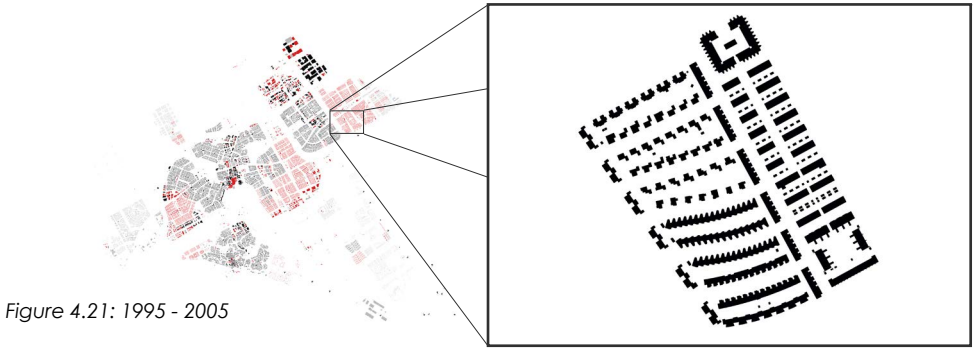


Figure 4.21: 1995 - 2005

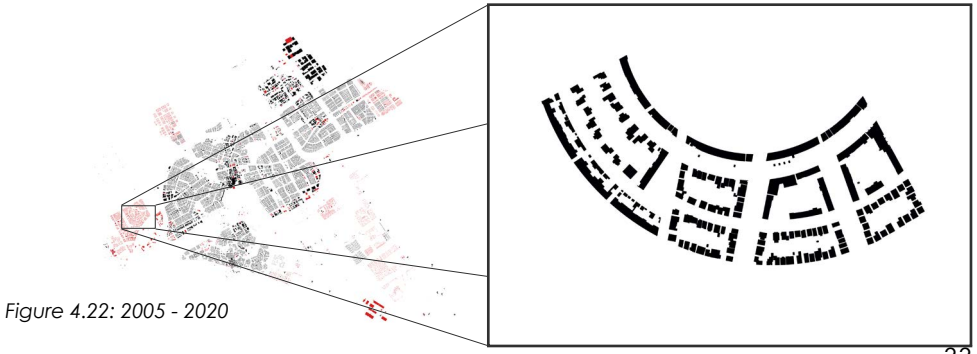


Figure 4.22: 2005 - 2020

1970-1985: Bloemkoolwijk

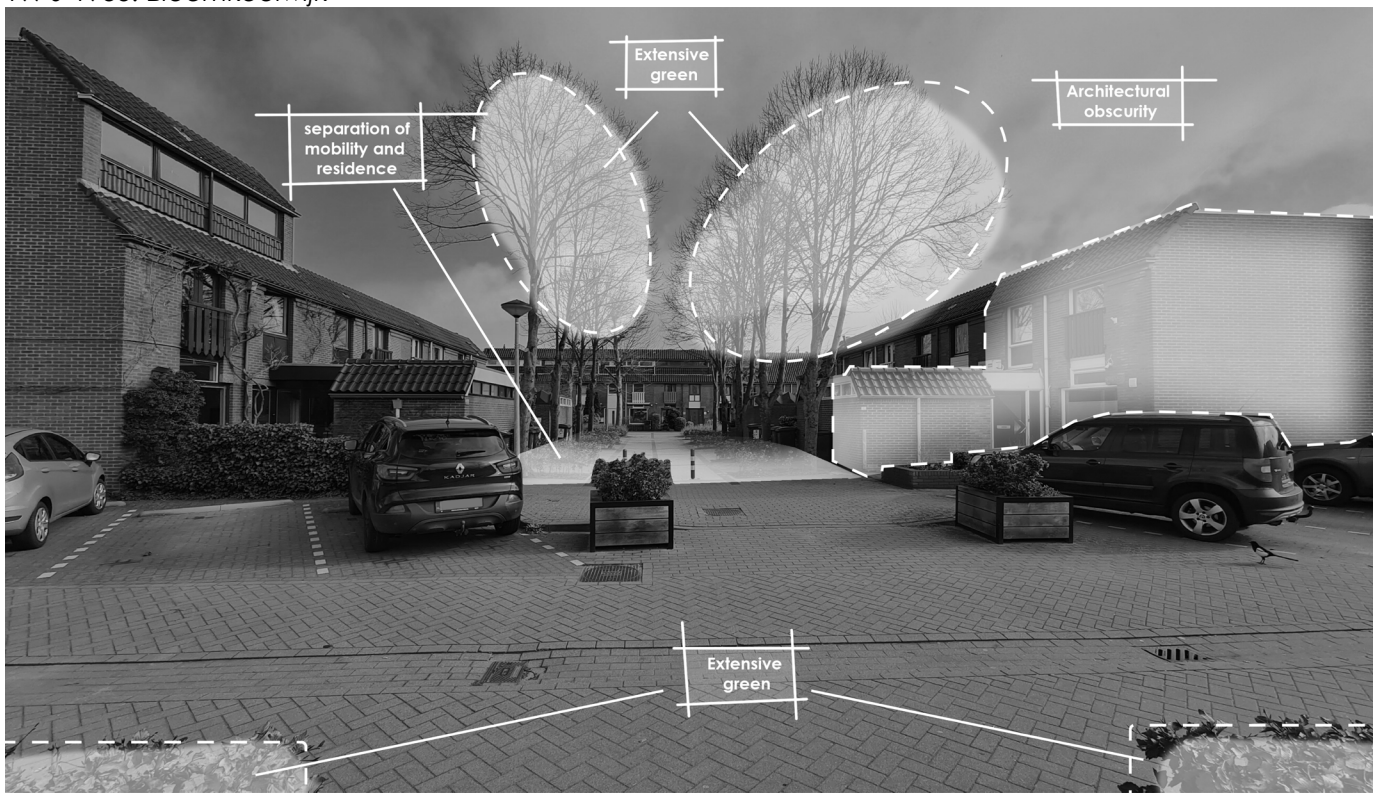


Figure 4.23: Achterwerf - Almere-Haven

Figure 4.24: Collective access to backgardens

Figure 4.25: Additional playground equipment

The neighbourhood of Achterwerf in Almere-Haven is a good example of the Bloemkoolwijk in practise. The street profile enhances the identity and character of this district by concentrating on the small scale. The division of the public space into areas for residential and mobility use serves as a visual representation of this. By incorporating physical elements (posts and planters), the separation between these two is even further accentuated, as can be seen in figure 4.23. The division of these two uses of the public space results in more room for greenery. Because of this, the neighbourhood has a distinctive green feel which is frequently associated with the Bloemkoolwijk. Often, there is a distinction between the front and back of the house. Cars frequently have access to the back of the house, while people on foot and on bicycles have access to the front. In some instances, this is the opposite. The space inside the urban blocks, which give access to the backyards, often offers a collective feeling to the neighbourhood (figure 4.24 & 4.25). Private playground equipment is combined with public playground equipment in these areas. Here, anonymity is more clearly expressed in interactions with other residents of the urban block rather than in relationships with the residents in different urban blocks in the neighbourhoods.
In terms of architecture, the buildings are remarkably similar. Architectural obscurity is typical in these neighbourhoods. Nevertheless, there are exceptions, and they have increased over time as a result of homeowners expanding their homes or painting their windows and doors a different colour.

1985 - 1995: Intermediate

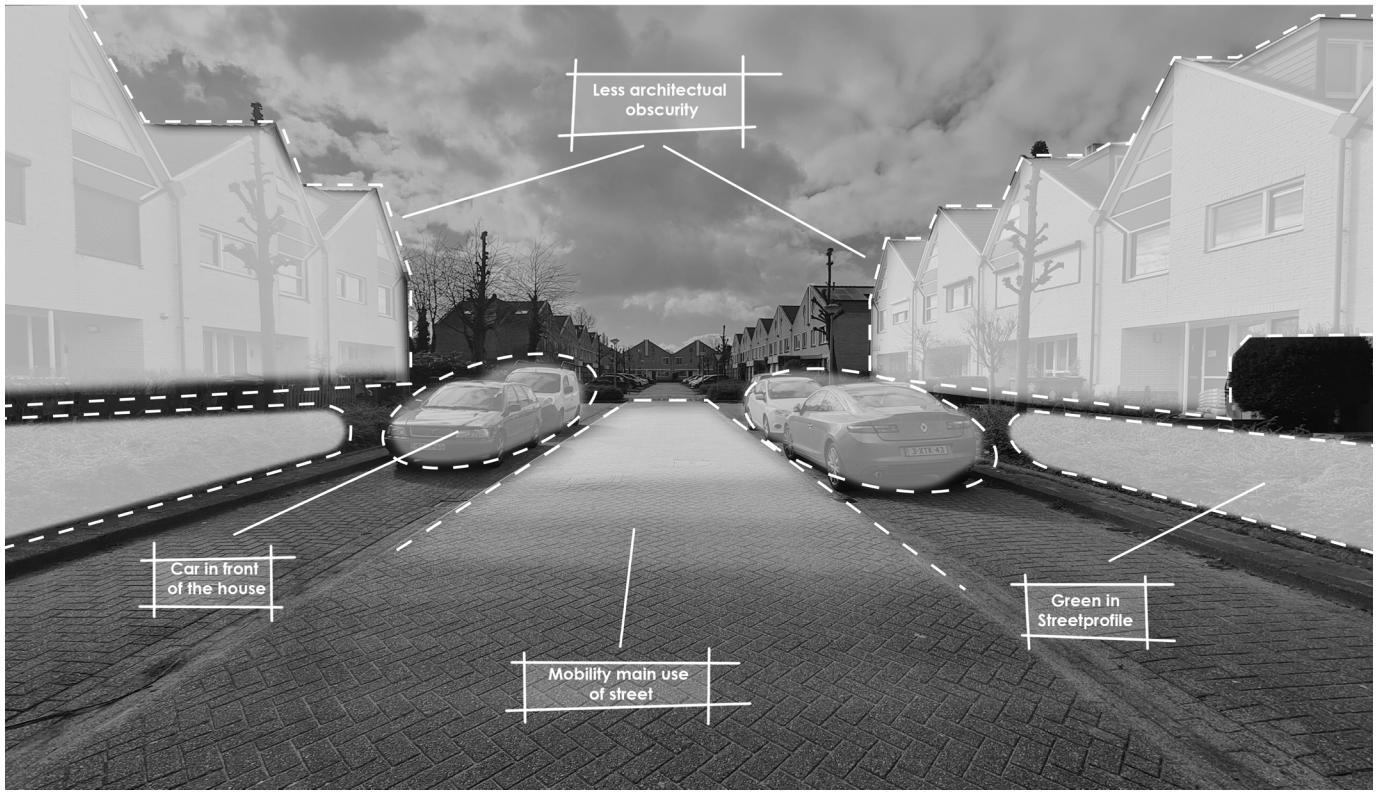


Figure 4.26: Muziekwijk - Almere-Stad

Figure 4.27: Blokfluitstraat - Almere-Stad

Figure 4.28: Dwarsfluitstraat - Almere-Stad

Muziekwijk in Almere-Stad is built around 1990. This is between the era of the Bloemkoolwijk and the VINEX. In this neighbourhood, a more straightforward approach to urban design took place of the Bloemkoolwijk concept. The urban form is straight and rectangular. The distinction between mobility and residence is rejected. Cars are now able to be parked in front of the house. Mobility is the main function of the street and uses the most amount of space in the street profile. The space used for parking is often shared with space for greenery, like trees or green areas. The backyards are accessible via a small path which runs between the backyards of two blocks. Here, anonymity is more expressed in less interactions with other residents of the urban block but to a lesser extent more to the neighbourhood.

Collective spaces, like parks and playgrounds are strategically places in the neighbourhood where intersections are more common. Architectural obscurity is less present in this neighbourhood. Individual houses are able to be identified. However, they still have similar appearances.

1995 - 2005: VINEX

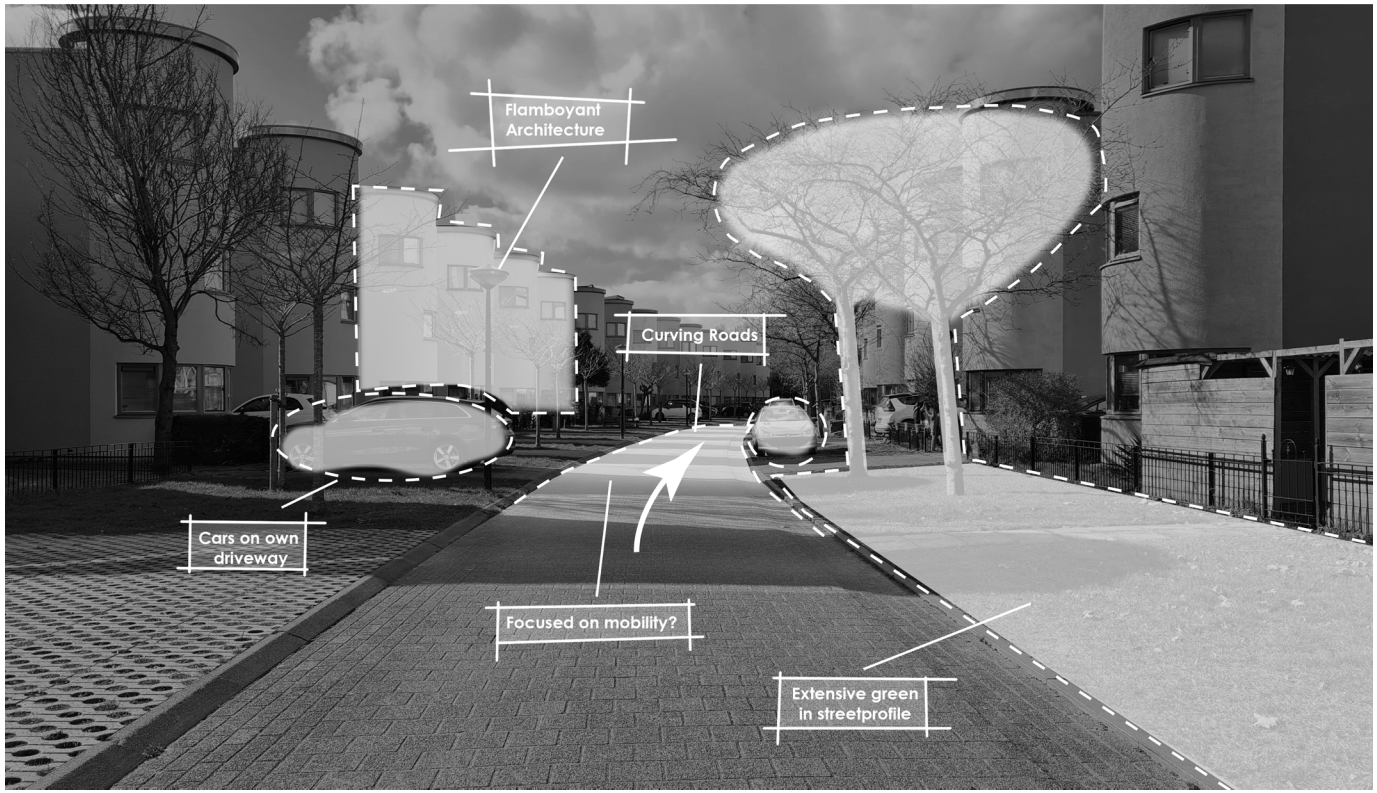


Figure 4.29: Regenboogbuurt - Almere-Buiten

Figure 4.30: Chamoisstraat - Almere-Buiten

Figure 4.31: Regenboogweg - Almere-Buiten

The Regenboogbuurt in Almere-Buiten is built in 1998, the peak of the VINEX era. This era of urban design can be distinguished by the flamboyant architecture. This can be seen in this neighbourhood as well. The buildings are built in a non-traditional style (figure 4.35). This time period saw a rise in the importance of expression. This included the use of colours, large windows, and curves. This made the neighbourhood less anonymous. Luxury has increased, and the street profile reflects this as well. Cars are able to be placed on the plot of land owned by the residents. Curved roads were reintroduced to the urban form, which had previously been rectangular and straight, to add excitement to the street pattern. The road emphasises mobility, though somewhat on a more modest scale. This makes it possible to stay in this area as well. The use of green in the street profile is enhanced by the lower scale of mobility function as well. The semi-green parking lots in this specific neighbourhood add to this. It resembled a 'residential park' idea (Berg et al., 2007).
The VINEX neighbourhood is also characterised by an decrease in proximity of amenities.
Often, a school or a supermarket can be found in near proximity of the neighbourhood. This value of the urban environment enhanced the community feeling of the neighbourhood.

2005 - present: Post-VINEX

Figure 4.32: Homeruskwartier - Almere-Poort

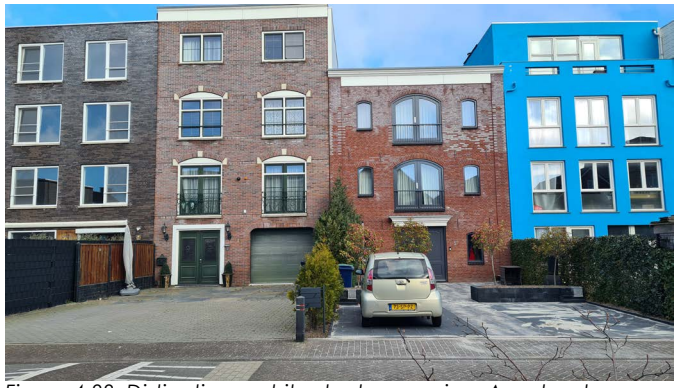


Figure 4.33: Distinctive architectual expression, Aresstraat

Figure 4.34: Various dwelling types, Hermesstraat

As stated before, the VINEX era ended officially in 2005. However, a large amount of neighbourhoods were, and are, still being built with similar elements of the VINEX-neighbourhood. One element which evolved was the architecture of the individual buildings. In the Homeruskwartier in Almere-Poort, the architecture chosen for this neighbourhood represents the mansions and warehouses along the canals in the city centre of Amsterdam. This expression in architecture is one of the main distinct elements of this neighbourhood, the architecture of choice being post-modernism. While still being situated in a row, and therefore considered a row house, the dwellings are expressed by their own architecture, decreasing anonymity entirely. These neighbourhoods also accommodate a variety of different dwelling types in close proximity to one another. Enhancing diversity among the residents. The street profile is more spacious. Like the VINEX, the possibility of parking the car on their own lot is enhanced. There is a clear distinction between mobility and stay in the street profile. Both using a large amount of space, leaving entirely no room for greenery. Curving roads continue in this neighbourhood to enhance excitement. As stated, the variety in dwelling types enhances the diversity in neighbourhoods. In this neighbourhood, this is even more enhanced by the close proximity of amenities. In this way, the mix use index (the surface area of amenities relative to the surface area of living) is significant in this neighbourhood.

Lifestyles in Almere

Before we can identify different lifestyles in Almere, it is important to better understand the demography on the social and economic domain.

Demography
However the urban environment might suggest, Almere is evolved into a diverse society. That is what Almere also wants to be: inclusive, undivided, enterprising, resilient and connected (Gemeente Almere, 2021). Interestingly, the population spread of Almere is comparable to the population spread of the Netherlands (Centraal Bureau voor de Statistiek, 2022), just like the dwelling types. The majority of the population of Almere is between 30-39 years old and between 50-59 years old. When compared to the four largest cities in the Netherlands (Amsterdam, Rotterdam, Den Haag, and Utrecht), the population is considerably older. This is a result of the absence of universities (Gemeente Almere, 2021).
It is notable that the various age groups are evenly distributed throughout the city. The elderly population is only in the majority in Almere-Haven, though. It is interesting to note how the denser neighbourhoods typically cluster near railways and train stations. This is probably due to the large number of apartments in these areas.

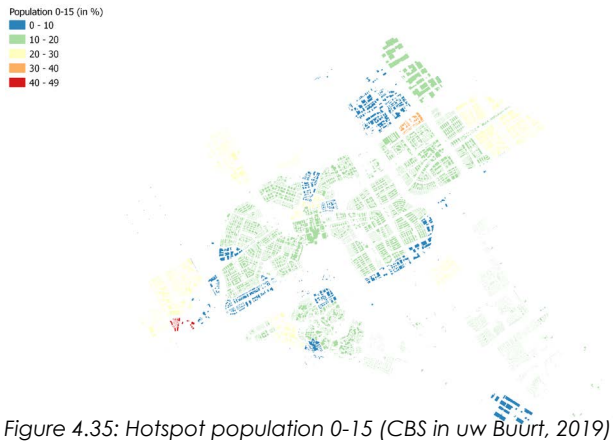


Figure 4.35: Hotspot population 0-15 (CBS in uw Buurt, 2019)

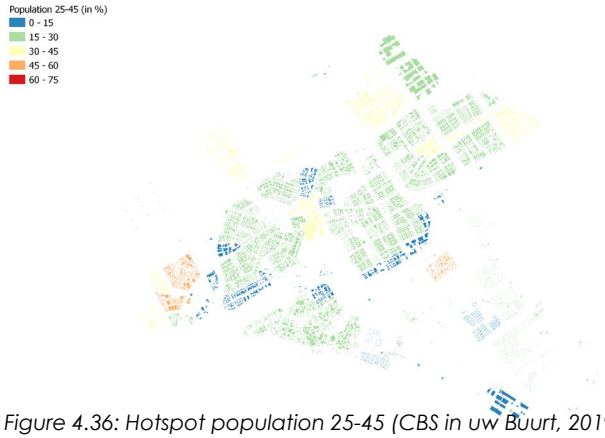


Figure 4.36: Hotspot population 25-45 (CBS in uw Buurt, 2019)

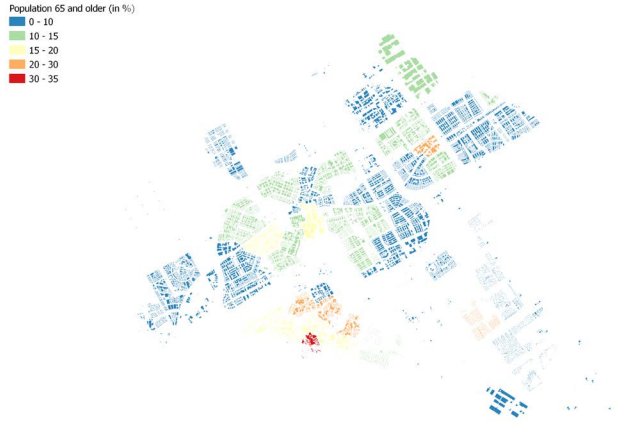


Figure 4.37: Hotspot population 65 and older (CBS in uw Buurt, 2019)

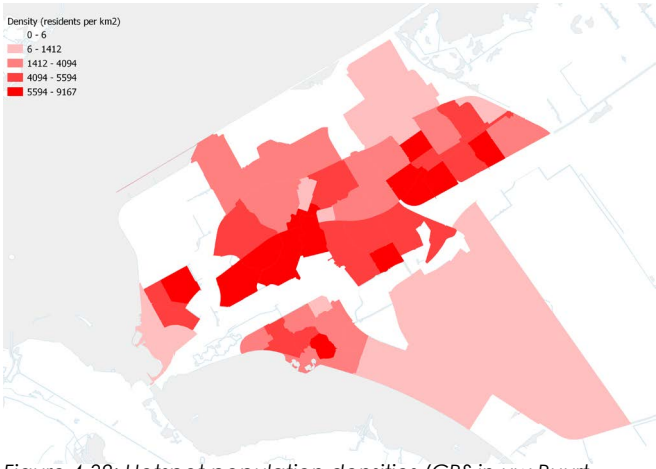


Figure 4.38: Hotspot population densities (CBS in uw Buurt, 2019)

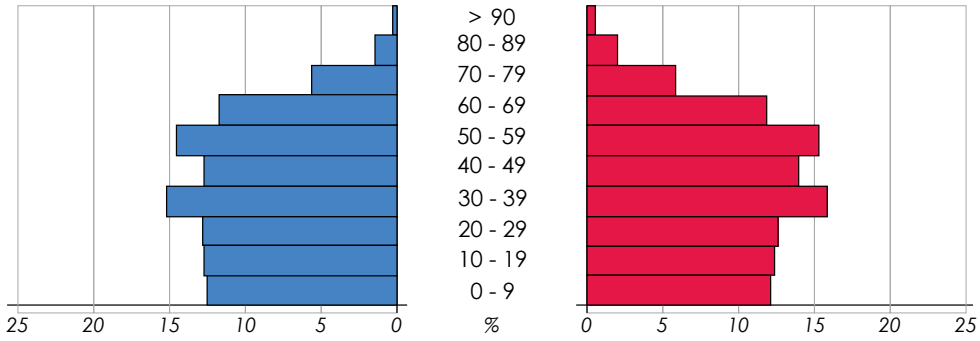


Figure 4.39: Population spread of Almere (Allecijfers, 2023)

Almere faces the same challenge of coping with a decrease in household size, like the Netherlands. The trend of one-person households is growing and the amount is doubled in the last two centuries. the concentration of one-person households can be identified in the urban centers. This is due to the housing stock in these areas. A large amount of apartments are located near the urban centers and these dwelling types are more focused on smaller household sizes.

The amount of refugees and immigrants in the Netherlands is rising, also in Almere. Various challenges are brought to the urban environment by this group of people. Spatial and social segregation, spatial and social injustice and low expectations of public amenities are challenges that need attention from designers (Jacobs, 1961). Therefore it is important to provide a healthy mix of people with different backgrounds (Talen, 2008; Rosol, 2015). This is also a key component of the strategy by the municipality (Gemeente Almere, 2021). The way non-western immigrants are dispersed at the moment is positive. Higher amounts of non-western immigrants are concentrated only near the urban centers of Almere-Stad and Almere-Poort. This is, like the one-person household spread, due to the different types of dwellings.

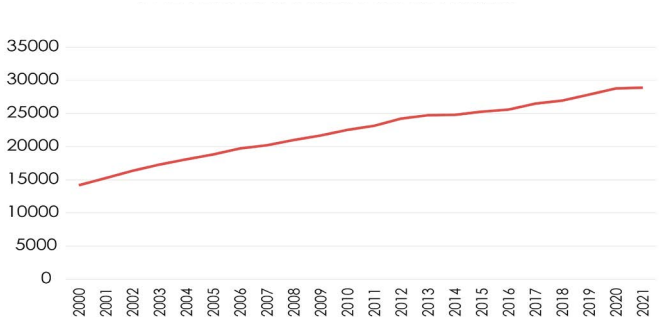


Figure 4.40: Amount of one-person households in Almere (Centraal Bureau voor de Statistiek, 2021)

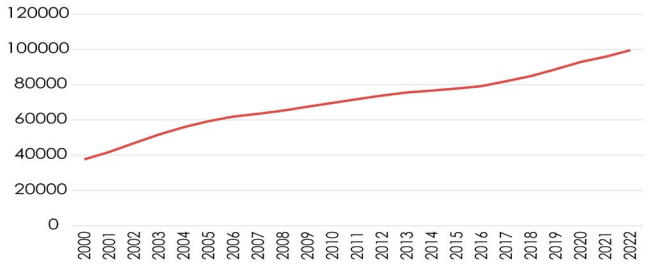


Figure 4.41: Amount of mmigrants keeps rising in Almere (Centraal Bureau voor de Statistiek, 2021)

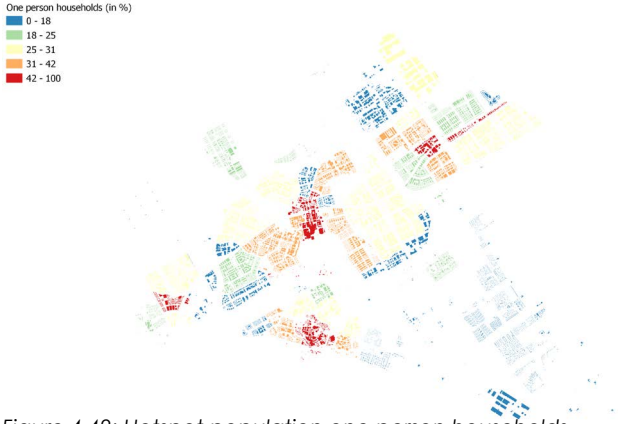


Figure 4.42: Hotspot population one person households (CBS in uw Buurt, 2021)

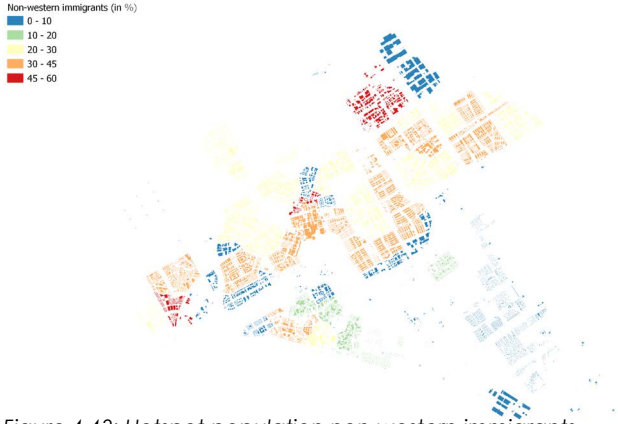


Figure 4.43: Hotspot population non-western immigrants (CBS in uw Buurt, 2021)

Commuting

Nevertheless, the combination of demography and urban environment means the 'suburban lifestyle' could develop in rapid pace in this city (Nio, 2007; Reijndorp, 2007). This suburban lifestyle, in general, causes a lot of car use. Almere is no exception for this and even strengthens this statement. Reijendorp (2012) talks about the 'unsustainable' way of life of residents in suburban neighbourhoods. He identifies that they live in low density neighbourhoods in single-family homes, have a minimum of 2 cars at their disposal, not only use for transit to work but also for the most "potty" things. He also writes in the contrary to that. City dwellers do have more proximity. They bring their children to school by walking. They commute by cycling to get to their work. When they recreate, they use public transport. Hinting on the impact of the urban environment in the way people commute.

The primary mode of transportation both inside the city and while leaving the city, to other cities for example, in Almere is by car (figure 4.45). This makes Almere one of the municipalities with the most commuting distance in the Netherlands (figure 4.44). People who live in Almere commute, on average, a distance of more than 35 kilometres. Research determining where the working population of Almere commutes to point out that the majority move to the Metropolitan Region of Amterdam. In contrast, the most amount of people commuting towards Almere originate from Lelystad. However, the majority of the working population—about 39.000—live and work in Almere. Approximately 51.000 jobs are available in Almere overall, compared to 63.000 commuters who leave the city to work in a different city. According to Berg et al. governors and designers are, and were, aware of this imbalance in commuting (2007). It is therefore important to add amenities and office spaces in the city to tackle this challenge.

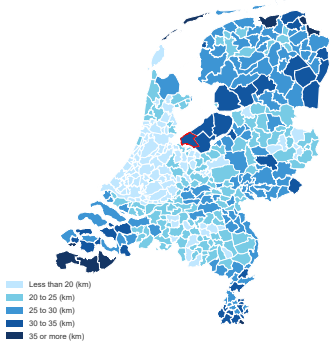


Figure 4.44: Distance of commuting per municipality (Centraal Bureau voor de Statistiek. 2018b)

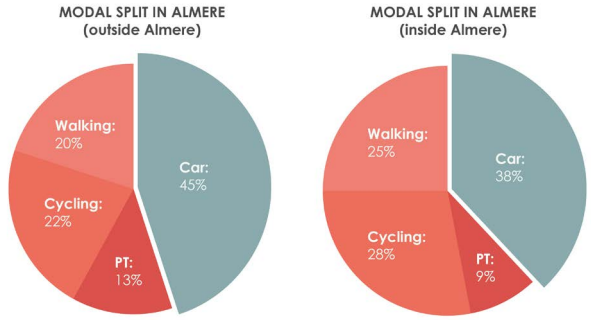


Figure 4.45: Modal Split of mobility used inside and towards outside Almere (Gemeente Almere, 2020)

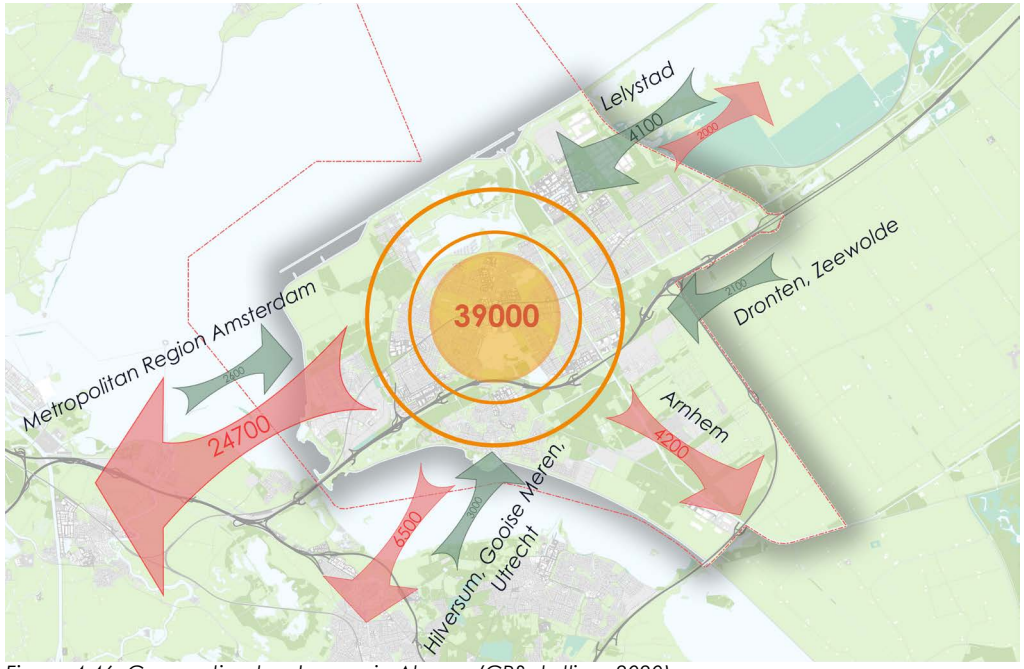


Figure 4.46: Commuting landscape in Almere (CBS statline, 2020)

Determining Lifestyles

According to Ageev & Ageeva (2015), lifestyle is the type of social relations specific to historical- and living conditions and forms of individual or group activities. Lifestyle is manifested in elements of relationships, behaviour and thinking in different situations. Urban lifestyle, meanwhile, is a set of individual and group forms of life activities that are implemented in cities and are often contrasted with the rural lifestyle (Ageev & Ageeva, 2015). The question if the urban environment has an impact on the type of lifestyles in cities is still debatable. However, the suburban lifestyle is formed when there is a collective organisation of private lives (Mumford, 1938). It is also a matter of watching and being watched and adapting a lifestyle is done by mirroring and getting ideas (Reijndorp, 2007).

Lifestyle research is often used in urban development to identify the wishes of the future population. Lifestyles can be defined as 'a consistent set of preferences (attitudes) and behaviour on habitats such as work, family, consumption, leisure and living' (Pinkster & Van Kempen, 2002, p. 45).

Ouwehand et al. (2011) conducted research in identifying how various lifestyle methodologies are used in practise and how valid and reliable they are. They identify four models that are frequently used to understand lifestyles in the public domain. The BSR-model by SmartAgent Company, the Mentality-model by Motivaction, the Mosiac-model by Experian and the WIN-model by TNS-NIPO. Only one of these four models, the BSR-model, links lifestyle typologies to spatial typologies. This model, which consists of four quadrants of experiential worlds (in Dutch: beleefwerelden), has been further elaborated into the 'desired ways of living together', called community concepts (Ouwehand et al., 2011). The experiential worlds and community concepts are linked together by socio-economic and socio-demographic characteristics. In this model, the different living environments, discussed in the previous subchapter, can also be projected.

According to Ouwehand et al., the model is a 'psychographic segmentation model that orders the underlying value, needs and motives of people within a certain domain' (2011, p. 17). In other words, how oneself is experiencing the world. The model is divided into four quadrants by two axes. The sociological axis is located on the horizontal. This axis shows how individuals relate to a group or community. To show if they are ego oriented or group oriented. The psychological axis is represented on the vertical. This axis depicts if the individuals are more turned to the outside or to their inside.

From extravert to introvert. People who identify in the yellow group 'Harmony', often are more open to others and seek harmony in their lives.

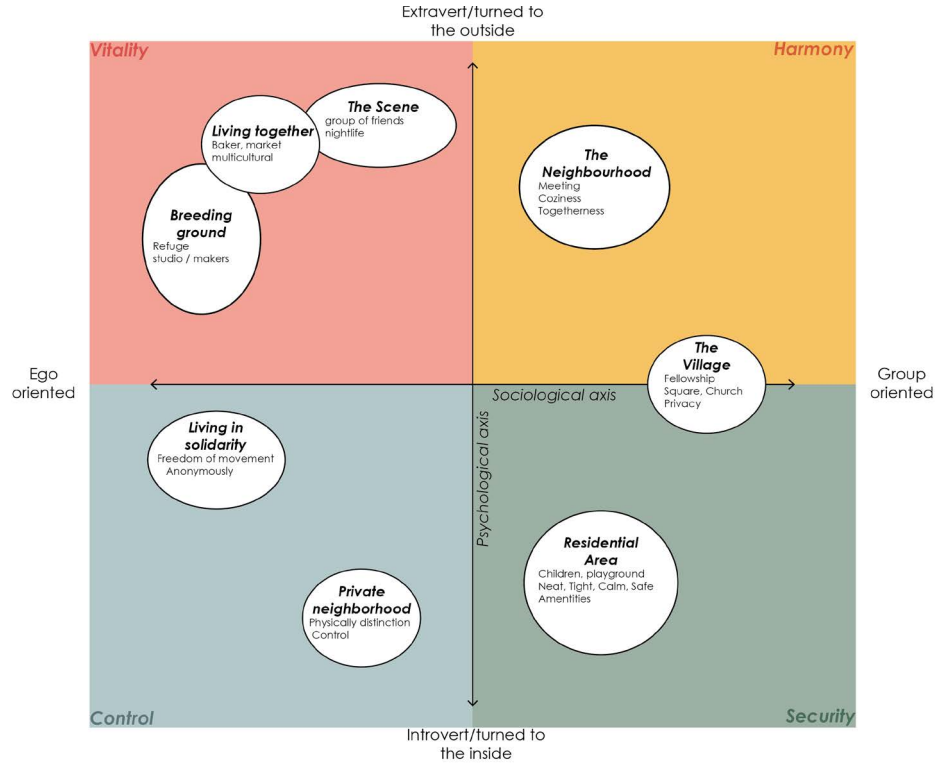


Figure 4.47: Placement of community concepts in BSR-model (Ouwehand et al., 2011, p. 24; modified by author)

The community, in general, and how to deal with common problems are important values. The green group 'Security', are also group oriented. However, this is more focused in being part of a clan. 'Stronger together' is the motto in this group and this is achieved together with counterparts. The blue group is focused on 'Control' and prefer being in control. Their own values are important to them and they often succeed in their careers. The final group is the red group. 'Vitality' is important to them and they often share a more progressive attitude towards exploiting oneself. Respondents never fall 100% in one quadrant. One or two quadrants is more often the case. The more dominant colour will then be assigned to the respondent. (Ouwehand et al., 2011)

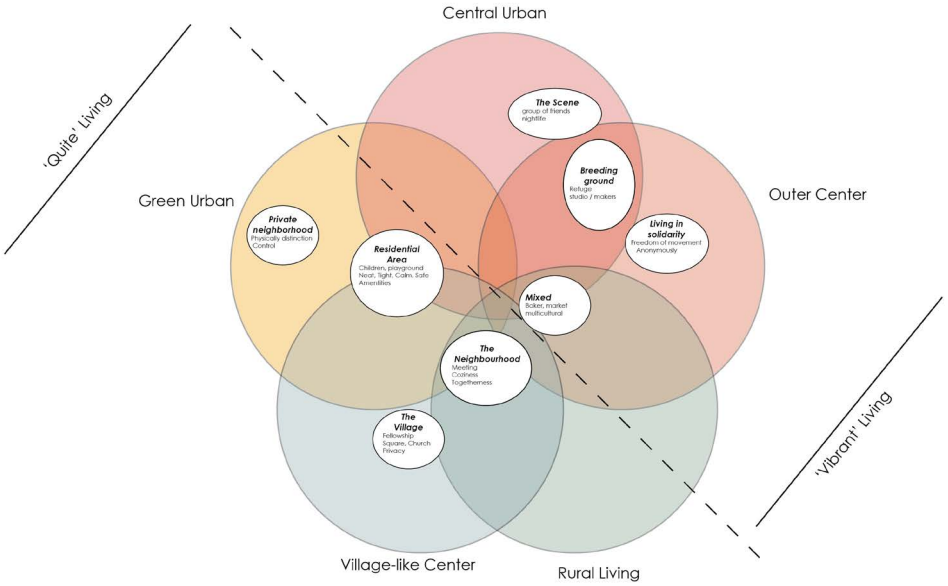


Figure 4.48: Placement of community concepts in living environments (Ouwehand et al., 2011, p. 24; De Vries et al, 2006, modified by author)

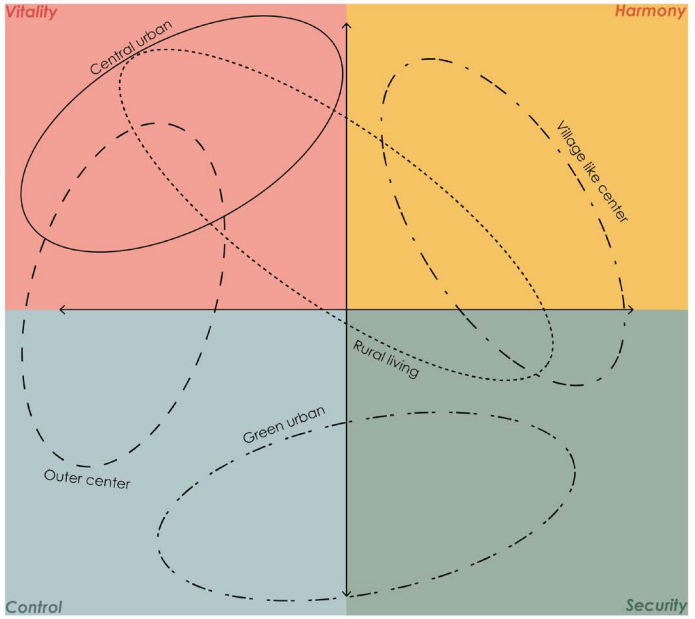


Figure 4.49: Placement of living environments in BSR-model (modified by author)

As mentioned, the BSR-model is the only model in the research done by Ouwehand et al. (2011) that connects lifestyles to the spatial domain. This is done by using so called community concepts, or place typologies. These place typologies tell something about the environment of living. In this way, it is possible to project the community concepts on the living environments identified by De Vries et al. (2006) In the last subchapter. This is done in figure 4.48. By doing this, a separation is identified between more 'quiet living' and more 'vibrant living'. With this information, it is possible to project the living environment on the BSR-model (figure 4.49).

Important for Almere is the fact that the Green Urban living environment corresponds to both green and blue quadrants. As stated in the previous subchapter, the majority of the urban environment of Almere consist of this living environment. This suggests the urban environment of Almere is designed for values aimed towards the lower part of the BSR-Model, the 'Control' or 'Securuity' quadrants. According to Reijndorp (2012), this is not the case for Almere. The conclusion of research done in Almere in an aim to better understand the current situation of lifestyles in Almere, suggest there is a lot of diversity in lifestyles in Almere. In contrast to what politicians and policymakers reckon (Motivaction, 2003).

MarketResponse identified that people who fall within different quantrants can differ quite a lot. Within the different quadrants there is a large diversity. For this reason MarketResponse enhances the model with seven lifestyles that can be projected on the BSR-Model. By looking at the lifestyles in this way, it is clear to see which groups are more closely related to each other. For instance, the Pleasure Seekers and the Adventure Seekers are both extrovert (Market-Responds, 2023). Both the Connection Seekers and the Harmony Seekers are oriented towards groups (MarketResponds, 2023). By looking at the position of the lifestyle in the model it is also possible to get an idea of the shared values of people with this lifestyle.

MarketResponds gathered information, in collaboration with provinces and municipalities and projected these seven lifestyles onto Dutch cities, including Almere. The map shows the dominant lifestyles of households on a (lower)neighbourhood scale. This scale is lower than the neighbourhood scale by CBS. This is done to get a better image of the dispersion of lifestyles. The data on the (higher) neighbourhood scale (Appendix 1), which corresponds to the neighbourhood scale of CBS, shows quite an even distribution of lifestyles throughout the neighbourhoods, the difference only being a few percentages (MarketResponds, 2023). This suggest and forms the statement that the living environment, embodied in the urban environment, does not correctly represent and serve the current lifestyles in Almere. The data suggests a diversity of lifestyles in the urban environment of Almere. However, the design of the urban environment, identified in the previous subchapter, aimes towards the lifestyles of Rest- en Style Seekers, which are connected to the bottom two quadrants of the BSR-Model and these lifestyles are more common in and focused on the Green Urban living environment, as identified. In this way, people with other lifestyles than Rest- en Style Seekers have no opportunity to express themselfs in the current urban environment. They are forced to express a different lifestyle because the urban environment enforces this upon them.

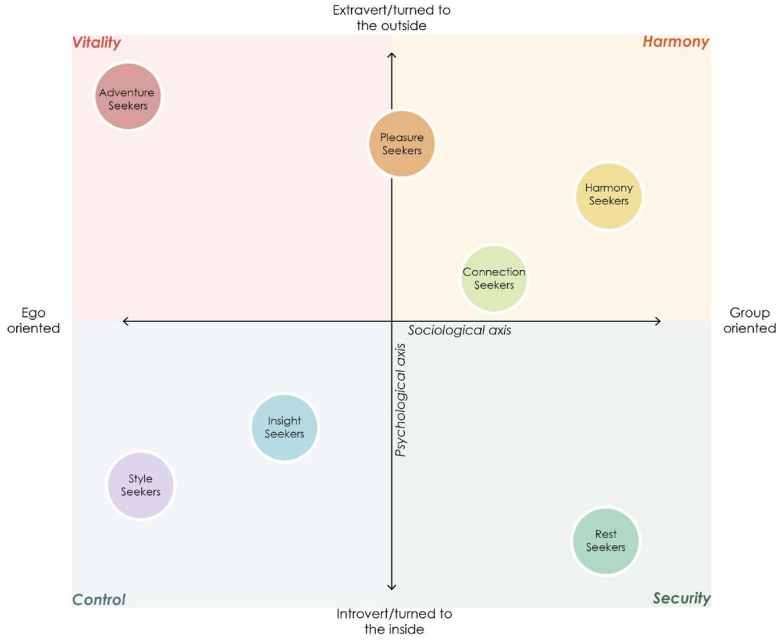


Figure 4.50: Placement of living environments in BSR-model (MarketResponse, 2023; modified by author)

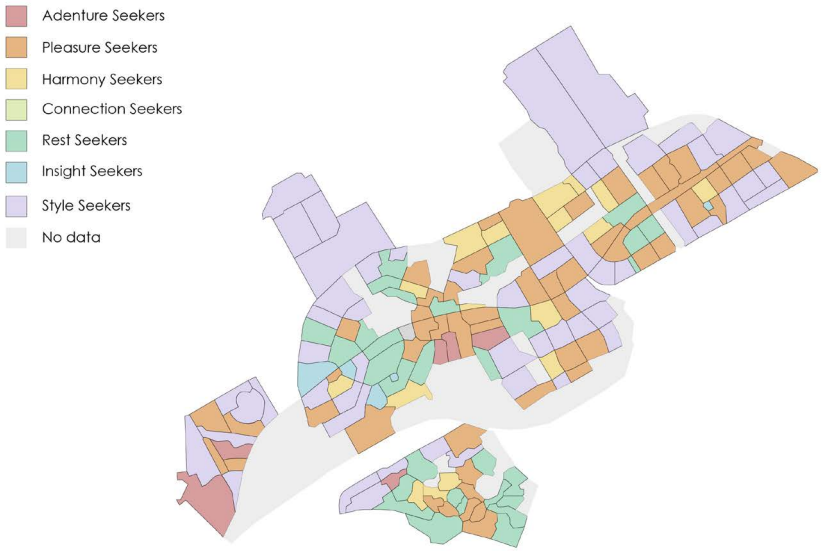


Figure 4.51: BSR-Lifestyles in Almere (MarketResponse, 2023; Modified by author)

SWOT-Analysis

Strenghts

Residential Quality

In combination with the green structure, a strength of Almere is the residential quality as part of the quality of the current living environment. There is a wide variety of urban forms. Also, the urban environment is suitable and offers great opportunities for densification.

Green Identity

Also the identity of Almere, being a green city connected to the surrounding landscape in the outskirts, is a strength which as to be further elaborated and strengthened.

Public Transport Dispersion

A benefit of the city is the dispersion of bus stops in the urban setting. A bus stop within the city is located in every 400 metres. Additionally, buses move on separate roads, providing greater comfort and decreasing travel time.

Opportunities

Changing Demographics

The changing demographics is an opportunity to enhance identity of Almere. This applies to a homogeneous housing stock. Different living environment should be implemented to enhance other lifestyles in the city, increasing diversity in the spatial, social and economic domain.

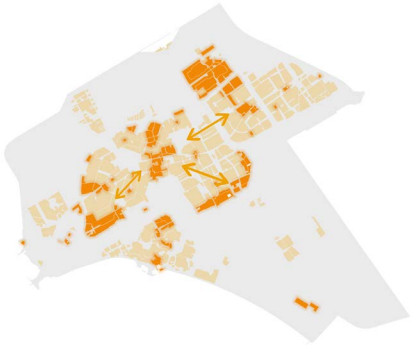
Underutilised Green

The green structure offers a lot of qualities in the urban environment. The research revealed that the green structure is frequently very monocultural. The green is therefore underutilised. This presents opportunities for improving the quality of the green space as well as revitalising the urban environment.

High-Quality Public Transport

A strength of Almere is the separate public transport infrastructure. However, these infrastructure are situated in the lee of the urban environment which makes them very segregated. They have the potential of implementing additional amenities as well as connecting amenities to High-Quality Public Transport

Weakness



Separation of Functions

The city is organised for the separation of functions. This is mainly due to the use of the Garden City concept in the design of the city. However, this increases proximity and distance between life, work and recreation.

Homogeneous Housing Stock

The homogeneous housing stock is a weakness of Almere. The housing stock offers less opportunities for one-person households and immigrant families. There is an extensive imbalance between the housing stock and households.

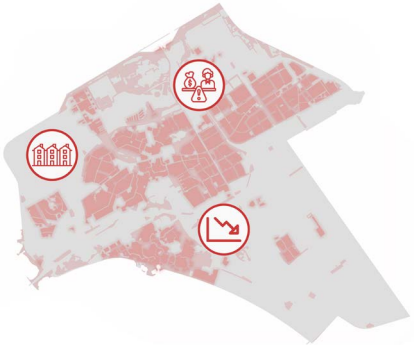
Imbalance in Commuting

The imbalance in commuting is the outcome of the dependency of Almere to Amsterdam. It ensures that there will be fewer economic opportunities in the city, which will worsen the employment climate.

Threats

Extensive Urban Sprawl

The chosen direction of Almere as a living city is the foundation of a very low density in population due to the extensive amount of single-family homes. The continued use of this direction in the future is a threat in the analysis. This direction uses an extensive amount of space in the landscape and causes urban sprawl, which in its turn increases distances between functions.



Losing qualities

Doubling the population and increasing the density via densification has an effect on the current urban environment. The primary threat that densification poses is the loss of qualities. The population moving to Almere also values the suburban life and the affordable housing. If densification is not properly implemented, it could undermine the values and foundations upon which Almere was built.

Unsuitable Housing Stock

Future demographics will change, necessitating a more diverse housing stock and urban environment. The threat of not adjusting to this is significant.
In ultimately, this will lead to a housing stock that is unfit for the diverse population, creating a variety of problems.

Conclusion

To conclude, the demography of Almere is changing, like the demography of the entire country. This presents several challenges and requires a new vision on the urban environment of Almere. Because people are choosing to live alone more frequently, households are becoming smaller. The aging population is likely a contributing factor in this as well. Also, Almere is home to a variety of people with different backgrounds, increasing the possibility of social segregation. Consequently, the monotonous and homogeneous housing stock of Almere is a weakness and can play a significant role in tackling these challenges (Oosterhoff et al., 2012).
The separation of functions and low density of housing is also a weakness of the city, also according to the municipality (Gemeente Almere, 2021). This is due to the modernist ideals Almere was founded on (Oosterhoff et al., 2012). In this situation, the persistence of urban sprawl in future visions of the city poses a threat. The regional position of the city has an impact on the lifestyles in the city. The imbalance in commuting (Oosterhoff et al., 2012) leads to an increase of car-use to other cities, particularly Amsterdam. As a weakness, Almere is designed as a flow-over city of Amsterdam and is commonly associated as a suburban area of Amsterdam (Oosterhoff et al., 2012; Gemeente Almere, 2021).
These suburban characteristics do, however, add to the strengths of the city. The qualities add variety to monotony. From open (Almere-Haven) to enclosed (Almere-Stad) to closed (Almere-Buiten), the order of the spaces is what matters here (Nio, 2007, p. 155). Additionally, there is a lot of green space, which adds to Almere's identity as a green city (Gemeente Almere, 2021). But there are still a lot of unutilised, monocultural green spaces. The distribution of bus stops throughout the city was a key element in the city's planning. Another advantage of the current city is the separation of the bus and car infrastructures. These present a significant opportunity to improve public transport and build an effective, high-quality public transport system to reduce car-use.
In addition to this, the urban environment of Almere is aimed towards specific people with a specific lifestyle. However, Almere knows a diversity in lifestyles. because of this, people are forced to have a different lifestyle than they prefer and are unable to express their lifestyle. Ths means, a more diverse urban environment aimed to these people.

Figure 3.57: On top of the IJmeerdijk looking into the direction of Amsterdam (By author)

5.

THE DESIGN TOOLS

Urban Retrofitting and Renewal

The field of Urbanism has many conceptions considering the upgrade of the current urban environment. The more frequent used ones are renewal, retrofitting, regeneration, redevelopment, and revitalisation. This thesis will use the word 'retrofitting' and 'Renewal'. Retrofitting is a combination of "retroactivity" and "fitting" and was applied for the first time to implement architectural solutions of the time that had to be adapted to new urban requirements (Ramos, 2021). Most importantly, the term is also use by Dunham-Jones & Williamson (2011) for the title of their book 'Retrofitting Suburbia'. It is for this reason this term will be used throughout the entire thesis. This term refers to making the least amount of effort to stay within the Row House Paradigm and the structure of the neighbourhood. Urban Renewal is necessary to counter the urgencies necessary which go beyond the Row House Paradigm. A renewal of the urban environment is necessary in this case, which manifests as a new neighbourhood structure and a new role in the city structure.
Von Meding et al. (2020) concludes that a third generation of 'Wijkvernieuwing' (neighbourhood Renewal 3.0) is necessary in order to regenerate and re-evaluate our suburban neighbourhoods. Constructing dwellings, to adress the challenges, shouldn't be a goal by itself. Constructing dwellings should enhance and revitalise our urban environment as a whole (van den Boomen et al., 2022). This shows that urban retrofitting and renewal is much more than only adding dwellings to a neighbourhood. The urban environment resembles a puzzle with different pieces that fit together to create a whole. It is essential to understand that if one puzzle piece is modified, the others will be affected and will need to be changed as well in order for the puzzle to come back together again. Finally, these alterations and suggestions will be coherent with the concepts of New Urbanism and Smart Growth.

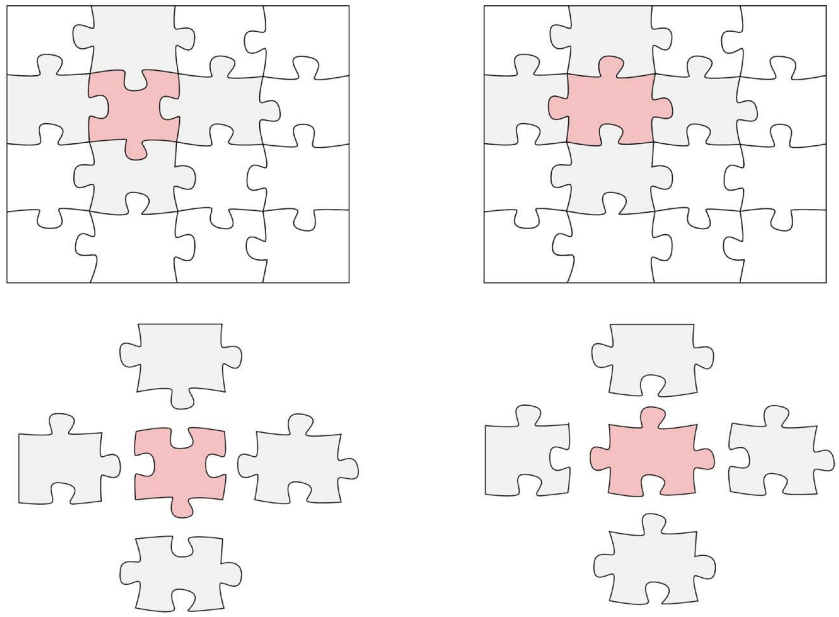


Figure 5.1: One piece of the puzze changes, parts of the puzzle need to be adjusted as well (by author)

Figure 5.2: Hoornes in Katwijk-Noord, Netherlands by Dunavie (Von Meding et al., 2020)

Figure 5.3: Parkstad, Rotterdam by DELVA Architects (Delva, 2019)

Reference Projects

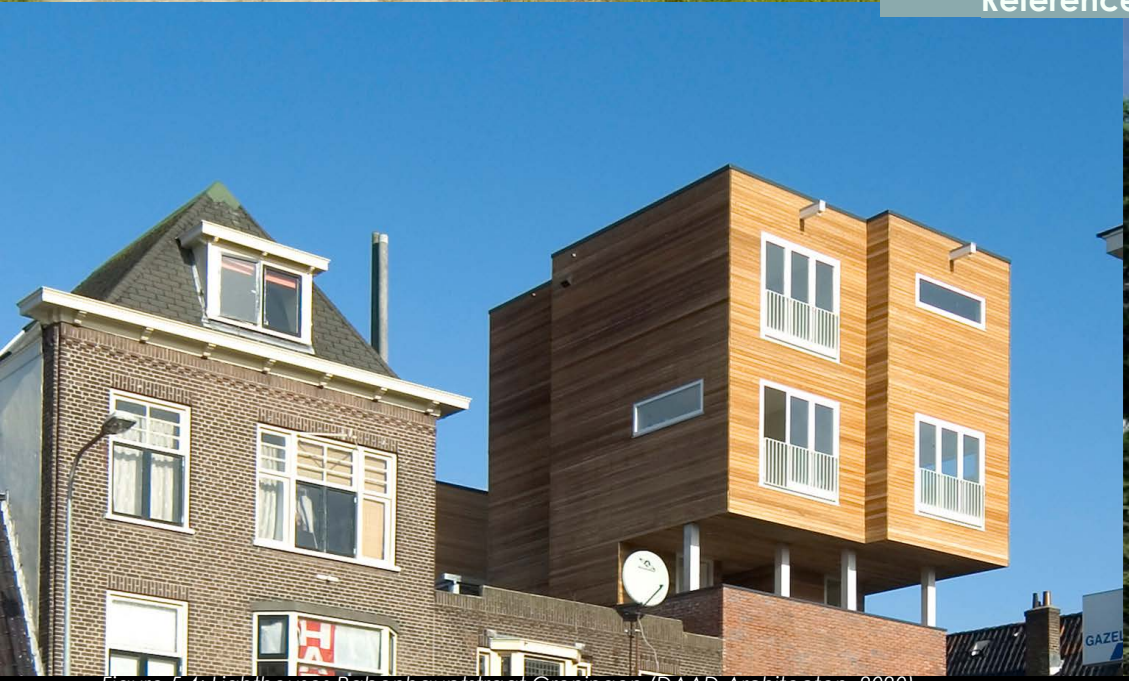


Figure 5.4: Lighthouses Rabenhauptstraat Groningen (DAAD Architecten, 2020)

Figure 5.5: Retrofitted apartment building by Symbiotic Urban Movement (TU Delft, 2022)

Figure 5.6: Hof van Cartesius by RAHW Architecten (2018)

Figure 5.7: Triodos Bank Headquarters by RAU Architecten (2019)

Figure 5.8: Wilgenhof in Dordrecht (KAS architectuur & stedenbouw, 2021)

Figure 5.9: De Karel Doorman in Rotterdam (Van Tilburg, n.d.)

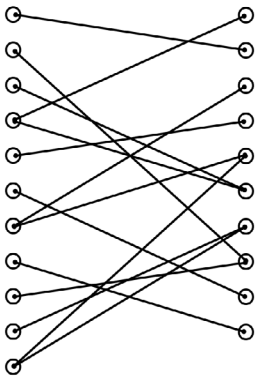
New Urbanism & Smart Growth

The New Urbanism and Smart Growth principles will be the foundation of the different choices made in the implementation of the design tools in the neighbourhoods. Bohl defines New Urbanism as "a movement in architecture and planning that advocates design-based strategies based on 'traditional' urban forms to help arrest suburban sprawl and inner city decline and to build and rebuild neighbourhoods, towns and cities" (2000, p. 762). The movement aims for a sustainable way of revitalising neighbourhoods. Eleven principles are defined by the New Urbanism movement. Walkability; connectivity; mixed use and diversity; mixed housing; quality architecture and design; traditional neighbourhood structure; transect planning; increased density; smart transportation; sustainability; and quality of life (Nghiningwa, 2019). Smart Growth is a different but very similar movement.

This movement aims towards ten principles, create a range of housing opportunities and choices; create walkable neighbourhoods; Encourage community and stakeholder collaboration; foster distinctive attractive places with a strong sense of place; make development decisions predictable, fair, and cost-effective; mix land uses; preserve open space, farmland, natural beauty, and critical environmental areas; provide a variety of transportation choices; strengthen and direct development towards existing communities and; take advantage of compact building design (Knaap & Talen, 2005). New Urbanism and Smart Growth can be seen as synonyms, but there are differences. New Urbanism is an umbrella term and originates more from architects and physical planners (Knaap & Talen, 2005). The two movements and their principles form the basis for further design for housing, amenities and public space.

New Urbanism

Walkability
Connectivity
Mixed use and diversity
Mixed housing
Quality architecture and design
Traditional neighbourhood structure
Transect planning
Increased density
Smart transportation
Sustainability
Quality of life



Smart Growth

Create a range of housing opportunities and choices
Create walkable neighbourhoods
Encourage community and stakeholder collaboration
Foster distinctive attractive places with a strong sense of place
Make development decisions predictable, fair, and cost-effective
Mix land uses
Preserve open space, farmland, natural beauty, and critical environmental areas
Provide a variety of transportation choices
Strengthen and direct development towards existing communities
Take advantage of compact building design

Diversity in Housing

There are numerous approaches that can be found to diversify a housing stock. Talen (2008) identifies three ways. Firstly, a mix of housing types. This can vary from apartments or row homes, often expressed size and, less often, architectural form. Secondly, the variety in ages of the buildings. This is more expressed in the architectural form. Thirdly, to create an economic mix of housing types. This should be done in order to create a mix from cheaper to more expensive housing. These approaches can be used in addition to one another in order to create a more diverse housing stock.

Spitting, Expanding and Topping up
The research done in this thesis aims to enhance circularity. Therefore, it is necessary to identify how the existing urban environment and building blocks can facilitate additional dwellings. Von Meding et al. (2020) identify various ways a row house could facilitate different housing types. For example, two row houses have the ability to be split with the opportunity to create three or more dwellings that can vary in size. In their publication 'Beter Benutten Bestaande Woningbouw' (Better Use of Existing Housing) by Platform31, Van Klaveren et al. (2021) conducted extensive research in the possibilities of splitting and sharing dwellings. They identify different ways to densify the existing urban environment. They call this; making more intensive use of existing housing (Van Klaveren et al., 2021). They achieve this by facilitating the possibility of adding more people in one house (sharing) and adding more dwellings on a plot of land (splitting). Interestingly, this could be done in various stages and phases, which makes it a very adaptable and futureproof approach. There are five possible ways to accommodate more people in a single home, so called 'sharing' a home.
1) Living together. They frequently share a rental agreement, which means both are owners of the dwelling. They are in a relationship, and represent -financially- one household.
2) To live in. In this case, one or more rooms will be rented while the owner continues to live in the residence.
3) To sublet. The property's owner sublets his home to a tenant. The owner and tenant will not share a residence.
4) A friends agreement. This is similar to living together, but the people are not intimately connected. They do only represent one household.
5) There are various tenants for various rooms. The home owner does not occupy the property.

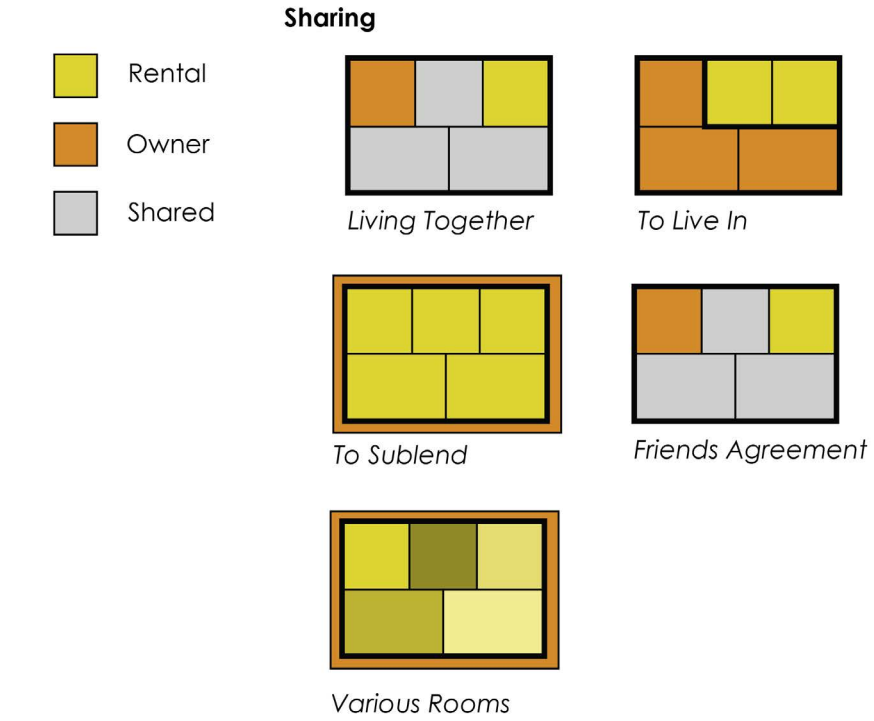


Figure 5.10: Forms of Sharing

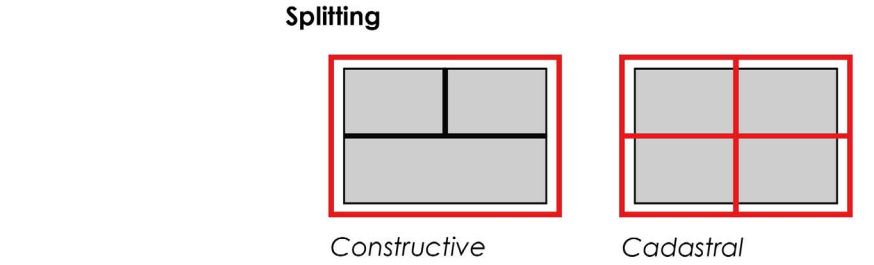


Figure 5.11: Forms of Splitting

All of these fall within the parameters of sharing a home with other residents.
According to Van Klaveren et al. (2021) this approach fits in the technical splitting of dwellings, the more softer approach. Which means only a view construction adjustments have to be done in order to complete this.
Splitting homes is a harder and intensive approach. According to Van Klaveren et al. (2021) this splitting is done by implementing it in the register of ownerships (Kadaster). In this way the structure of one dwelling is used to create several dwellings. The addition of a new or additional front door strengthens this.
This splitting could be enhanced by adding volumes to the existing building block. They identify that there is often enough space in front and at the back at the house to expanded the building. The same could be achieved by topping up. Creating more space vertically to add dwellings.
In this way, even more dwellings could emerge from the splitting of these row houses (Von Meding et al, 2020). The publication by Platform31 suggest the same, they call this adding dwellings on an existing lot (Van Klaveren et al., 2021).
As a result, more "desirable dwellings" can be created. According to Von Meding et al. (2020), this could be linked to efforts to diversify the population living in these kinds of dwellings. homes with ground-based life-course resistance are meant by these desirable dwellings. This has the potential to encourage neighbourhood circulation. Additionally, BureauVanEig (2022) conducted research on similar interventions. They conclude that adding more than one of these interventions together has the opportunity to improve the result.

Ownerships
This also implies a variety of ownerships and ownership changes. Row houses are frequently examples of owner-occupied homes. As mentioned in chapter two, one of a row house's attractive qualities. This is a form of individual ownership (Garber, 2022). The tools require the transition from individual ownership to common ownership. This ownership is often found in apartment buildings. Each tenant is the owner of their own part of the property and is able to sell this (Garber, 2022). A financial or economic benefit must be provided to the current owner of the dwelling or plot of land for the transition from individual ownership to common ownership.

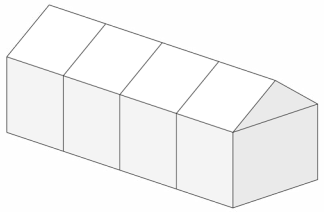


Figure 5.12: Exisitng situation (By author)

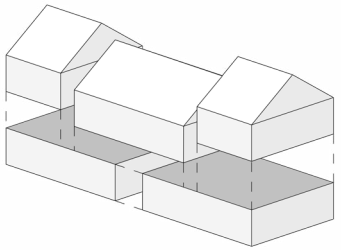


Figure 5.13: to split (By author)

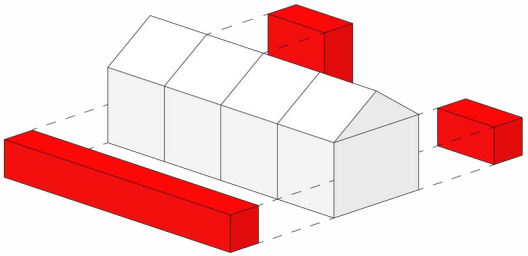


Figure 5.14: to expand (By author)

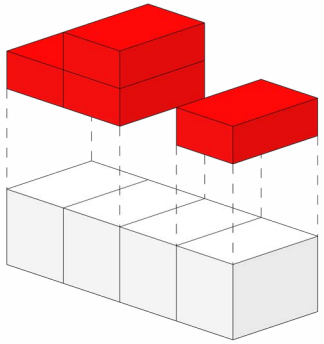


Figure 5.15: to top up (By author)

Precision Intervention
This intervention discovers 'left-over' spaces in a neighbourhood where new volumes and consequently new dwellings could be added. This was briefly covered in the previous subchapter. Von Meding et al. (2020) approach this method on a larger scale, the neighbourhood scale. The majority of these spaces are parking lots. In low-rise post-war neighbourhoods, designed for car-use, the amount of parking lots is extensive (BureauVanEig, 2022). Von Meding et al. (2020) conclude that future developments in mobility have the opportunity to reduce car-use, this also applied to how we design our neighbourhoods. This implies that amenities for cars in neighbourhoods will require less space in future. Left-over spaces are also highlighted in what Von Meding et al. (2020) refer to as 'blind corners'. These are unutilised spaces between two corner blocks. It is possible to add new volumes in the corners of these two blocks, emphasising the possibility of adding dwellings in these spaces.

Neighbourhood edges
Also according to von Meding et al (2020), post-war neighbourhoods have a moderate quality in their fringes and edges. These are often transition zones between roads, parks, rural or areas with a different function. These spaces bring a lot of potential to densification and adding dwellings. Additionally, a shift in perspective regarding the importance of these spaces has the potential to create more space in the city. The amount of space required for these functions can be reduced by improving the connections and networks for the road infrastructure on a city scale. The combination of these suburban neighbourhood interventions results in a better and more effective use of urban space.

Restructuring
The more obvious intervention could be the restructuring of the neighbourhoods where buildings, not fit for use, can be demolished and replaced. Often these interventions will be necessary to add more than just dwellings. The need for amenities and a more efficient use of greenery, like climate adaptive measures and biodiversity, can be more easily achieved with this intervention.

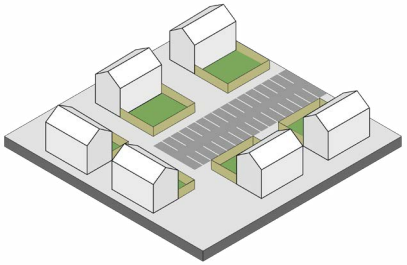


Figure 5.16: Abstract view current situation (By author)

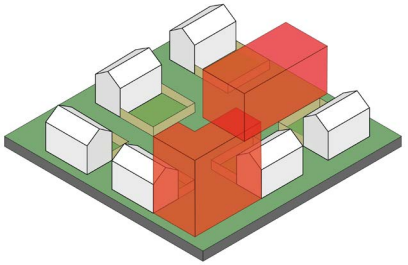


Figure 5.17: Abstract view precision intervention (By author)

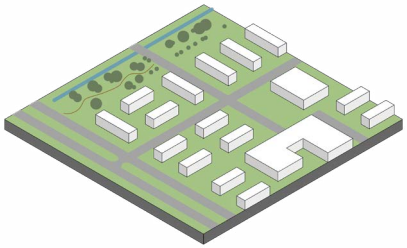


Figure 5.18: Abstract view current situation (By author)

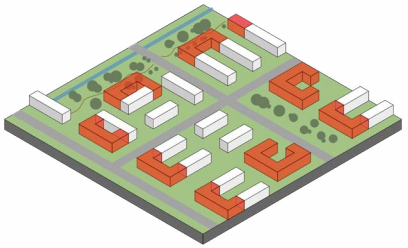


Figure 5.19: Abstract view intervention in fringes (By author)

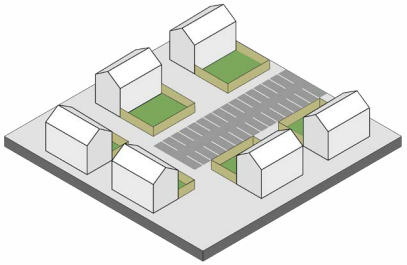


Figure 5.20: Abstract view current situation (By author)

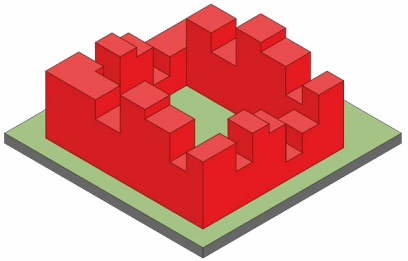


Figure 5.21: Abstract view restructering (By author)

Diversity in Amentities

As stated, the goal of the thesis is to create more compact and mix-use spaces in cities. According to Hoppenbrouwer & Louw (2005), the concentration and diversity of activities lead to social, economic and environmental benefits. New Urbanism argues that mixing uses avoids sprawl (Grant, 2008). In this subchapter the research will focus on how and what type of amenities and activities can be added in suburban neighbourhoods. The composition of the mix matters. Uses should complement each other and be active at different times of the day, creating what Jane Jacobs called "complex pools of use" (Talen, 2008). This is one of three conceptual levels Hoppenbrouwer & Louw (2005) introduce to create diversity, increasing diversity of uses, like housing, work and recreation. The second level is increasing intensity of land, creating more density of functions, housing and amenities. And integrating segregated uses. Which is about overcoming environmental impacts.

Unnecessary use of industrial areas
A different approach is mentioned by the Provincie Zuid-Holland (n.d.). The ability to move businesses from industrial areas and business parks to the city to increase mix use. This are of course clean enterprises, businesses without the threat of pollution and the ability to be moved to the city. As Provincie Zuid-Holland write: "we now find all kinds of companies on industrial areas with limited environmental nuisance" (n.d., p. 9). Since services make up the majority of the economy, many businesses do not even need to be located in a business park or industrial area. As a result, the separation of functions becomes less logical because of the unnecessary use of space on industrial areas and business parks. This expands the available industrial space and makes more efficient use of available space across the city.
However, this will give industrial areas the possibility to accommodate larger, more polluting industries. which has both advantages and disadvantages.

Across different dimensions
Hoppenbrouwer & Louw (2005) also identify different dimensions in which mix-use can be implemented across different spatial scales. Shared premises, the horizontal dimension, the vertical dimension, and the time dimension, which is very interesting. They represent mixed-use at a specific location, on a flat surface, vertically categorised, and in a particular order in time (Hoppenbrouwer & Louw, 2005).

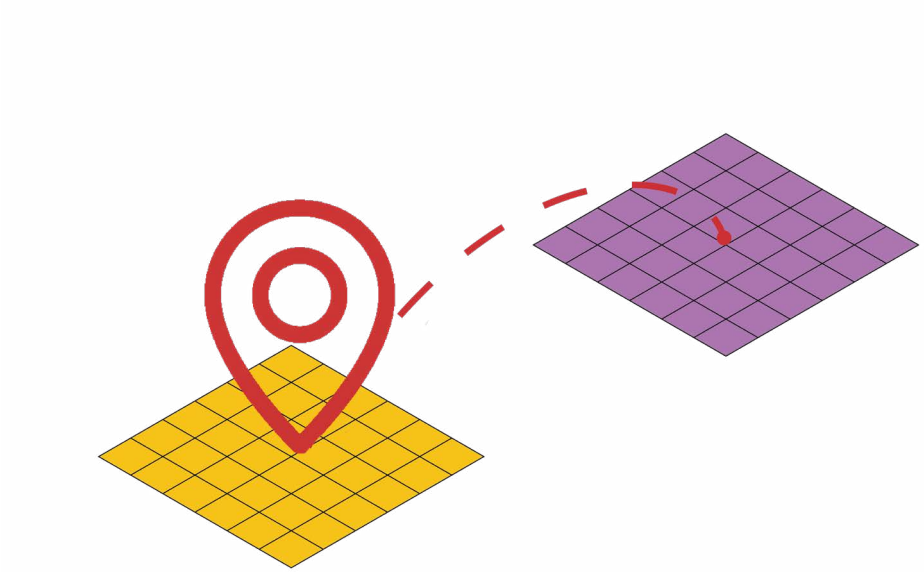


Figure 5.22: Relocating amenities

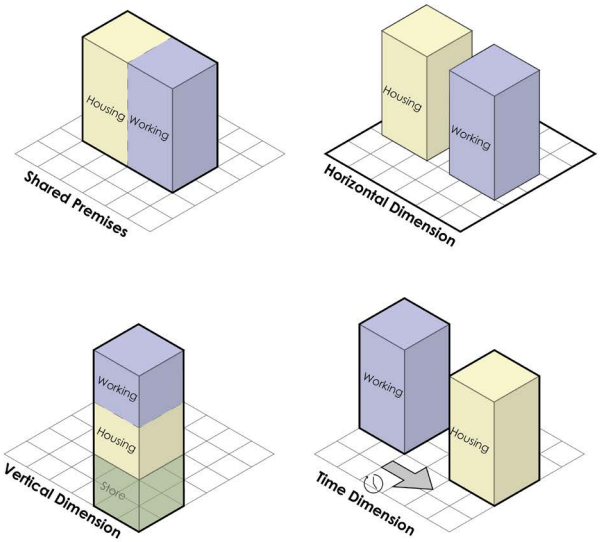


Figure 5.23: Mix-use across domains

Small Scale amenities
According to Talen (2008), it is important to identify the difference between the size and impact of amenities.
Small scale amenities can have a big influence on the perception and use of the urban environment. Duany et al. state: "*While it is only a start, a small corner store does wonders to limit automobile trips out of the development, and does more than a social club to build the bonds of community*" (2000).

Zoning
Not all functions and amenities can be combined. By dividing the urban plan into different zones, this problem can be solved. These areas are known as the 'quiet, commotion, and noise zones' (Dano, 2023).
By placing these zones strategically, the urban space can be organised more efficiently and correctly. Making the area more vibrant and liveable but also maintaining the calm feeling a suburban neighbourhood is known for.

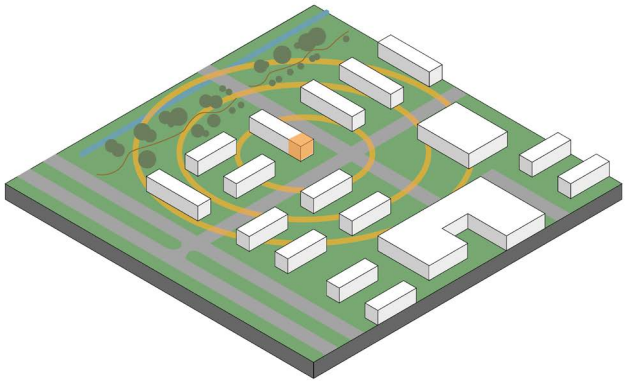


Figure 5.24: Small scale amenities have large impact (by author)

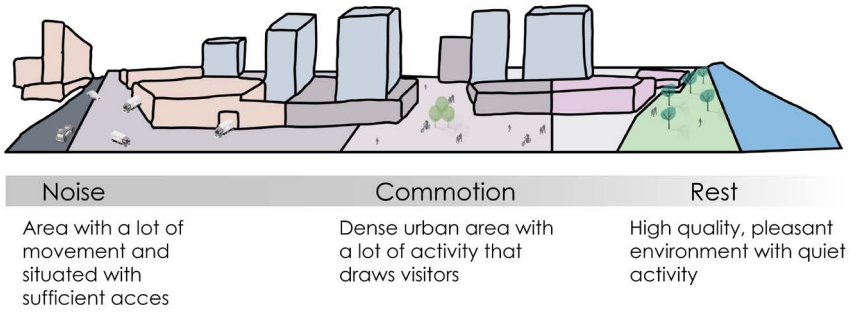


Figure 5.25: Zoning according to Dano (2023) (modified by author)

Diversity in Public Space

Quality vs. Quantity of green

A negative impact of adding housing, amenities, functions by adding volumes in existing neighbourhoods, is that this is often at the expense of green structures (Haaland & Konijnendijk, 2015). Green frequently improves liability of urban dwellers and increases biodiversity. Green also significantly reduces the negative effects of climate change on the city, which is a significant quality. It has the ability to reduce the urban heat island effect, collect rainwater during periods of heavy rain, and store it for periods of dry weather—all issues that are becoming more and more crucial in this era of climate change.

Haaland & Konijnendijk (2015) identify five suggestions for strategies on how to facilitate green space provision in densified urban environments.

First and foremost is of course to preserve green space as much as possible. However, this might not be possible for various reasons in a design.

Therefore, designers and planner need to pay more attention to the quality of green rather than quantity of green (Russo & Cirella, 2018).

Haaland & Konijnendijk (2015) also suggest the enhancement of the quality of existing green space, which is their second suggestion. This is important if no additional green space can be provided in the redeveloped urban environment. Therefore, to better understand this, it is important to investigate if there is a preference between quality and quantity of green space. Haaland & Konijnendijk (2015) hint on the importance of quality over quantity. According to Zhang et al. (2017), the perception of residents is that the quality of green, expressed in accessibility and usability, is much more important than the quantity. But also on the effect of biodiversity, the quality of green can be much higher on a small plot with a variety of vegetation rather than a large patch of monocultural green (Shaftoe, 2008). it is important not to see construction as the opposite of nature, but as a possibility to increase the quality of green and make less impact on nature. To adapt buildings to nature, not nature to buildings.

After this, providing green space on redeveloped sites is the next strategy to undertake. Haaland & Konijnendijk (2015) identify that during construction phases, green should also be preserved. This is still lacking in current redevelopments.

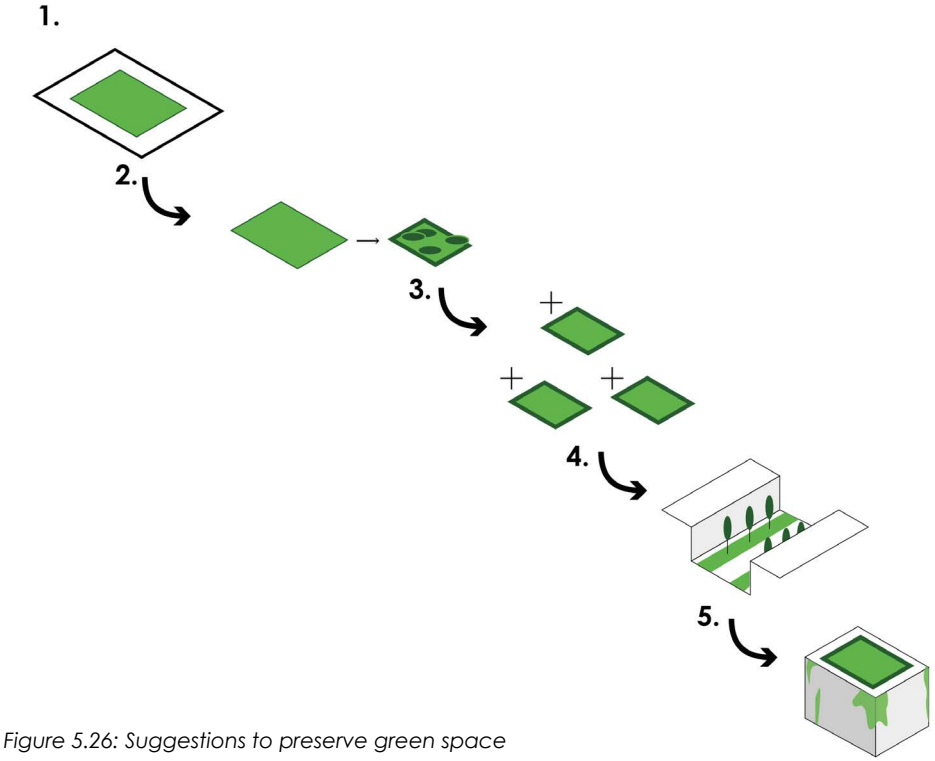


Figure 5.26: Suggestions to preserve green space

Greening difficult sites, such as narrow streets, which often lack green space, is the fourth important strategy. This is about rethinking mobility and making space for green more important than other functions necessary in the public space.

The final strategy is about smart allocation of green to increase visibility and visual quality of the urban environment. Haaland & Konijnendijk (2015) see Singapore as a reference for this. Green which grows on the side of buildings or yards in urban blocks on the smaller scale are examples for this.

Infrastructure
A major goal in identifying the limitations of the Row House Paradigm is to decrease ca-use, especially inside the city boundaries. Therefore, the focus of the infrastructure should change from car-oriented to bike- and pedestrian-oriented.

Re-ordering urban blocks
To adapt a neighbourhood to a larger scale and density, DELVA Landscape Architects and Urbanists have found ways to reorganise an urban block in (Delva, 2019). Implemented in the design of Parkstad in Rotterdam, the area inside the blocks has the potential to develop into a communal area. 'formal greenspaces', like parks, residential gardens and yards, may not be sufficient to meet the needs of the residents, especially in denser environments (Russo & Cirella, 2018). DELVA further suggests including (semi-)private gardens for houses and residents who still want their own gardens. This re-ordering of the urban block guarantees a neighbourhood where space is utilised in better and more efficient way.

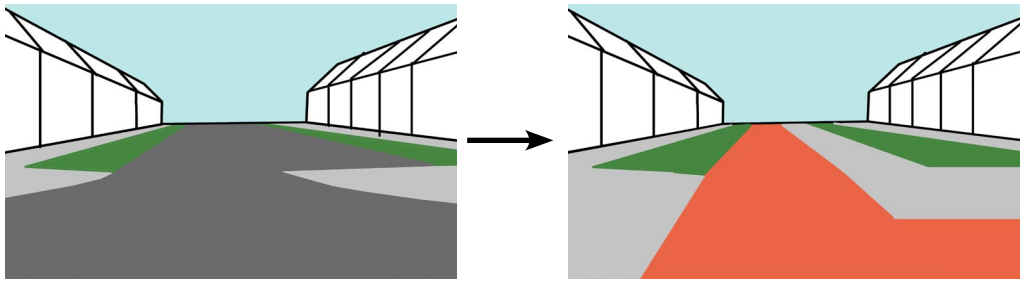


Figure 5.27: From Car-oriented to bike- and pedestrain-oriented

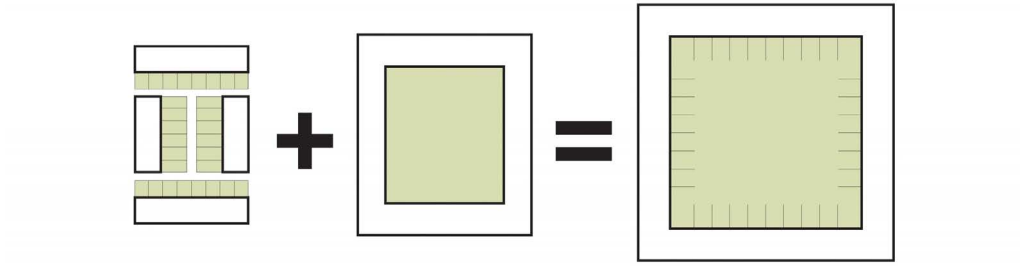


Figure 5.28: Abstract view re-ordering urban blocks (Delva, 2019)

6.

THE VISION

Design preconditions

The design strategy of Almere needs , in order to complete the research aim, several design preconditions to have a better understanding what to design for. As stated in chapter four; subchapter one, policymakers of the municipality of Almere aim for the scale jump (Oosterhoff et al, 2012). This scale jump aims for a population increase of 150.000-200.000 people and an addition of 60.000-100.000 dwellings by 2050 (Gemeente Almere, 2021). Bringing the total population towards 350.000-400.000 and making Almere the fifth city of the Netherlands by population.
Secondly, it is important to keep and enhance existing qualities of Almere. The Garden City concept, Almere was designed to, brought a variety of qualities. One of them being the use of extensive green structures (Nawijn, 1986). The green structures brought quiet places for residents in the form of 'mental areas' (Nawijn, 1986).

Residents experience a village-like character by living in green yet experience proximity of amenities (Gemeente Almere, 2021).
These qualities have to be secured. According to the municipality, the urban nature brings a lot of opportunities towards biodiversity and climate adaptive measures (Gemeente Almere, 2021). Therefore, an important precondition is to secure and enhance the green network of urban nature.
Thirdly, considered the timeframe and direction to designed towards. The design strategy needs to offer an alternative route towards the goal of becoming the fifth city of the Netherlands and needs to aim towards a larger timeframe, for example the year 2100, and suggest further steps in remaining the fifth city of the Netherlands in a sustainable way. This is something more research need to point out

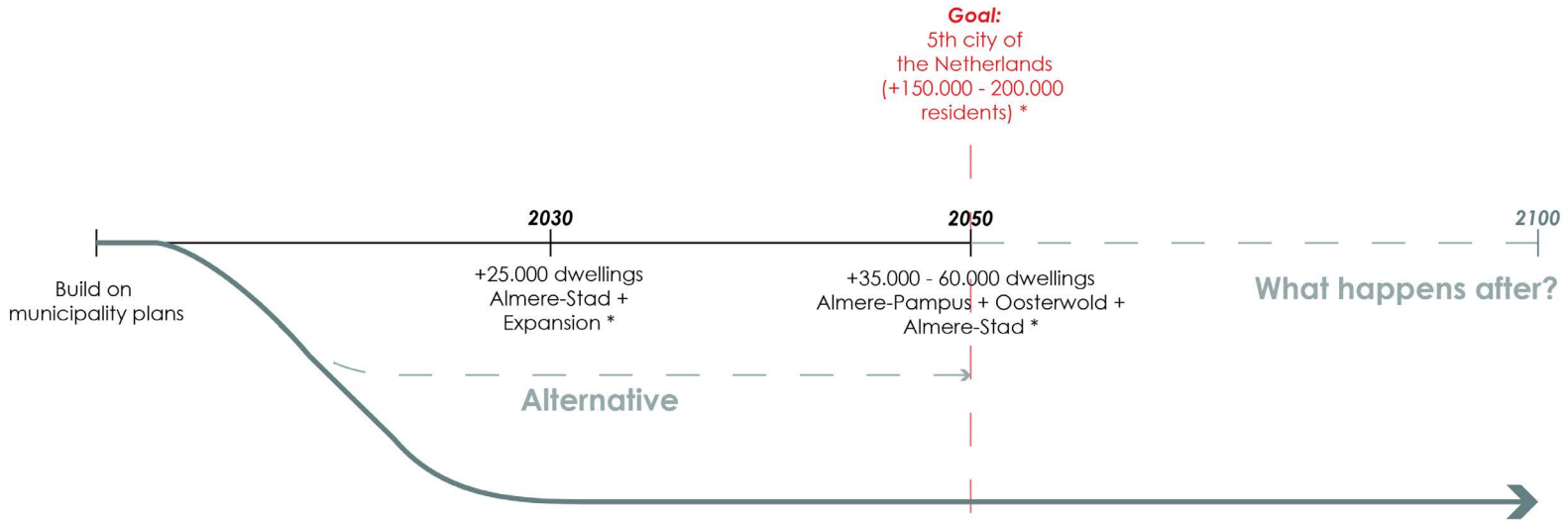


Figure 6.1: Abstract representation of policy plans and positioning (Gemeente Almere, 2021)

Understanding Almere

Urban Centers and Districts
The polynuclear city approach is assured by the Garden City concept. Various urban centers are dispersed throughout the neighbourhoods, subdivided in districts. These centers are mostly directly located linearly towards large-scale infrastructure. Almere-Haven is the only exception in this.
The fact that each urban district has its own unique orientation, creating characteristics, is a crucial element to consider in the design strategy.

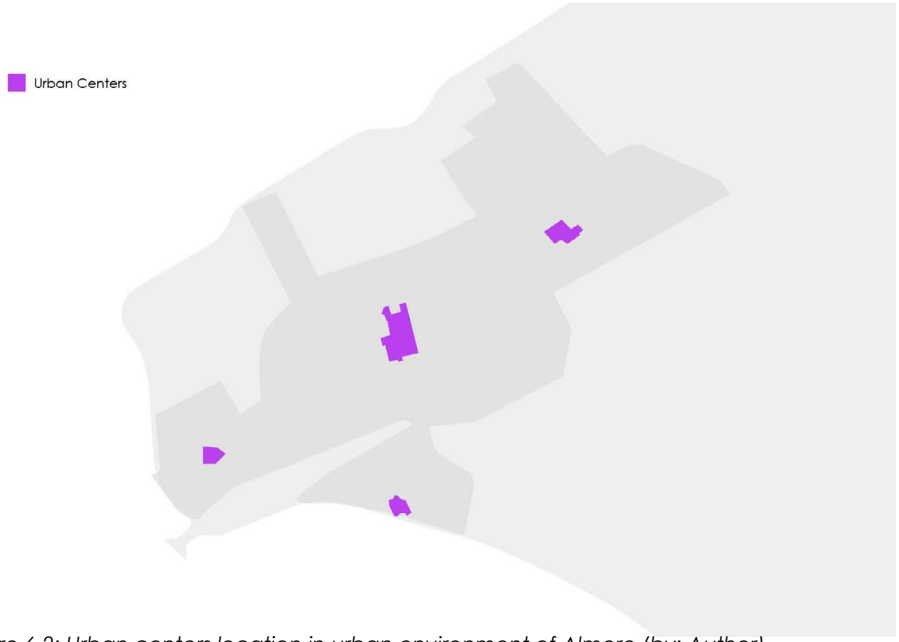


Figure 6.2: Urban centers location in urban environment of Almere (by: Author)

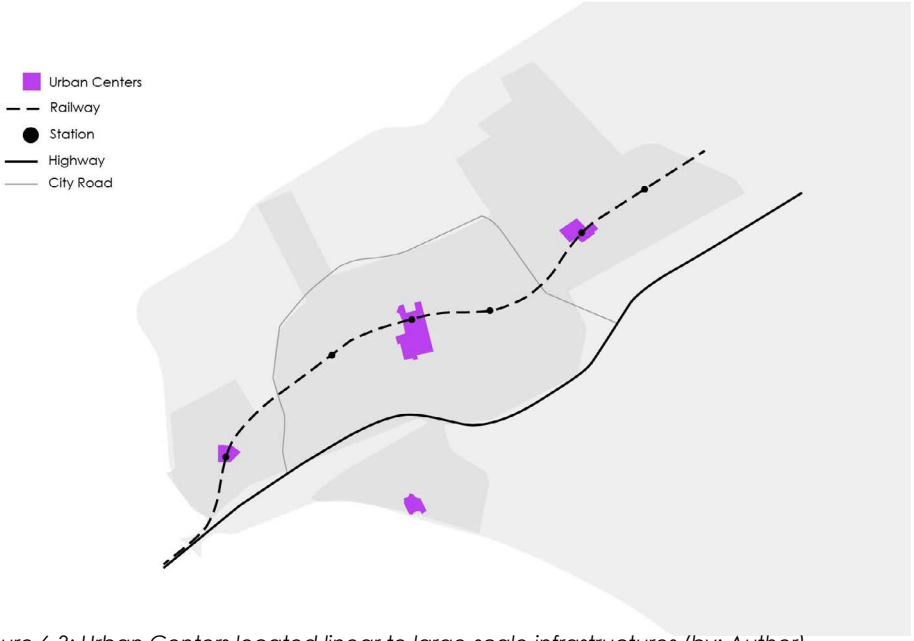


Figure 6.3: Urban Centers located linear to large-scale infrastructures (by: Author)

Figure 6.4: Orientation different City Districts (by: Author)

Higher density populations and one-person households
It is interesting to note that the majority of the denser areas of Almere are located close to the urban centres. This is comparable to areas where one-person households are more common. Both are positioned linearly along the large-scale infrastructures, so even demographic characteristics can be related to where those infrastructures are located. This gives the first impression that the railway in an important linear structure in the overall structure of the city.

Figure 6.5: Dispersion higher density hotspots (by: Author)

Figure 6.6: Dispersion of higher concentration of one-person households (by: Author)

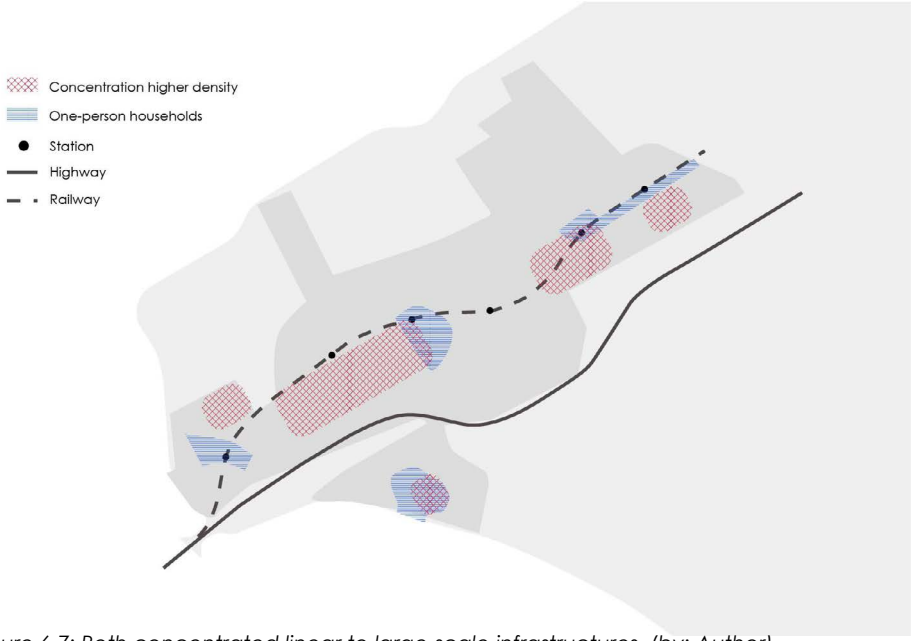


Figure 6.7: Both concentrated linear to large-scale infrastructures (by: Author)

Industries and offices

The modernist city enhances the separation of functions. Along with amenities, this applies also to businesses and office buildings. Each has a specific position in the city (Nawijn, 1986). The city's periphery is where the industrial areas and business parks are located. For easier accessibility, the business parks are situated close to the highway. Industrial areas are also found around the city's periphery and in left-over spaces along the railway. This suggests that the lines of the large-scale infrastructure are also quite important in this.

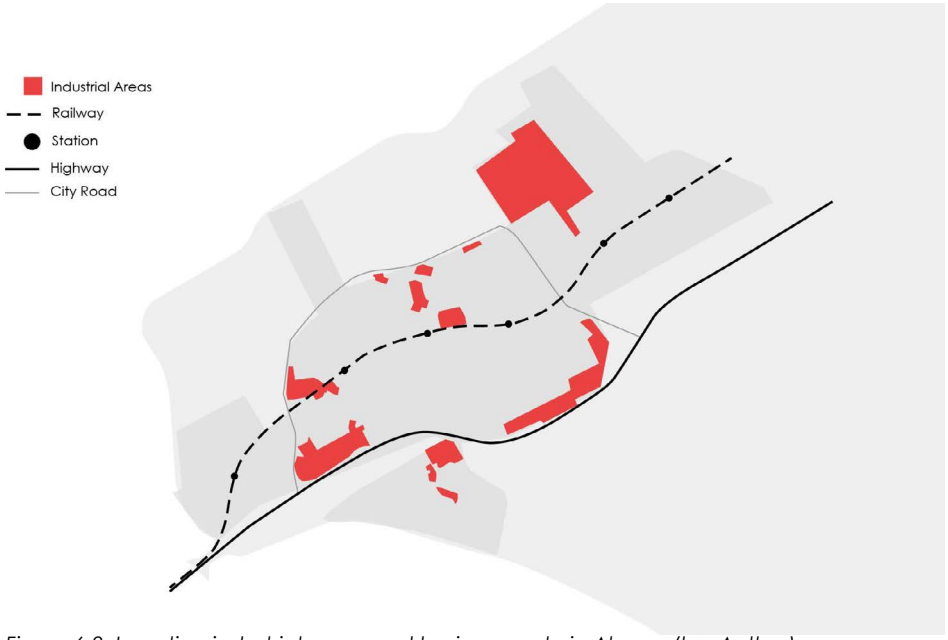


Figure 6.8: Location industrial areas and business parks in Almere (by: Author)

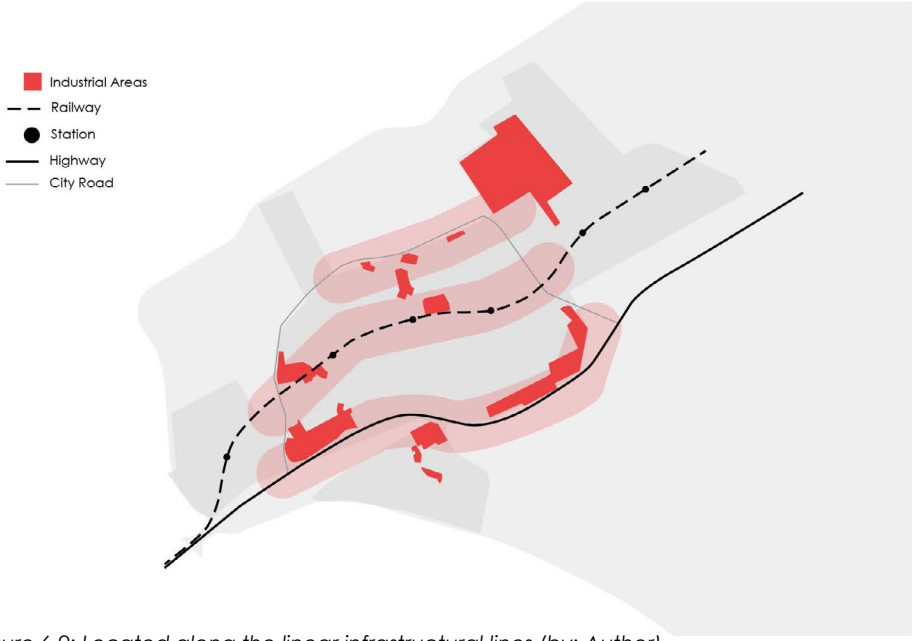


Figure 6.9: Located along the linear infrastructural lines (by: Author)

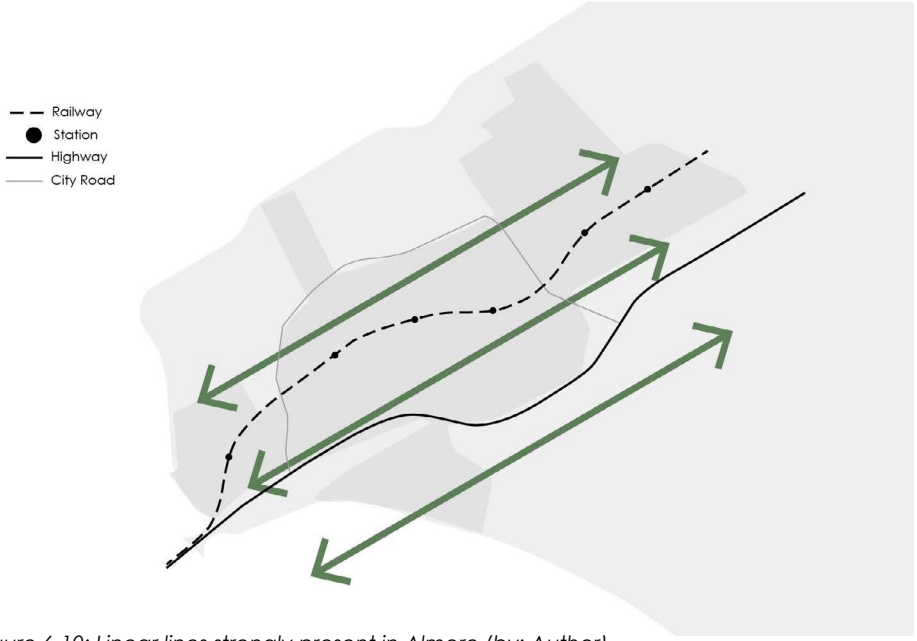


Figure 6.10: Linear lines strongly present in Almere (by: Author)

Perpendicular lines in the city

Finding the perpendicular lines in Almere and the structures associated with them is therefore interesting. These are easily found and, according to Nawijn (1986) and Reijndorp et al. (2012), represent the urban environment's exact opposite: green structures. These structures enhance the connections in Almere perpendicular to the large-scale infrastructural lines, suggesting the importance of the green structure in the functioning of the city as a whole.

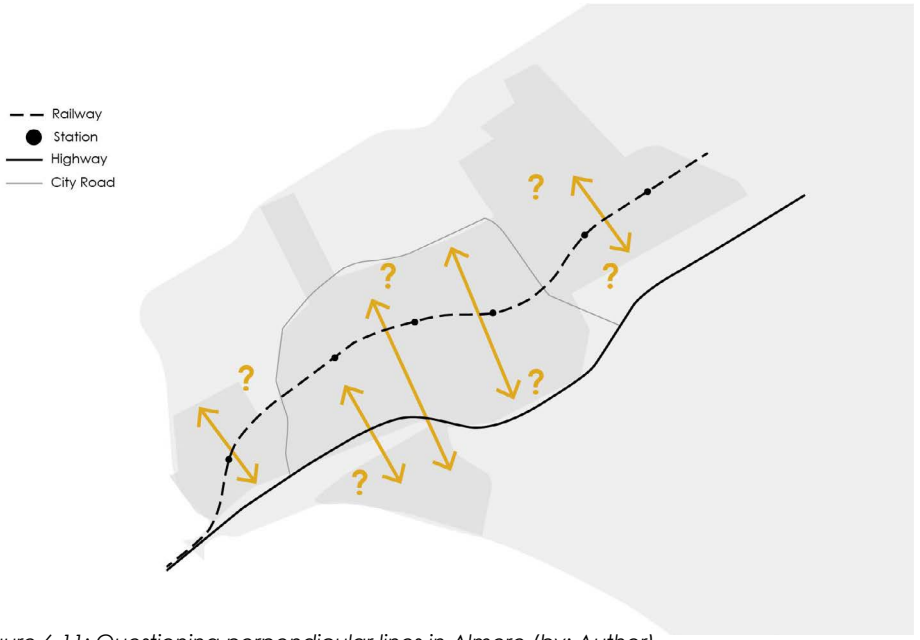


Figure 6.11: Questioning perpendicular lines in Almere (by: Author)

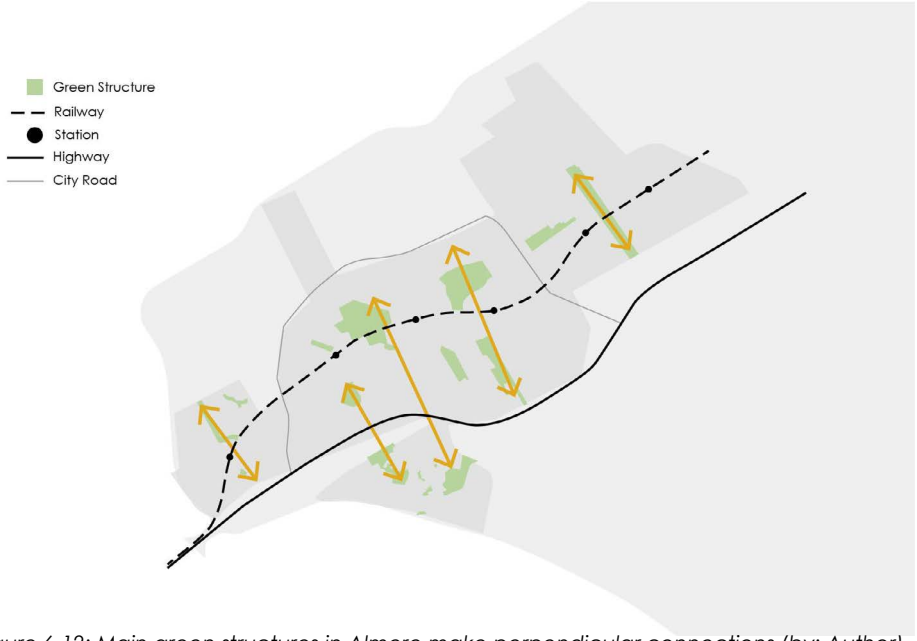


Figure 6.12: Main green structures in Almere make perpendicular connections (by: Author)

Figure 6.13: Highlighted green structures perpendicular to main infrastructure (by: Author)

Counteracting the Row House Paradigm in Almere

Opportunities to densify
The city's existing perpendicular connections are extremely valuable. The chance to connect this network to the city's outer perimeter, which also has plenty of open space and room to densify, presents itself. The neighbourhood edge tool can be used to zoom in on the city's edges as well. Creating a new Ring Structure in the process. One might wonder why greenery is sacrificed for to add volumes. In order to improve the quality of the green in the neighbourhood as a whole and to justify the ability to increase the volume of green, it is necessary to implement the tool of quality vs quantity of green in these locations. The city's parks are important to keep part of the urban fabric. They are an essential principle of the Garden City concept. As a result, the neighbourhood edge tool will be used on the city's outskirts rather than in these parks. A greater density in the ring structure leads to the opportunity of developing more mixed-use areas within the neighbourhood. The idea is to use splitting, expanding, and topping up as the main tool for the remainder of the city.

Figure 6.14: Along the periphery, the green structure connects linear and perpendicular (by: Author)

Figure 6.15: Ring Structure in the space (by: Author)

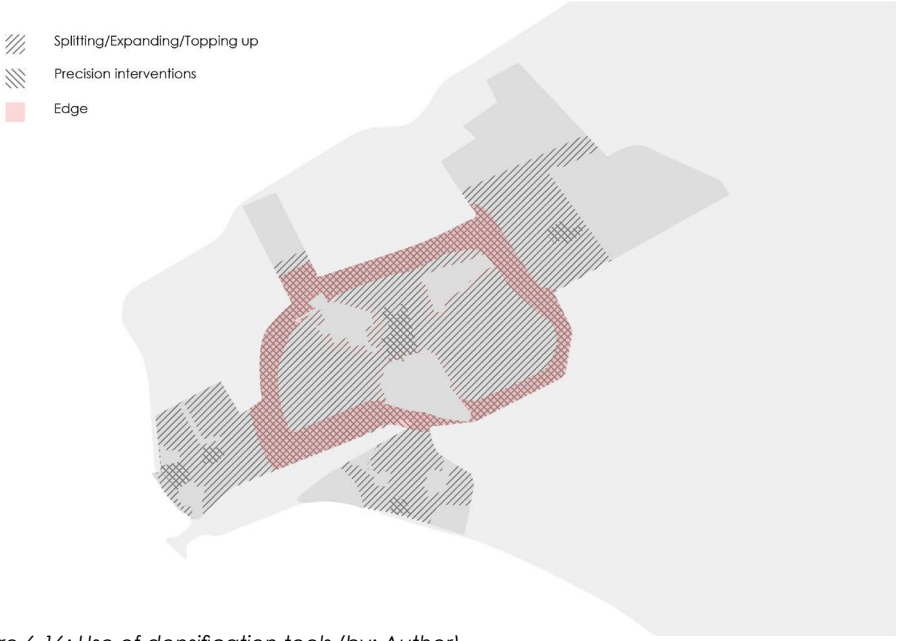


Figure 6.16: Use of densification tools (by: Author)

Add Proximity

Almere is designed as a living city. The fact that amenities and functions are frequently separated from the living environment illustrates this (figure 6.14). As a result, the living environment becomes homogenous and monotonous (figure 6.18) in terms of use. To adapt to the problem analysis, this thesis believes that the idea of Almere as a living city should be discarded. This outdated, post-war concept is founded on the requirement that working and living need to be conducted separately (Van Den Hoek, 2006). Van Den Hoek (2006) calls this a monocultural urban environment. Where only one function has been allocated to the environment. The most monotonous and homogeneous spaces with a high urban monoculture and have the largest distance to the urban centers create a ring structure around the urban district of Almere-Stad. This strip has the best opportunity of increasing proximity between living and working by implementing areas with a higher mix-use index.

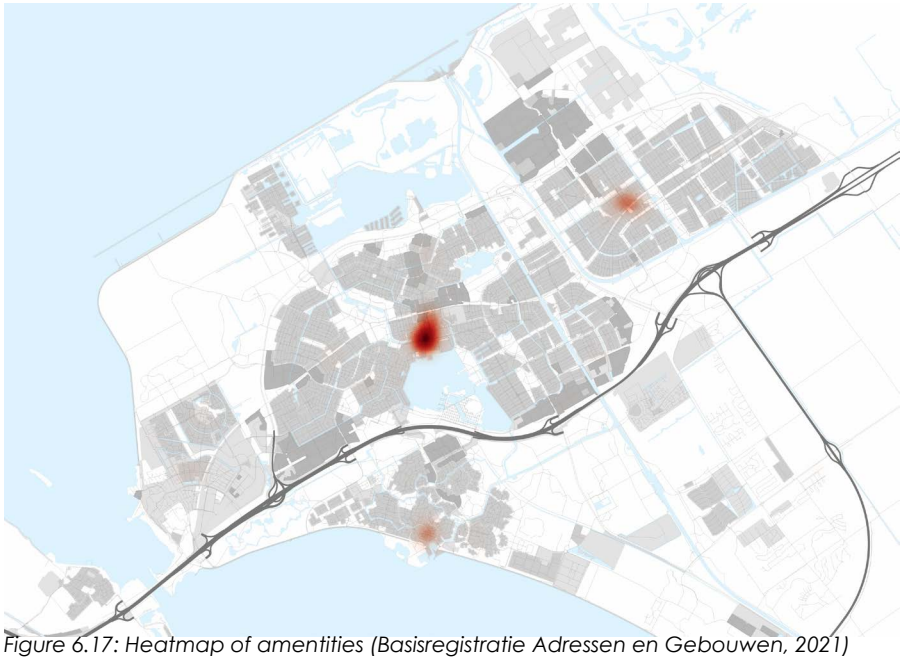


Figure 6.17: Heatmap of amentities (Basisregistratie Adressen en Gebouwen, 2021)

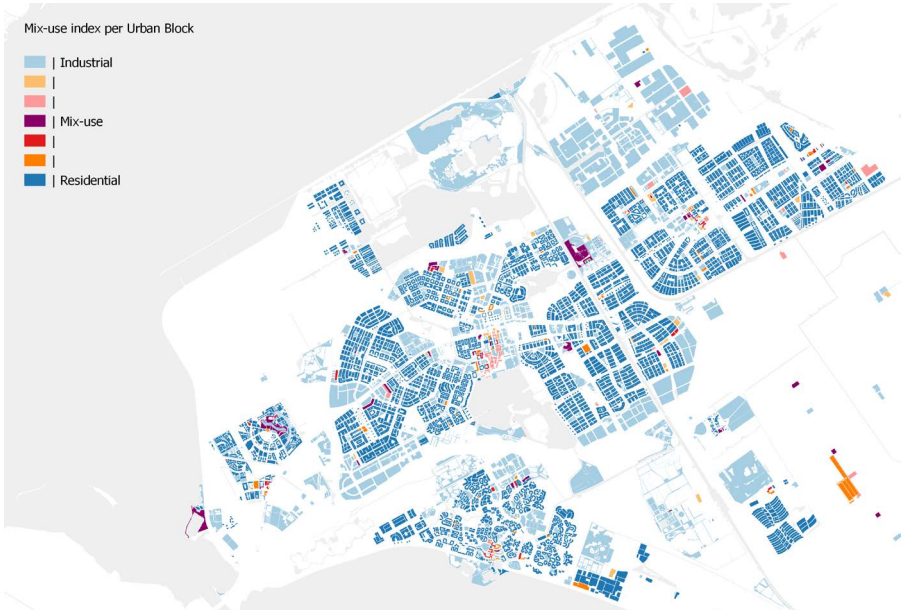


Figure 6.18: Homogenous and monotonous urban environments in Almere (by: Author)

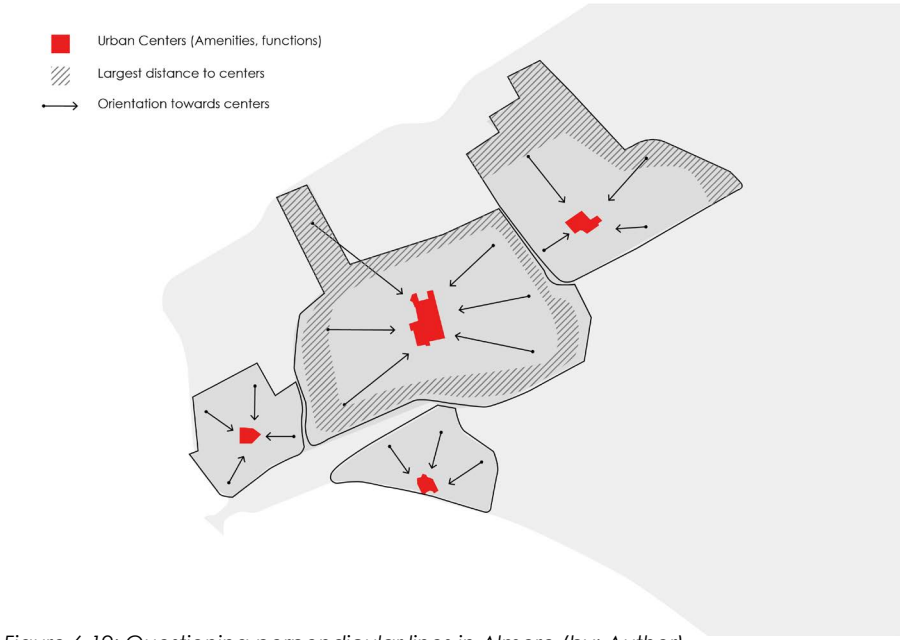


Figure 6.19: Questioning perpendicular lines in Almere (by: Author)

Create Connection
Each district has a different character, and they are all interconnected to one another by the central district, Almere-Stad. The Ring Structure also enables further connection between the districts that are not connected to each other; Almere-Poort, Almere-Haven and Almere-Buiten.
This structure has the opportunity to enhance unity among the districts and let them function in the city as one whole while retaining their unique character and identity.
The Ring Structure makes use of the existing green network that are now used as transition zones between the urban and the rural. The structure also follows a different infrastructure, the ring road of Almere (Figure 6.14).
In combination with the green structure, the Ring Structure follows the path of the bus infrastructure. In adds function to this bus infrastructure by implementing a High-Quality Public Transport line along the Ring Structure. This strengthens the Ring Structure as a whole but it also serves as an addition to the linear structures (highway and railway) in the city structure. Enhancing the city on multiple fronts.

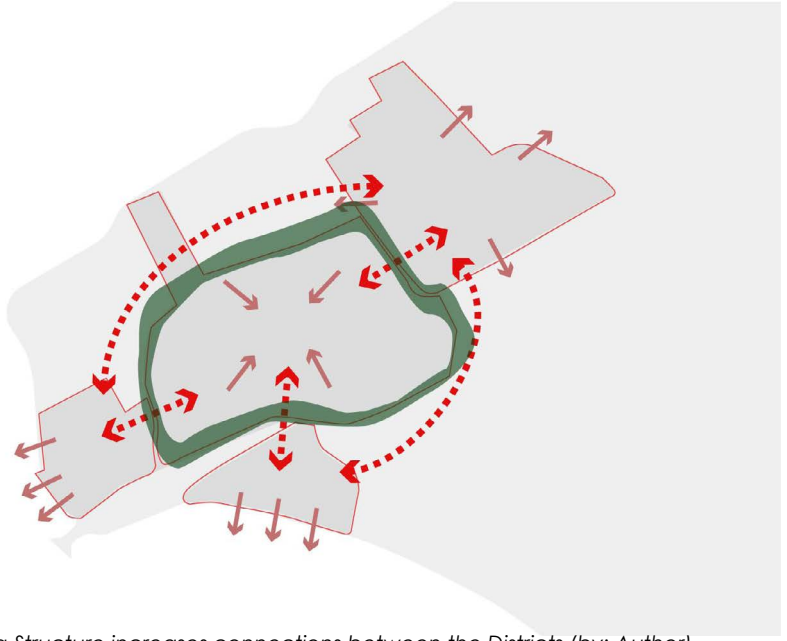


Figure 6.20: Ring Structure increases connections between the Districts (by: Author)

Figure 6.21: Current bus infrastructure in Almere (by: Author)

Ring Structure

In chapter one subchapter three, the research came to the conclusion that the housing stock and urban environment of Almere does not fit anymore to the current changes of the demography, space use and climate change, which is stated in the problem statement. The Ring Structure should enhance the city on two counts.

First, more desirable dwellings that better suit the current demography and adapt to the future demography can be realised by densifying the existing built environment. In the end, this results in a more diverse housing stock that is suitable for people from various backgrounds and with different lifestyles. Rather than forcing a lifestyle on society that is caused by the urban environment, the urban environment adapts and reacts to those lifestyles.

Second, the structure increases proximity between amenities and residential areas, which is mainly caused by the implementation of the Row House Paradigm in Almere. The current proximity between amenities and residential is too large. Due to the current urban sprawl, which further increases distances, the positioning of the four Urban Centers in the city are insufficient and lead to an increase in car use. The Ring Structure should create an additional area of concentration of amenities. What kind of amenities should be used and at what scale should be determined by further research.

The redesign of the urban environment is not only about constructing dwellings (van den Boomen et al. 2022) and not only creating amenities either. This Ring Structure increases the opportunity of adding amenities combined with the creation of a more diverse housing stock. The existing green network and play a leading role in this. This suggest that the densification tool focused on fridges will be leading in further developing this strategy.

Figure 6.22: Ring Structure increases proximity by adding amentities (by: Author)

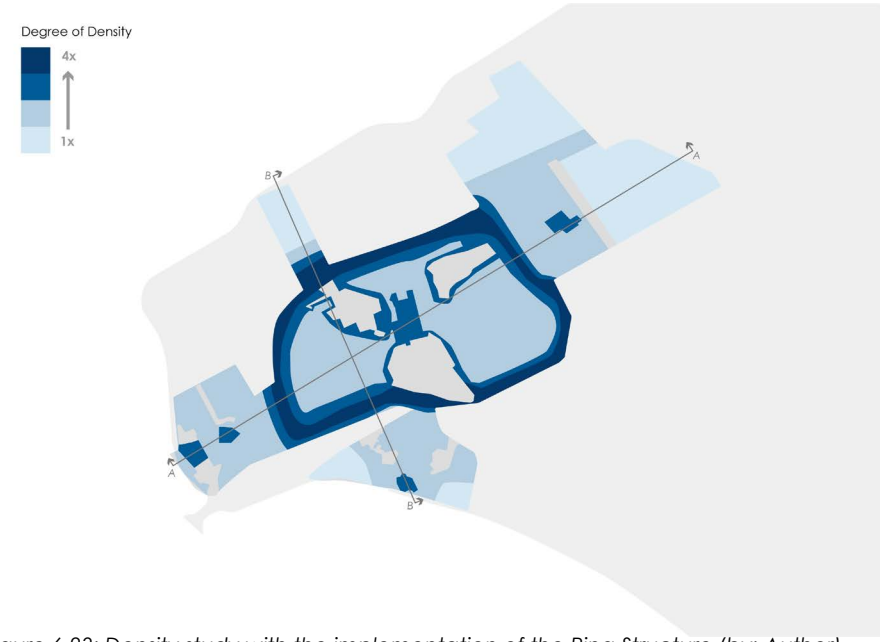


Figure 6.23: Density study with the implementation of the Ring Structure (by: Author)

Vision Map

Legend

Urban Environment

- Central urban
- Outer Center
- Green Urban
- Village-like Center
- Mix-Use Dense
- Mix-Use Industry
- Industrial Area

Vision

- Ring Struture
- Implementation Areas
- Strategic Future Areas
- Bus Infrastructure
- Increased Quality Bus Infrastructure
- Railway
- Trainstation Influence Area

Green Structure

- Recreation
- Natural
- Densification transition to Green
- Green natural connections

Water Structure

- City Scale
- National Scale

0 1 2 3 km

Figure 6.24: Vision map

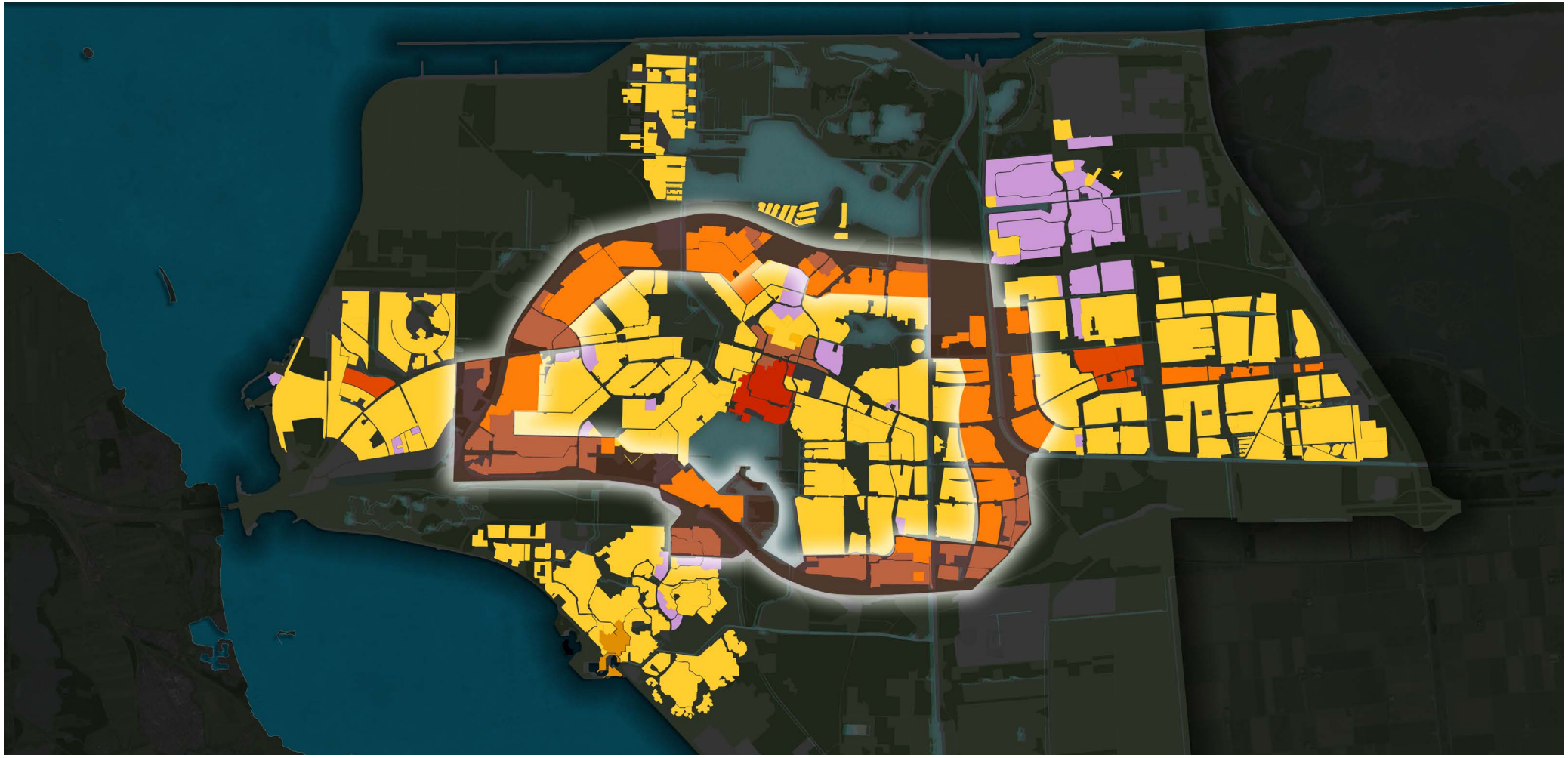


Figure 6.25: Creating new Urban Environments

The design strategy leads up to the vision, visualised in the vision map. In order to better understand the vision map, the different parts making up the map will be further explained. The map has a 30 degree rotation. The stimulates the idea that a different perspective of Almere is created. This perspective accentuates and demonstrates the formation of unity and portrays Almere as a single entity.

Urban Environment

As identified in the previous subchapter, the ring structure enables a higher density in dwellings and residents, but also in amenities. This results in a new type of urban environment, called Mix-use Dense Urban.

This environment will be created by implementing the tools defined in chapter five. Another important development is the emergence of a new category of industrial areas known. In this map classified as Mix-Use Industry. However, because this thesis only addresses and focuses on residential areas, these areas will not be discussed further in this research. It is interesting for the municipality or other researchers to look into how this urban environment might develop further. Industrial areas fall beyond the scope of this research. The implementation of this Ring structure has the capacity of doubling the amount of inhabitants in the city. In order to achieve this, the structure needs to be able to house at least 200.000 people.

Figure 6.26: Ring Structure builds upon existing green structures and networks

Green Network

The green structure builds upon the principles set by the implementation of the Garden City concept. The role of the green structure is to create connections between recreational- and natural green to enhance nature and biodiversity in the city and creating a green living environment. These connections, portrayed by the arrows, are an important network to maintain.

The implementation of the tools aims towards constructing volumes in unused left-over spaces, these are frequently green structures. This serves as the foundation for the ring structure as the design strategy for Almere.

Unfortunately, this results in less green surface area in the city. However, this arises the potential to create high density green space by using the tool described in the previous chapter. Thus, even though there will be less green space overall, it will still have more potential and be more useful. In these areas, additional volumes will be placed to house the growing population and amenities. The buildings and public space need to establish a more effective green urban environment that connects to and strengthens the Garden City concept. Further investigation on the neighbourhood scale in the next chapter will reveal ways how this could be achieved.

Figure 6.27: Reviving Public Transport through High-Quality connections

Public Transport

Another important aspect of the vision is the relation of the strategy to the public transport. The municipality has the aim to densify along public transport infrastructure (Gemeente Almere, 2020; 2021). The public transport infrastructure is currently a major strength in the urban environment of Almere, as investigated in the analysis of Almere in chapter four.

The Ring Structure enables a further exploitation of this strength. The densification is concentrated in combination with this infrastructure and has the opportunity of enabling more alternative forms of mobility in the city. The combination of this creates a High-Quality Public Transport system in the city. This intervention is eventually aimed to reduce car mobility on the city scale.

According to the previous subchapter, the dwelling density in the Ring is planned to quadruple (figure 6.18). The Ring has a surface area of approximately 1200 ha. Almere currently has a density of 33 dwellings per ha. This translates to 132 homes per ha inside the ring structure (Density times four). 1200 hectares x 132 dwellings equals 158.400 dwellings. The Ring Structure can hold 316.800 people (assuming two people live in each household).
However, to become more precise, these calculations can also identify what the proposed density of the ring should be to accomodate the 200.000 residents extra. With the current density of dwellings being 33 per ha, with an average household size of 2,4 (Alle Cijfers, 2023) the density of residents is 79 residents per ha in the current city. The average residents per ha in the ring then needs to be to devide the total population added by the surface area of the ring. this is 200.000 devided by 1200 is 167 residents per ha. However, the current population needs to keep living in the current neighbourhoods. Therefore, the density of the ring needs to be 246 residents per ha (167 + 79). The density in the ring needs to increase to 3,1. However, design is also about fitting the goals into the current situation and structure of the city and the neighbourhood. By doing this, qualities will be maintained. Unfortunately at the cost of density, which might be lost in the process. Therefore, it is important to identify how the design could be fitted in the current situation and structures of the city while maintaining the highest amount of density.

Figure 6.28: Abstract visualisation maximum possibilities

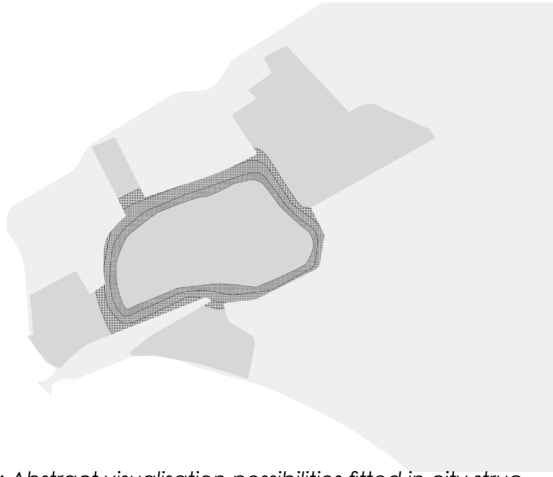
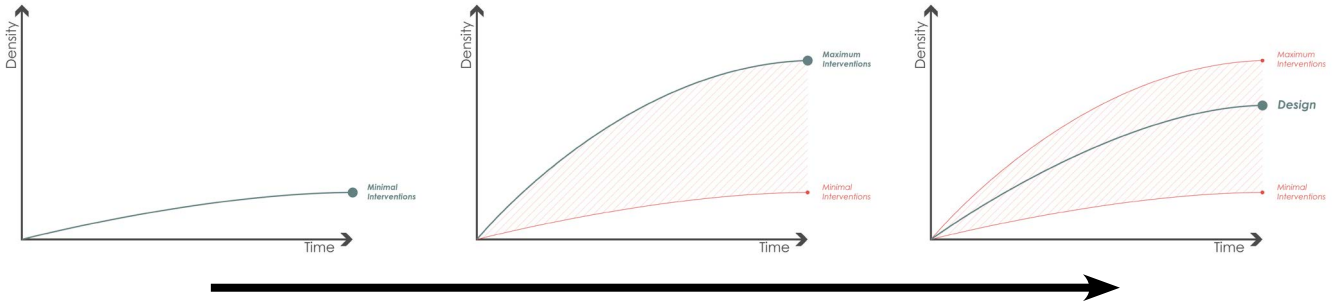


Figure 6.29: Abstract visualisation possibilities fitted in city structures



7.

THE IMPLEMENTATION

Focus areas

The vision map also highlights the position of the neighbourhoods for further focus in the design strategy.
The first case study area is the neighbourhood of Achterwerf in Almere-Haven. This neighbourhood is also discussed in chapter four. The implementation of the design tools will focus on retrofitting the current housing stock to create a more densified and diversified urban environment. The goal of this area is to show the limitations of the Row House Paradigm. To identify what is possible within the paradigm. The aim is to investigate how lifestyles could be changed while applying the lowest amount of interventions in urban environment and how new lifestyles could be accomodated.
The second focus area will focus on the neighbourhood of Muziekwijk-Noord in Almere-Stad. As seen in figure 7.3, this neighbourhoods is located in the ring structure. Therefore, the design of the neighbourhood will show what needs to be implemented to reach 3-4 times the ammount of residents. In addition, the neighbourhood has to enable a different type of lifestyle, meaning it should also house different amenities.
The different focus area will also focus on engagement with residents and the municipality. What do I get out of it? This is a common question posed by various parties involved in the designs and plans of a city or even a neighbourhood in an urban setting. The focus areas will aim to pinpoint a tactic for persuading residents of the argument made throughout the thesis. A part of the persuasion has already been given in the form of images and impressions. Also, the necessity of change has already been made known to stakeholders in chapter two. Therefore, the focus here will be on the possible economic benefits of this transition towards a Adaptive Alternative Almere.

Figure 7.1: Achterwerf

Figure 7.2: Muziekwijk-Noord

Figure 7.3: Vision map with focus areas highlighted

Figure 7.4: Topographical map of Achterwerf (PDOK, 2020)

Analysis of the neighbourhood
The study, done in chapter four, came to the conclusion that the streetprofile emphasis on the smaller scale, which was crucial in this kind of neighbourhood. Demonstrated by the separation of living spaces and spaces for mobility (figure 7.5 & 7.6). For the front or back of the house, there is no established rule. Within a street, these can change (figure 7.8 & 7.9).
More importantly, anonymity is more clearly expressed in interactions with other residents of the urban block rather than in relationships with the residents in different urban blocks in the neighbourhood. The average household size in this neighbourhood is two (CBS Statline, 2022).

Buildings and blocks
The buildings facilitate this type of anonymity. The buildings are oriented and place in such a way they create more intimite places in the urban block between neighbours in close proximity. The urban form, which has the look of a cauliflower and gets its name from it ('Bloemkoolwijk'), demonstrates this well. Throughout the neighbourhood, the same arrangement of buildings has been used. Apartments are frequently located in the corners of the cauliflower, and four row houses are positioned between the corners. Three row houses make up the ends of the block. Figure 7.13 on the following page illustrates this. A significant amount of buildings are suitable for topping up. The roofs are semi-flat (figure 7.5 & 7.8).

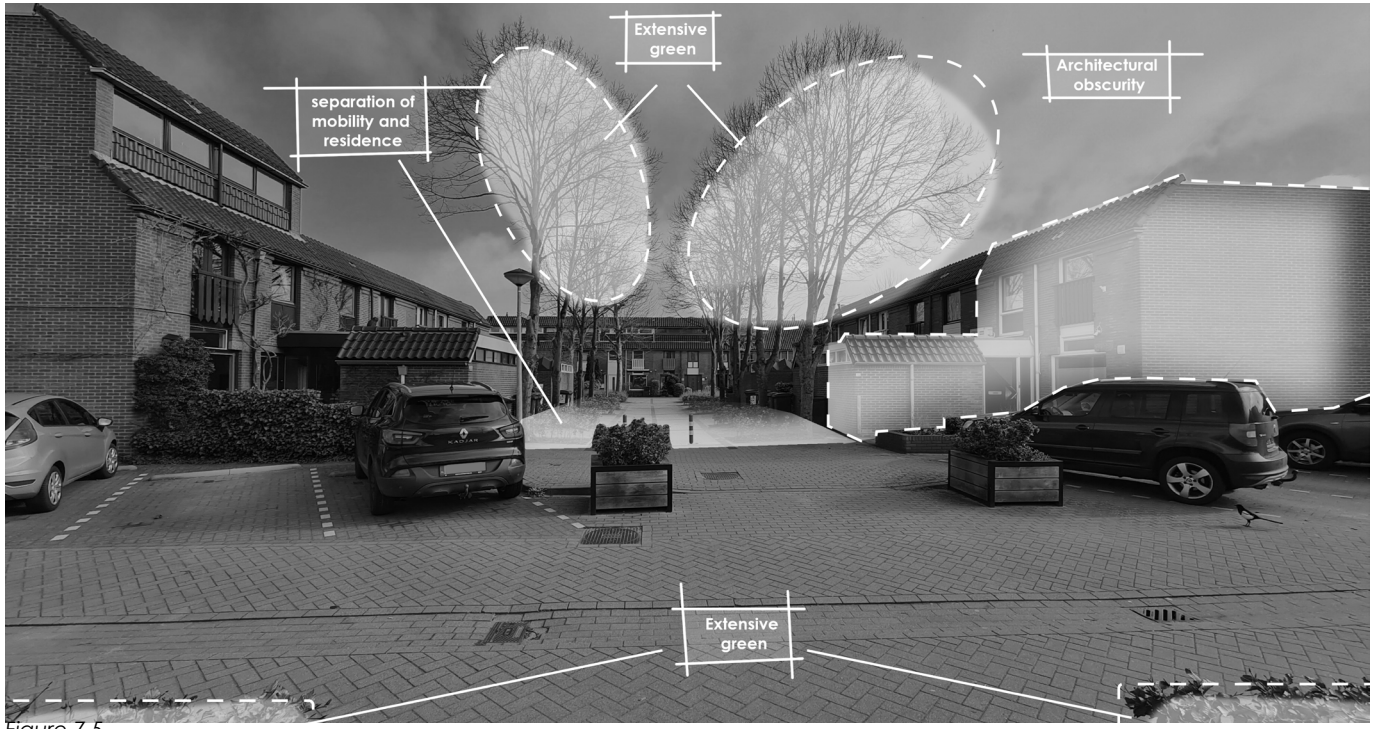


Figure 7.5


Figure 7.6


Figure 7.7


Figure 7.8


Figure 7.9

Public space

The public space in the neighbourhood is ordered. There is a distinction between space for staying and space for moving. Figure 7.11 shows that the space intended for staying places a greater emphasis on green than the space intended for moving. Figure 7.12 demonstrates how car infrastructure directs traffic to areas with parking lots. The other spaces are frequently aimed to slow-moving vehicles and pedestrians. The neighbourhood is divided in two by a main bicycle route that is important on a city scale. Typically, the main bicycle route of Almere-Haven does not cross the car infrastructure. Bicycle paths go underneath car infrastructure via tunnels. In this neighbourhood, however, cars must cross the infrastructure for bicycles twice. A busline is situated to the north of the neighbourhood. Busstops are situated 400 meters in either direction of the neighbourhood.

Figure 7.10

Figure 7.11

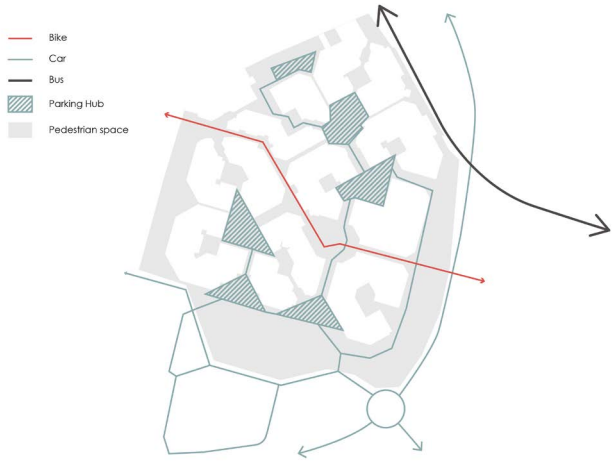


Figure 7.12: Infrastructure in Achetwerf

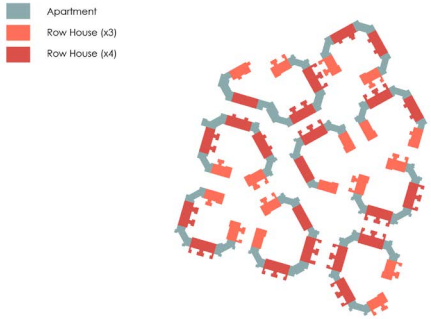


Figure 7.13: Morphology and arrangment of housing

Design study volumes and space

As previously stated, the goal of this neighbourhood is to explore the possibilities and maintain the qualities provided by the Row House Paradigm.

Therefore, this neighbourhood will only focus on the splitting, expanding, or topping up as implementation method. A design study of the various options will be conducted in order to identify various solutions and to identify the possibility of different living environments. The neighbourhood is divided in different areas with the purpose of showing different design possibilities to different densities. The design study sought to determine what needs to be retrofitted in order to accommodate one-and-a-half times, two times or three times the population.

During the design study, the vast amount of possibilities for splitting, expanding and topping up will be made transparent.

In terms of diversity, different household sizes are taken into account in this design study. The different colours in the study identify the housing suitable for different household sizes. This should identify how many people could be added in the neighbourhood. The different dwellings will be suitable for one-, two-, three- or four-person households.

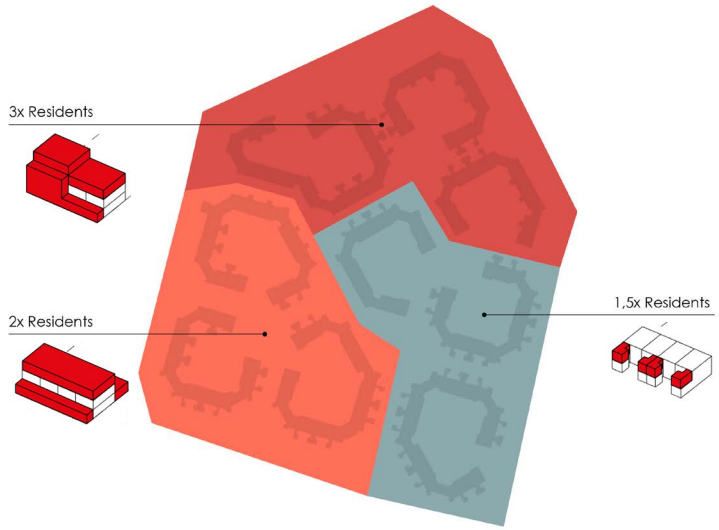


Figure 7.14: Division of densities in Achterwerf

Low Density Interventions

The Low Density interventions only focuses on splitting and seperating dwellings. Currently, the dwellings measure roughly six by nine metres. The four-home row has room for six dwellings. A 54 m2 ground-base dwelling for the elderly can be one of the dwellings. On the ground floor, two additional residences with a surface area of 81 m2 surround this one. These homes are designed with a three-person household in mind. The residences here are the same as those in the three-row block. Three homes, each geared towards a single person's household, are located on the upper layer of the three-row block. They use a staircase constructed in the sheds of the current situation to enter their home. Two dwellings in the four-row block are specifically designed for this kind of household. Additionally, this row contains a home with a 108 m2 surface area designed for a larger family of four.

Eight people live in the four-dwelling row and six people live in the three-dwelling row, according to CBS Statline (2022). in this new situation this amounts rises to 16 and 9, respectively. 1,5 times the current amount.

This version of the densification strategy shows the possibility of a conservative approach towards the backyards. In this way, the private space is still connected to the Row House Paradigm. The backyards in this situation are still private and are owned by the dwellings on the bottom floor. This evidences the fact the limitations of the Row House Paradigm are not reached with these set of interventions.

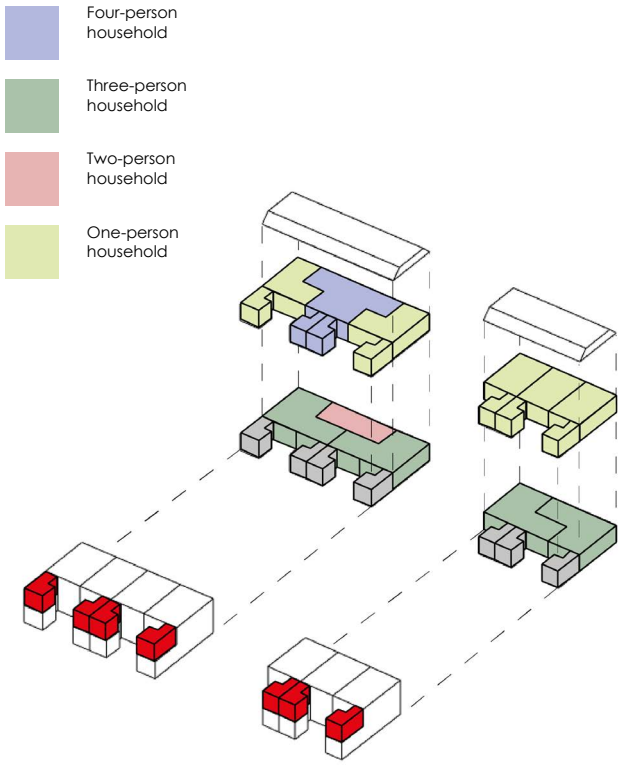


Figure 7.15: Isometric view sharing and splitting

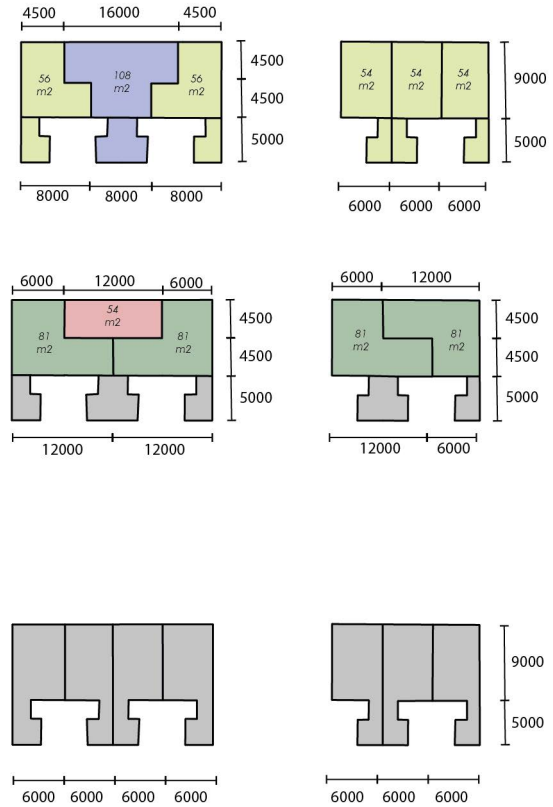


Figure 7.16: Floor Plans

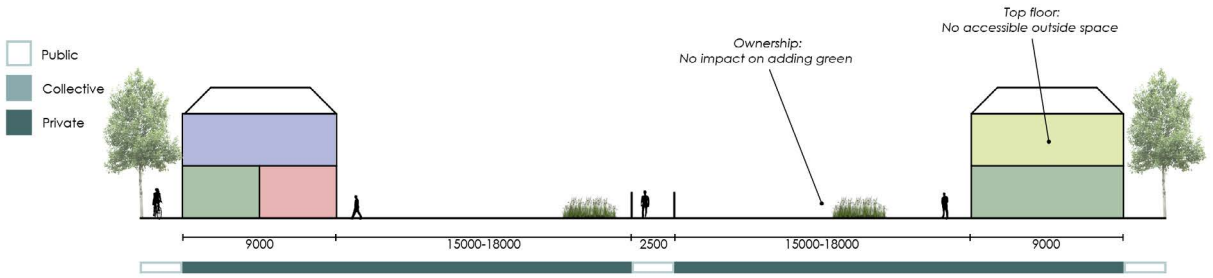


Figure 7.17: Section of a urban block

Figure 7.18: Impression of Low Density Interventions

Moderate Density Interventions

The expanding and topping up tools can be used for these interventions. The ground-level homes on the first level are also designed with elderly people in mind. These 114 m2 dwellings are larger and more comfortable. These can be back-to-back homes in the four-row block, whereas in the three-row block they are arranged like the current lay-out. The second layer will be topped up with an additional layer. The dwellings on the second level can be seen as spatious single-family homes focused on larger households of three or four people, these have a surface area of 108 m2. The expansion of three meters in the front ensures the accasibility of the dwellings on the second layer. For these larger residences, the expansion on the back side may be used as a private area. The extra room created by the expansion on the backside has the potential to be turned into a communal space. The inhabitants could also construct a canopy to create a private area in the communal space.

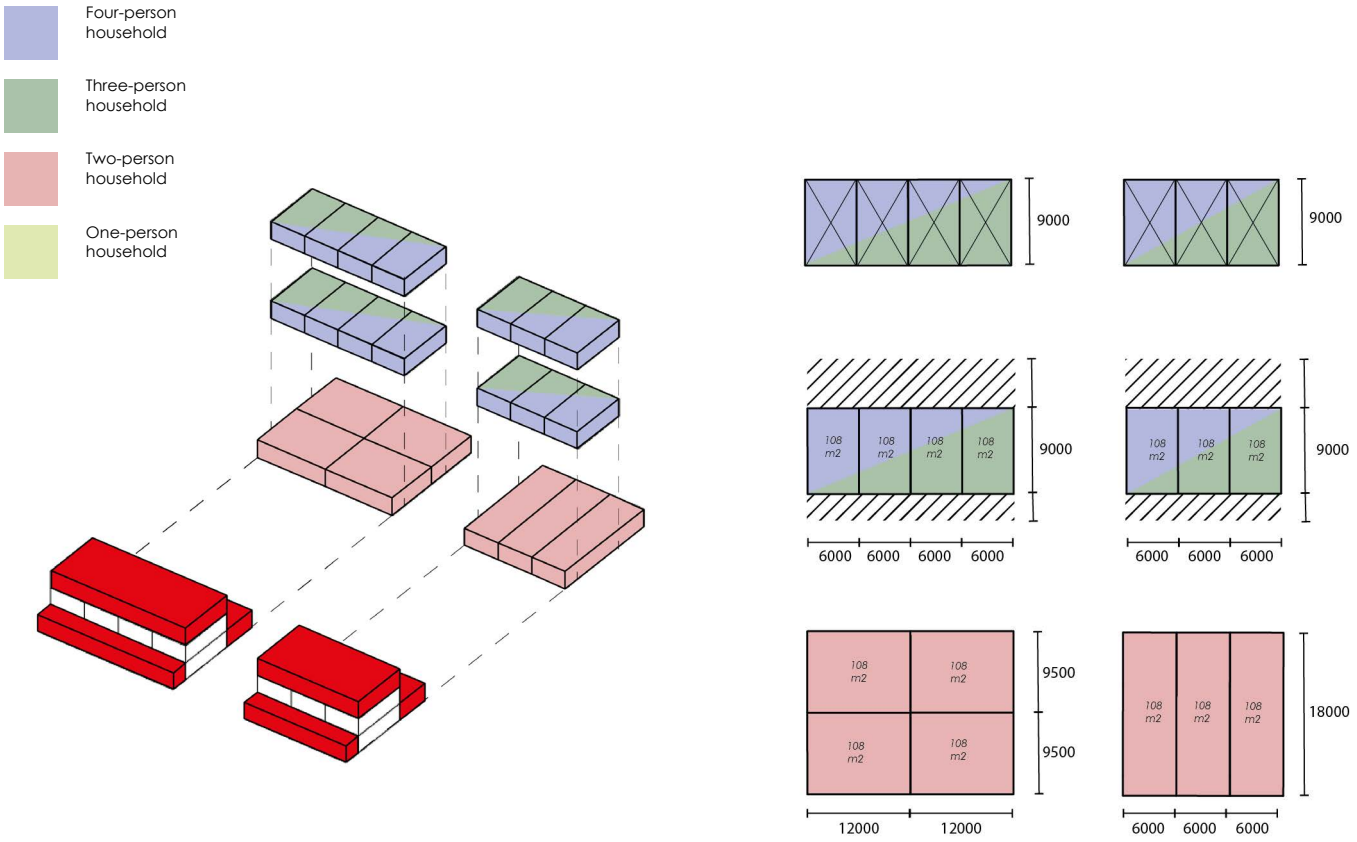


Figure 7.19: Isometric view expansions and topping up

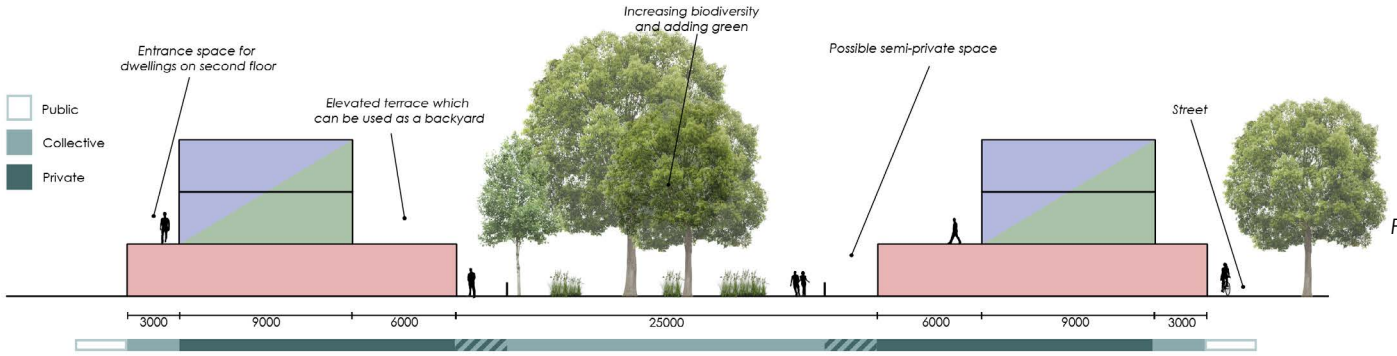


Figure 7.21: Section of a urban block

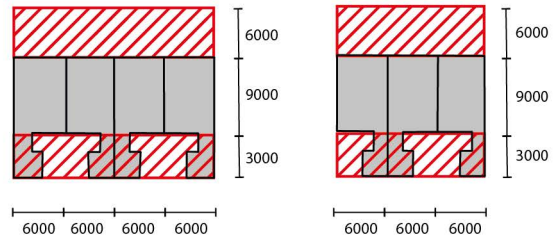


Figure 7.20: Floor Plans

Figure 7.22: Impression of Moderate Density Interventions

High Density Interventiions

The expanding and topping up tools are used to an extensive amount in this density. Expanding and topping up will for the first time be applied on multiple floors. The increased height of the buildings enables a higher density. The downside of this is the need for space for access routes to the dwellings where stairs and elevators need to be placed. This is where the most amount of space, created by expanding the buidling, will be aimed towards. This enables the creation of different dwelling types aimed to different household sizes.

In contrast to the other density interventions, these interventions enable less private space in the urban block. This intervention works best when the public space, also in the urban block, is completely public. This will create a new dynamic and atmosphere in the urban block aimed to increase efficientcy of space within the urban block.

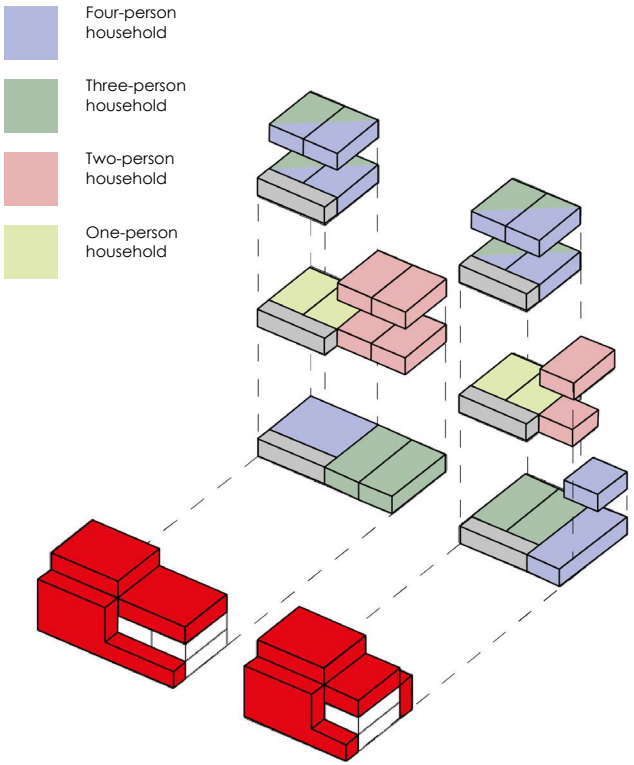


Figure 7.23: Isometric view High Density Interventions

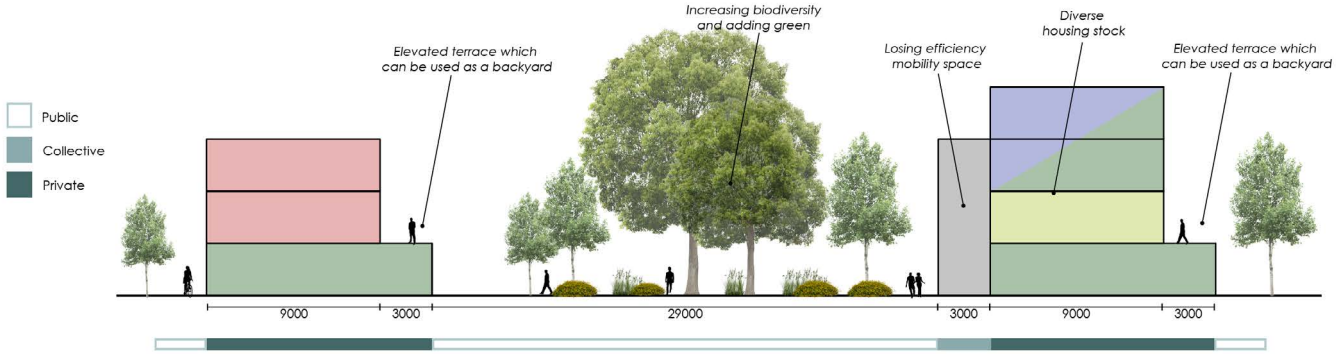


Figure 7.24: Section of a urban block

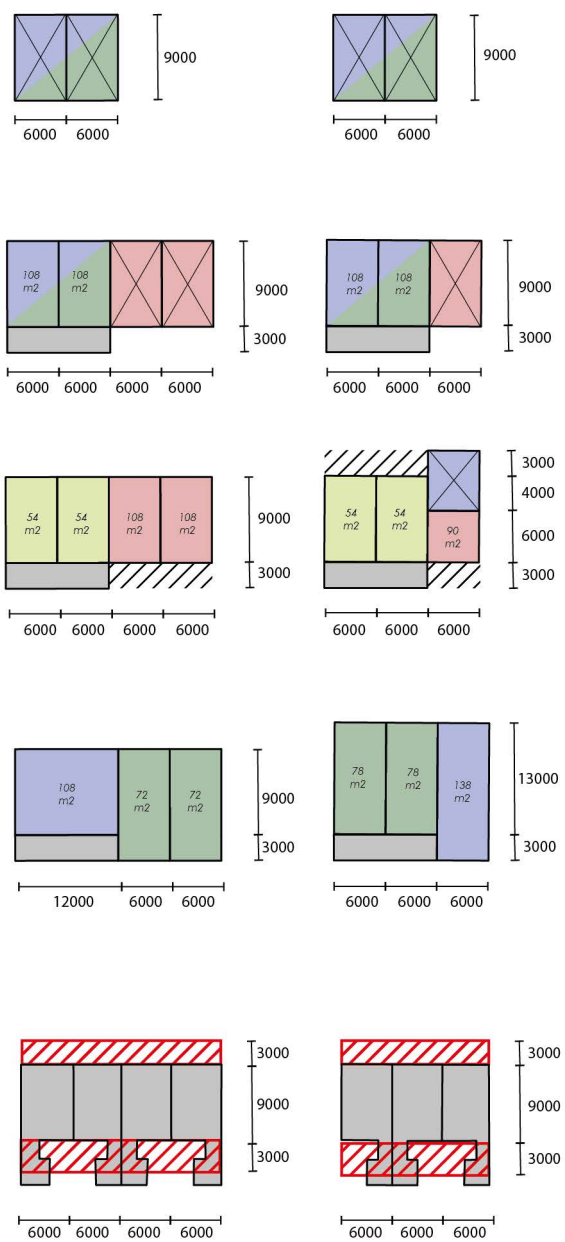
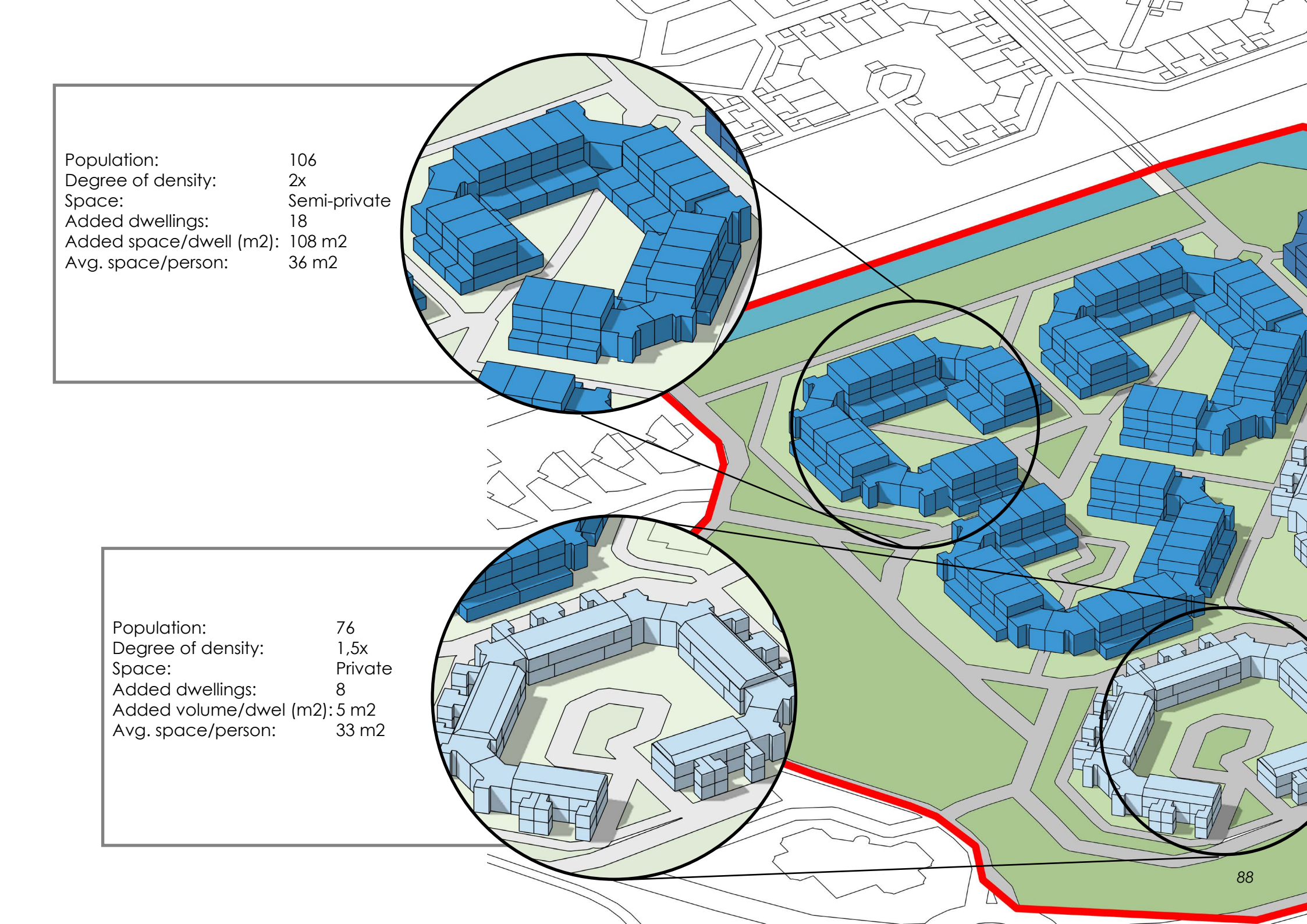


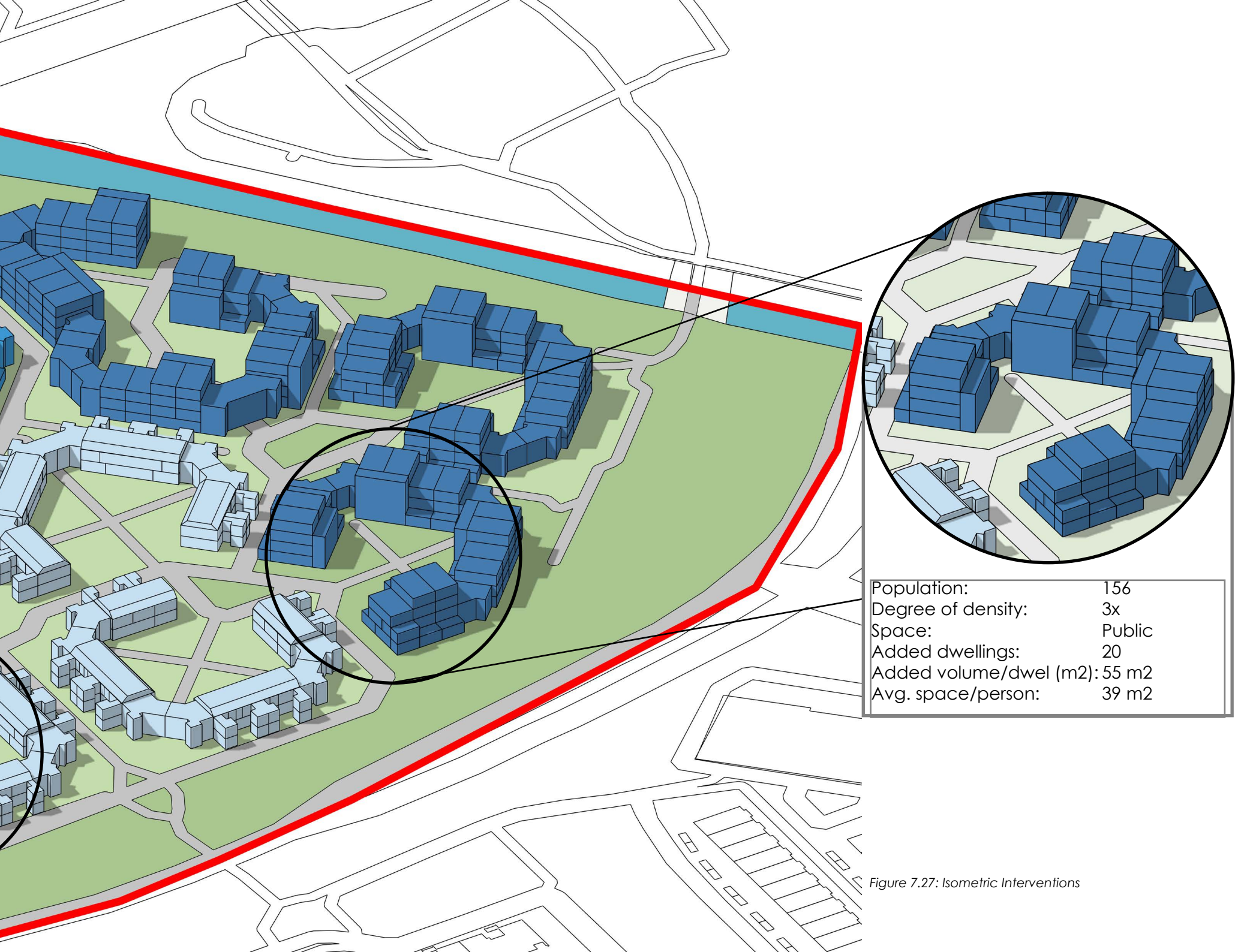
Figure 7.25: Floor Plans

Figure 7.26: Impression of High Density Interventions



Population:	106
Degree of density:	2x
Space:	Semi-private
Added dwellings:	18
Added space/dwell (m2):	108 m2
Avg. space/person:	36 m2

Population:	76
Degree of density:	1,5x
Space:	Private
Added dwellings:	8
Added volume/dwel (m2):	5 m2
Avg. space/person:	33 m2



Population:	156
Degree of density:	3x
Space:	Public
Added dwellings:	20
Added volume/dwel (m2):	55 m2
Avg. space/person:	39 m2

Figure 7.27: Isometric Interventions

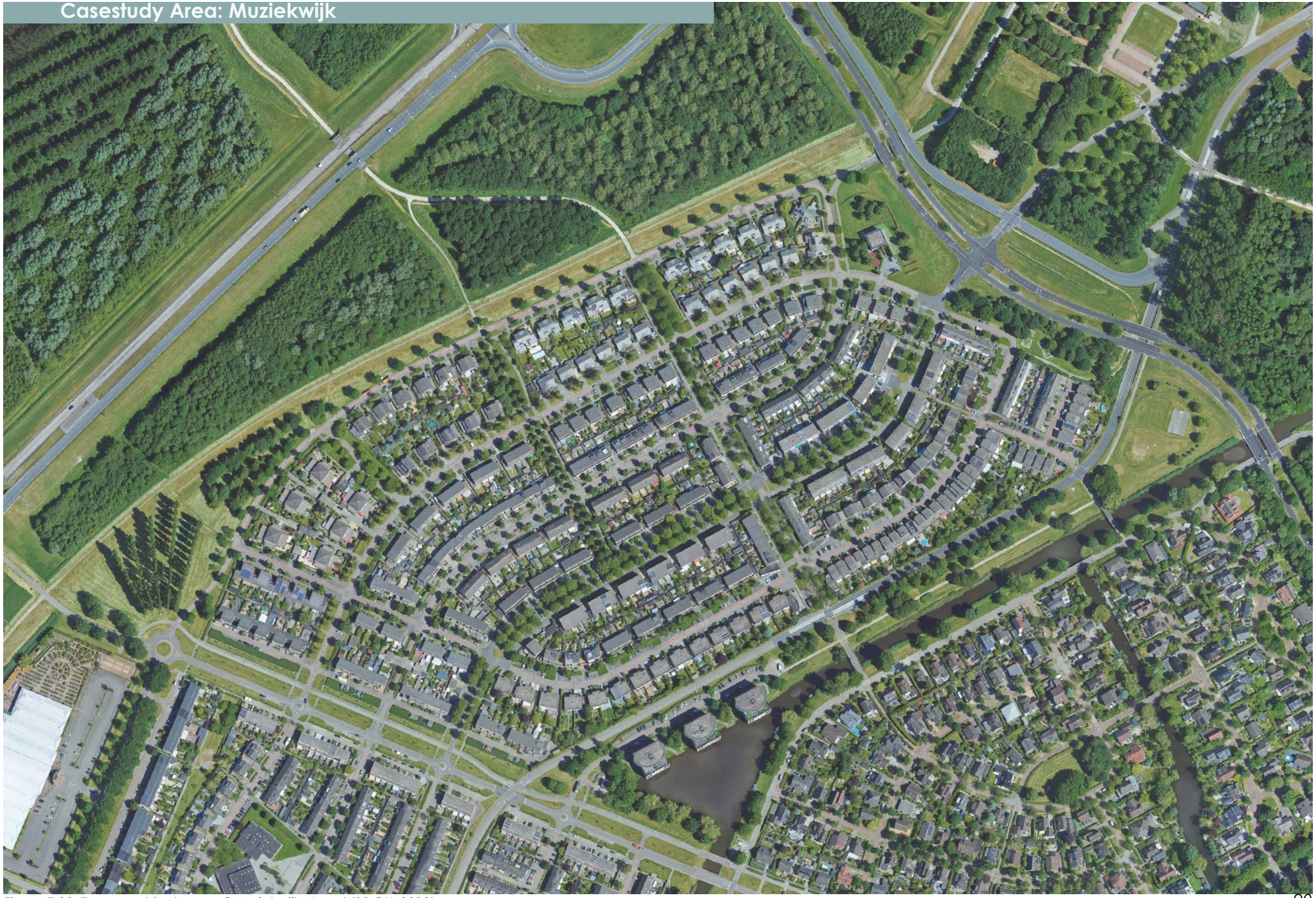


Figure 7.28: Topographical map of Muziekwijk-Noord (PDOK, 2020)

Analysis of the neighbourhood

The neighbourhood originates from the 1990s, which is considered as a "intermediate" neighbourhood. This is a neighbourhood that sits between the time periods of the Bloemkoolwijk and VINEX, as established in chapter four. The distinction between residence and mobility is abandoned (figure 1). The primary purpose of the street is to facilitate mobility, which also occupies the largest area in the streetprofile. The ability of cars to park in front of the house (figures 2, 3, and 5) is a good indicator of this. Throughout the neighbourhood, parking spaces and greenery, such as trees or green spaces, are frequently alternated. The networks of bike infrastructure in this specific neighbourhood are also connected to the green spaces.

Buildings and blocks

Typical in this time period is the straight and rectangular urban form of the neighbourhood. The morphology of the buildings is straight, resulting is less anonomous spaces and creating long streets.
The backyards are accessible via a small paths which runs between the backyards of two blocks. Here, anonymity is more expressed in less interactions with other residents of the urban block but to a lesser extent more to the neighbourhood. The majority of the buildings in the area are categorised as row houses. Due to the neighborhood's northern location on the edge of the city and in accordance with the Garden City Concept, the buildings situated here are categorised as semi-detached houses (figure 7.37). Architectual obscurity is less present in this neighbourhood. Individual houses are able to be identified. However, they still have simular appearances (figure 7.29). Several amenities, including school care and barbers, can be found throughout the neighbourhood.

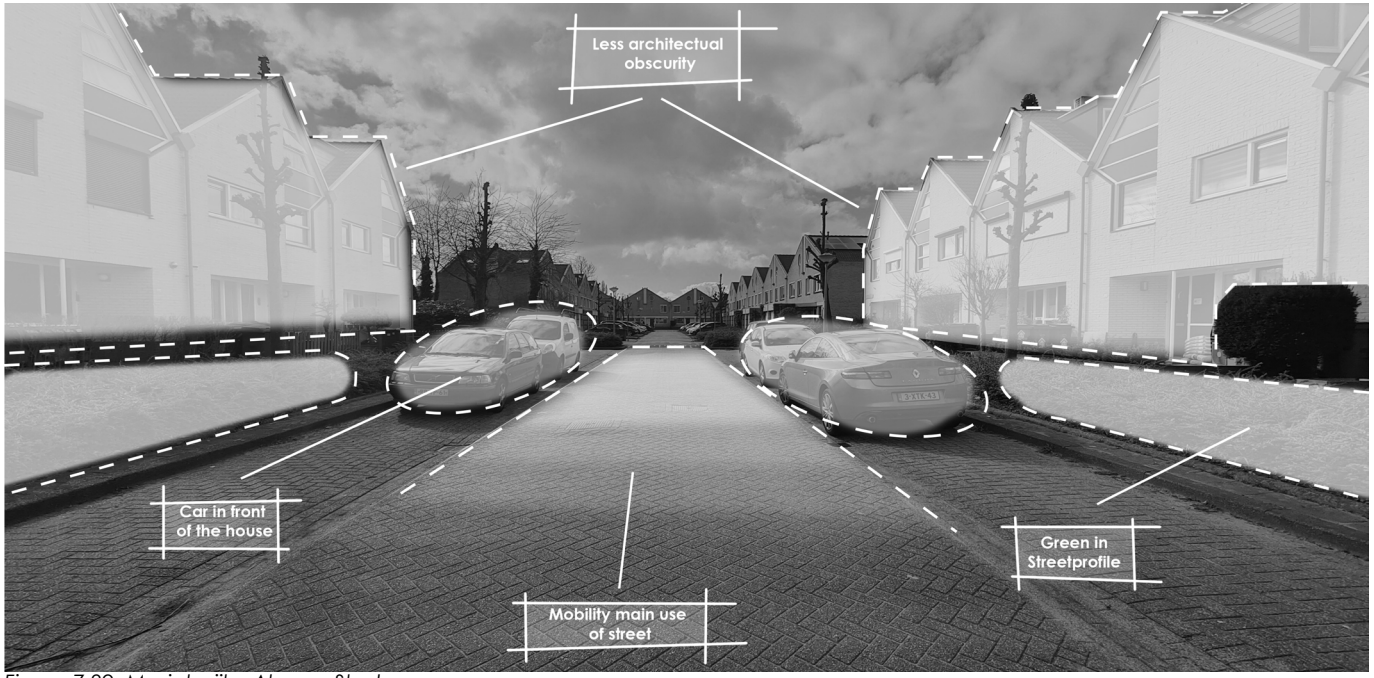


Figure 7.29: Muziekwijk - Almere-Stad


Figure 7.30


Figure 7.31


Figure 7.32


Figure 7.33

Current public space

Collective spaces, like parks and playgrounds are strategically placed in the neighbourhood.The green spaces in the neighbourhood are often covred with grass with a few trees. However, these green patches are very monocultural and lack biodiversity. In addition, the tendency of segregration for these green patches arises in the future of this neighbourhood.

The streets within the neighbourhood are often shared by both bikes and cars. This is the reason for the maximum speed of 30 kph for cars. The neighborhood is enclosed via one connection to a 50 kph road which is connected to a regional road located north of the neighbourhood. There is only one separate cycling path in the neighbourhood which is directed towards the north.

The majority of the housing are owner-occupied homes, this means a large part of the neighbourhood is private land. Most of the public space in the neighbourhood are streets while there the focus of parks are only at the edges (north and east) of the neighbourhood.

Figure 7.34:

Figure 7.35:

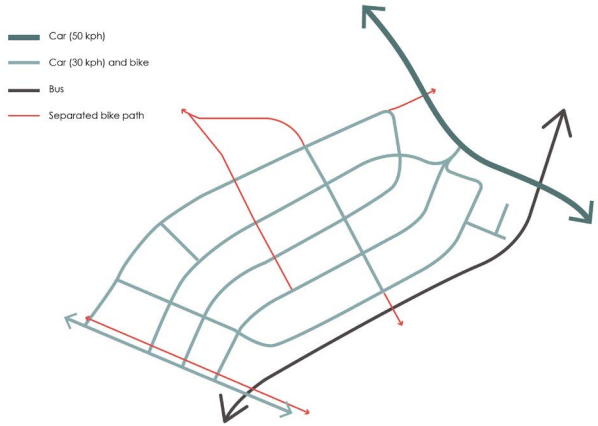


Figure 7.36: Infrastructure networks

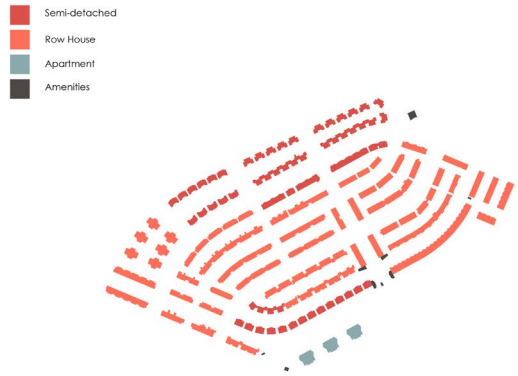


Figure 7.37: Morphology and arrangment of housing

Figure 7.38: Green networks

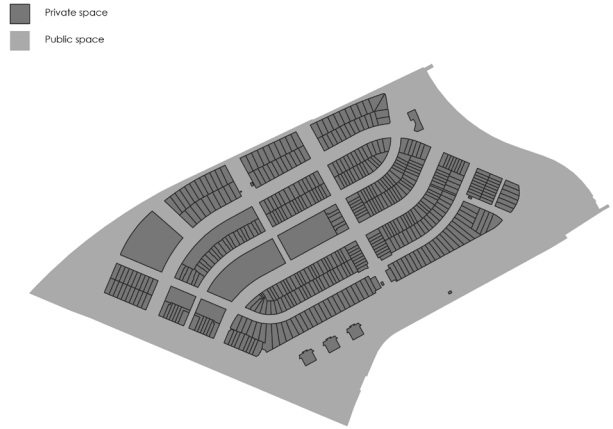


Figure 7.39: Cadastral map Public/Private space

Design principles and potentials

The current urban environment has significant potential to densify and diversify. The edges of the neighbourhood offer great potential to add additional volumes to create more space for housing and amenities. However, this is at the expense of green space. As identified in the previous page, these green spaces need an increase in quality and biodiversity. Because of this, the areas should strategically enhance the green space and as identified in chapter five, increase the quality over quantity, like Haaland & Konijnendijk (2015), Zhang et al. (2017), and Russo & Cirella (2018) identify. This will be combined to the enhancement of the green network. The existing green in the streetprofile of the neighbourhood offer these opportunities. As identified, the green patches in the streetprofiles are often monocultural. Increasing biodiversity here is an important tool to use.

Unfortunately, not every building is suitable for expanding or topping up. To determine this, typology, roof and free space near the houses were examined. Figure 7.42 identified that the majority of the semi-detached houses near the edge of the city. These houses are not suitable for expanding or topping up. This also applies to the apartment buildings south of the neighbourhood. Back-to-back dwellings (left) and row houses with the typology of sem-detached (right) have moderate potential. The other buildings have a high potential of using this tool.

The main routes used for cars are orientated only east-west, while cycling routes are both east-west and north-south. This creates the potential of placing amenities in strategic places along the cycling network.

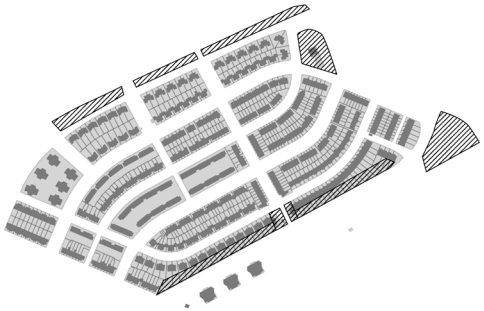


Figure 7.40: Potential areas to add volumes

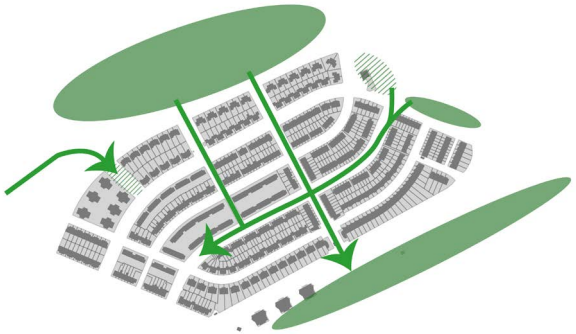


Figure 7.41: Enhancing green connections and networks

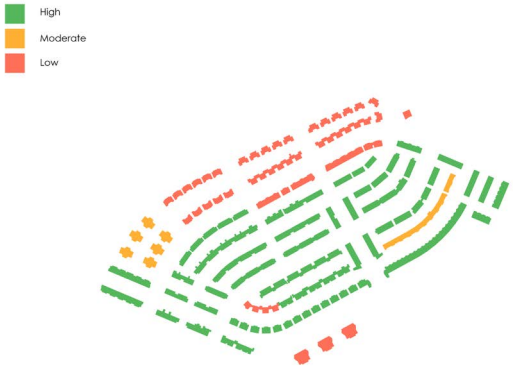


Figure 7.42: Potentials buildings for expanding/topping up

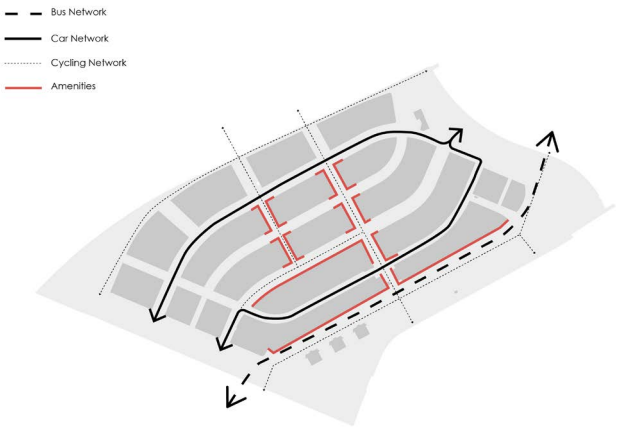


Figure 7.43: Routes and amenities potential

In the current situation, the bus infrastructure is located at the back of the dwellings in the south and is seggregated from the neighbourhood. This infrastructure is located near a cycling bath and a green zone along water. The adding of amenities next to this infrastructure, creates the potential of a better utilisation of the existing qualities of the green network on the city scale. This creates a high public transport network (in Dutch: H-OV) throughout the city. The situating of amenities to alternative transport implies to the increase of use of alternative mobility in the redesigned neighbourhood and city.

Minimal density

To better understand the implications of the implementation, various densifying scenarios will be descussed. The minimal densification scenario only assumes adding volumes in the edges and minimal effort for restructuring the southern blocks. This scenario will therefore maintain a low density. This scenario can also be seen as a first step towards the densification of this neighbourhood.

The adding of volumes near the neighbourhood edge (Block A-D) and precision interventions in block E together will be able to add 575 people distributed over 225 dwellings. The restructuring of block 16 and 17 will ensure a doubling of the population in these blocks.

These interventions has the opportunity of adding 1228 people in the neighbourhood distributed over 477 dwellings and therefore create a density of 1,6 times the original density. The exact calculations can be found in the Appendix.

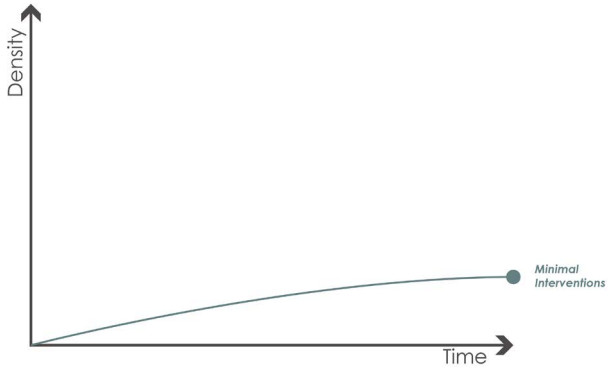


Figure 7.44: Density plotted against Time in minimal variant

Figure 7.45: Used tools in the minimal design

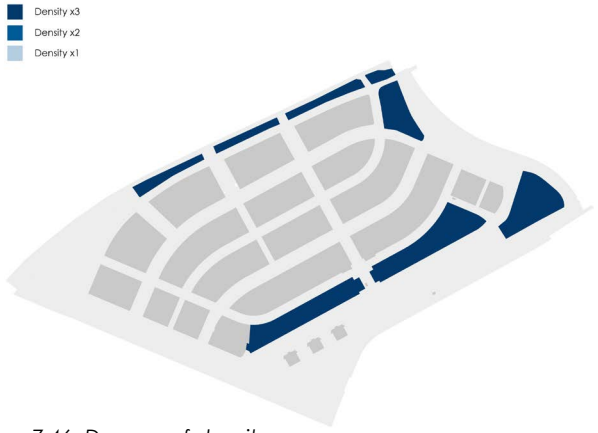


Figure 7.46: Degree of density

Figure 7.46: Added population and dwellings

Maximum density

It is good to understand the maximum potential of density the neighbourhood as well. This shows the maximum amount of people that can be accommodated in this neighbourhood. This will be simulated to restructure the urban blocks where the potential of densifying is lowest and use in the entire neighbourhood the High Density intervention tool for splitting, expanding and topping up.

According to calculations, the majority of new dwellings and increases in population were brought about by the usage of the splitting, expanding, and topping up tool. The intervention's optimal outcome is the creation of 950 homes for a total population of 2455. The neighbourhood edge and precision intervention tool add 252 dwellings that distribute 644 people. Restructuring of the urban blocks can house 1491 people and create 583 dwellings. Buildings similar to the High Density Intervention buildings were employed in the calculation of blocks 2, 3, 4, and 5. Calculations in blocks 16 and 17 were concentrated on volume addition and the typical living area a person utilises. The value chosen was 31 m2.

In total, this strategy is able to add 4590 people to the neighbourhood. This is a density increase of 3,4 times the current amount. The exact calculations can be found in the Appendix.

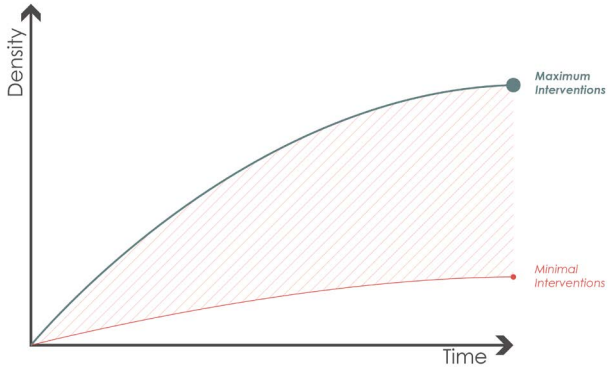


Figure 7.47: Density plotted against Time in maximum variant

Figure 7.48: Used tools in the maximum design

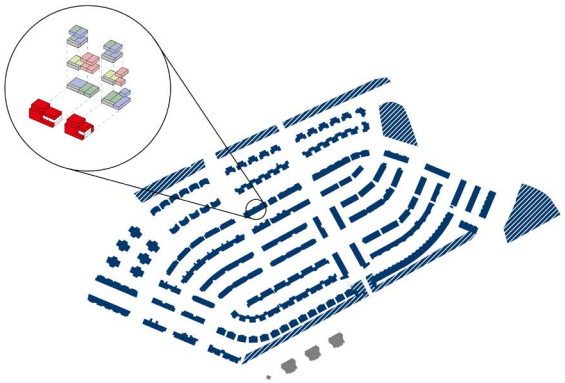


Figure 7.49: Degree of density

Figure 7.50: Added population and dwellings

Networks and Public Space

The public space will play a important role in the redesign of this neighbourhood. The design of the public space in this neighbourhood is focused on the decrease of space used by cars. For this reason some, but not all, of the roads will become car free, while others will aimed more towards other forms of transport instead of mainly focused on car-use. The neighbourhood will therefore not be completely car free but it will be aimed towards low-traffic. The design will assume a new hierarchy of roads. The foundation of the assigning of the redesigning is aimed to enhance networks. More important are the bike- and bus networks. The car network less important. This new hierarchy is reflected in the public space design. The design assumes new types of public space, combined with bike infrastructure, which is focused on bringing nature in the city on the scale of the street. This will make streets important in adding more green to the city. The sections on the next page will give more information about the new public space network. In addition to the public streets, green will also increase within the urban blocks. As the interventions, seen in the previous subchapter, are more focused on comunity gardens and spaces, accessible and diverse green will increase within the neighbourhood.

Figure 7.51: Functions of public space

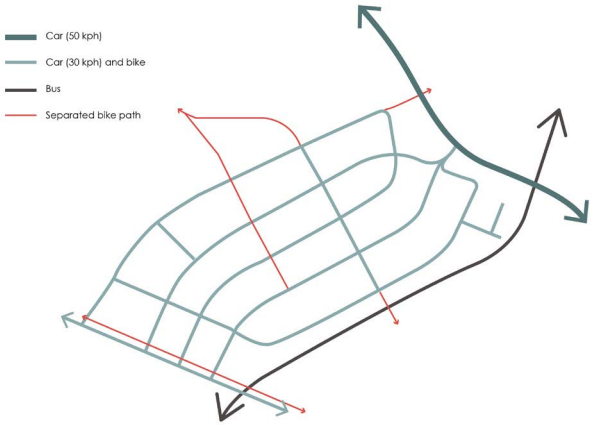


Figure 7.52: Current road network

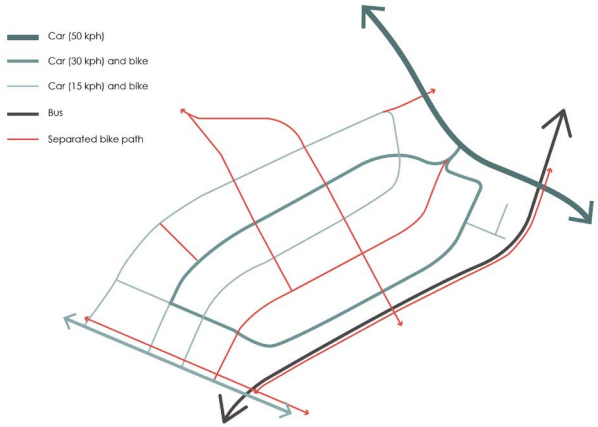


Figure 7.53: Proposed road network

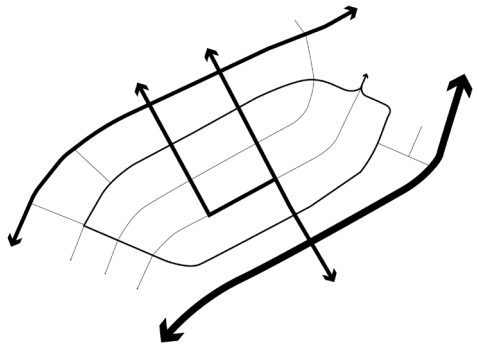


Figure 7.54: Hierarchy and importance of roads

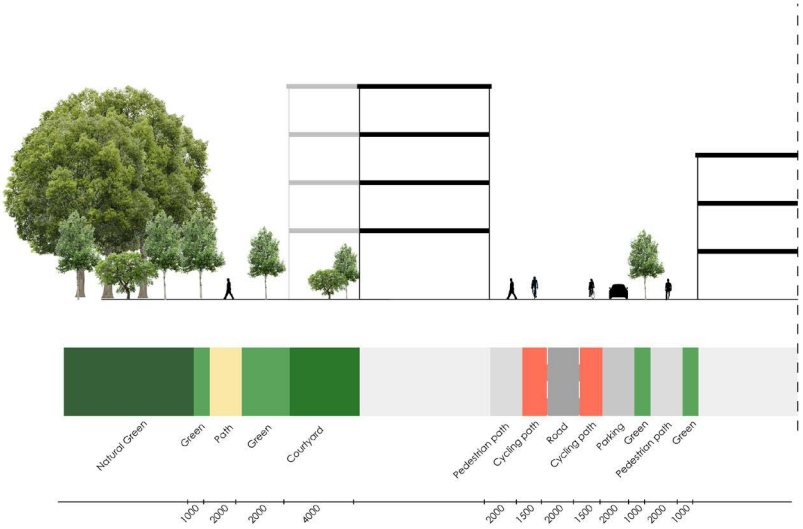


Figure 7.55: Section A: transition towards nature and the focus on bike instead of cars in the streetprofile

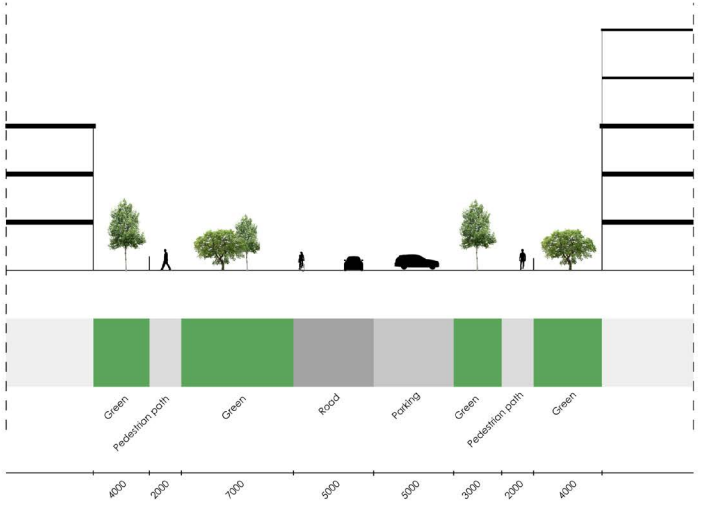


Figure 7.56: Section B

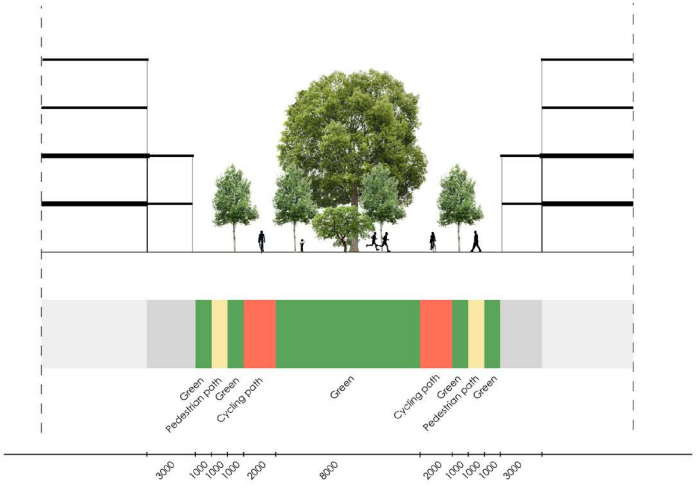


Figure 7.57: Section C

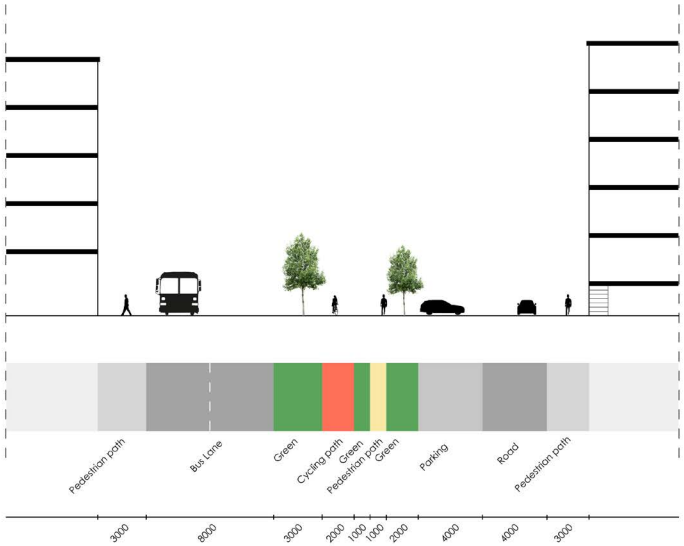


Figure 7.58: Section D

Networks and Amenities

The networks in the neighbourhood are the foundation for the positioning of amenities, just like they do for the public space typologies. In the network, bicycles and public transport will be more important than cars. This is also reflected in where the amenities are positioned. The most essential amenities, on a city scale, must be close to the bus infrastructure. Amenities that are significant on a neighbourhood level will be located along cycling infrastructure. This shows the hierarchy of the networks also influence the hierarchy of the public space and amenities.

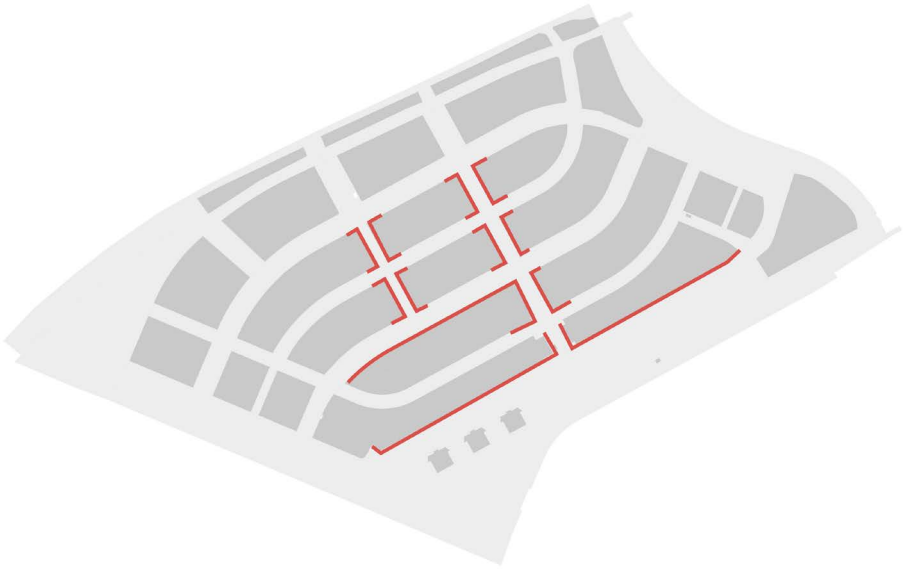


Figure 7.59: Positions for amenities

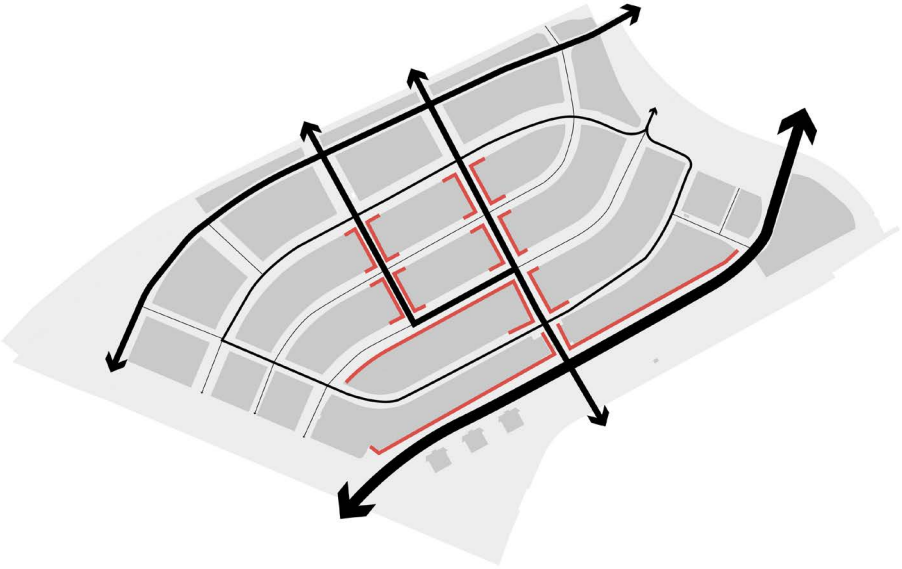


Figure 7.60: Amenities connected to the more important networks

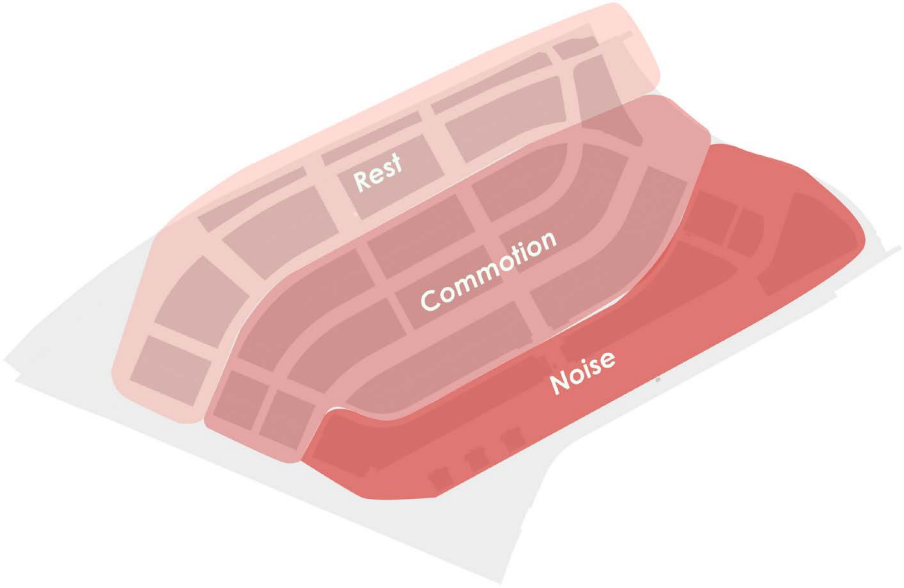


Figure 7.61: rest-commotion-noise underline the positioning of the amenities

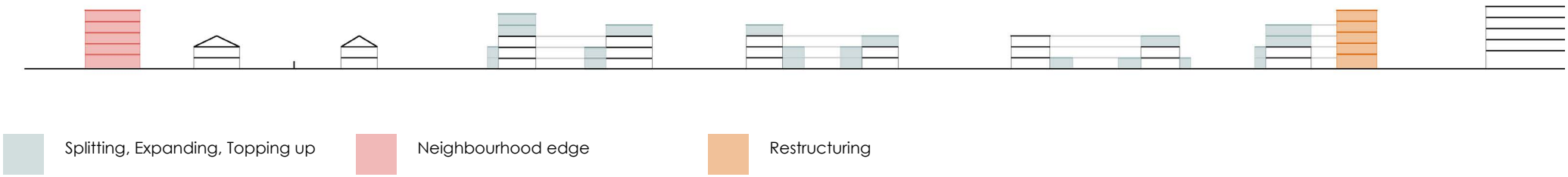


Figure 7.62: Implementation of tools in section

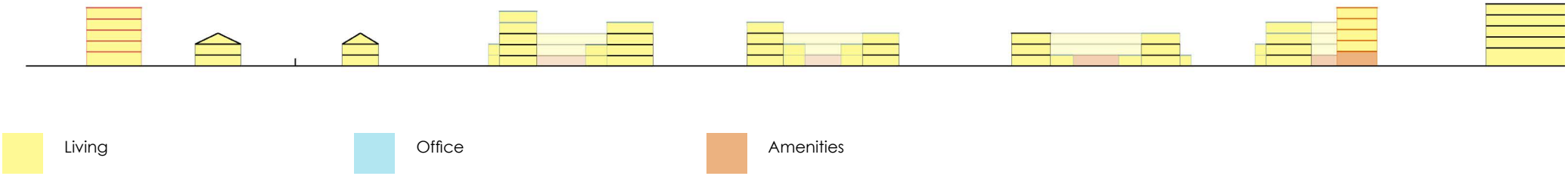


Figure 7.63: Functions

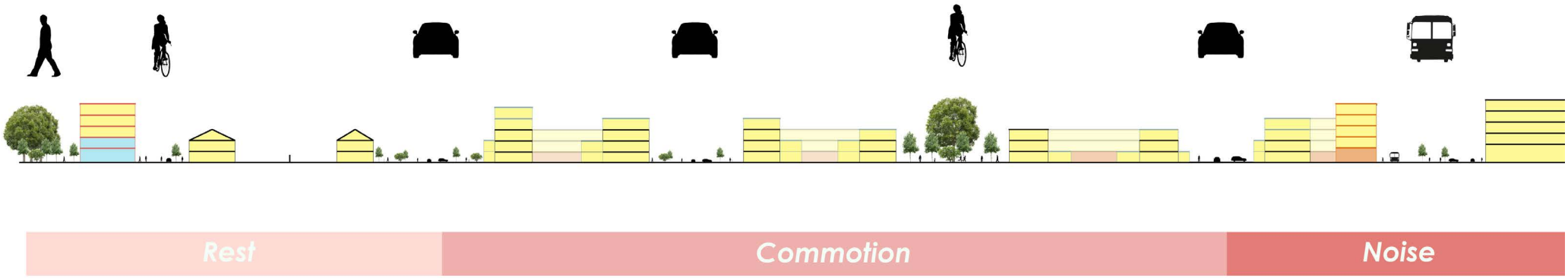


Figure 7.64: rest-commotion-noise

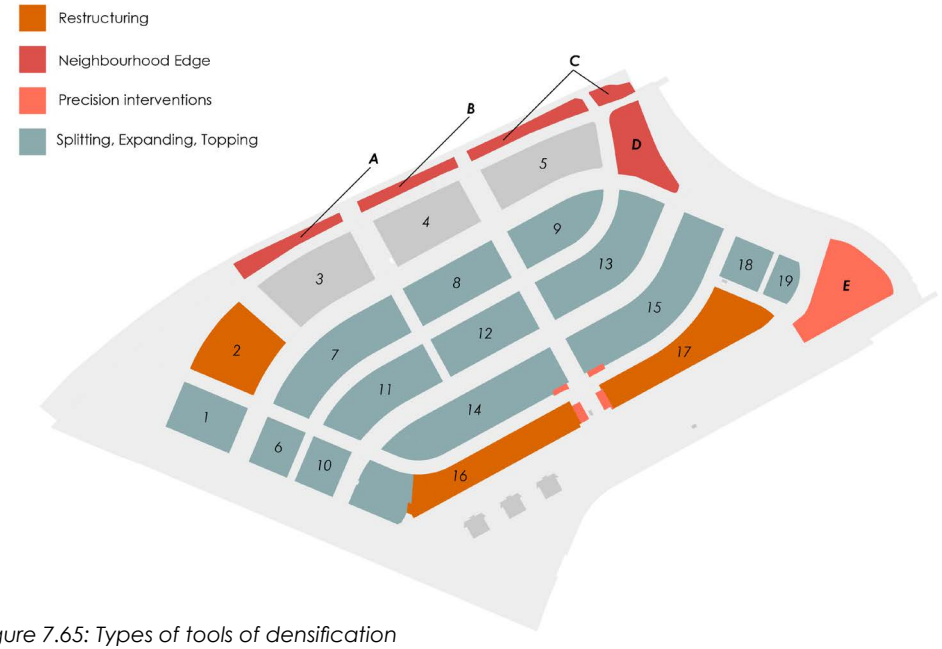


Figure 7.65: Types of tools of densification

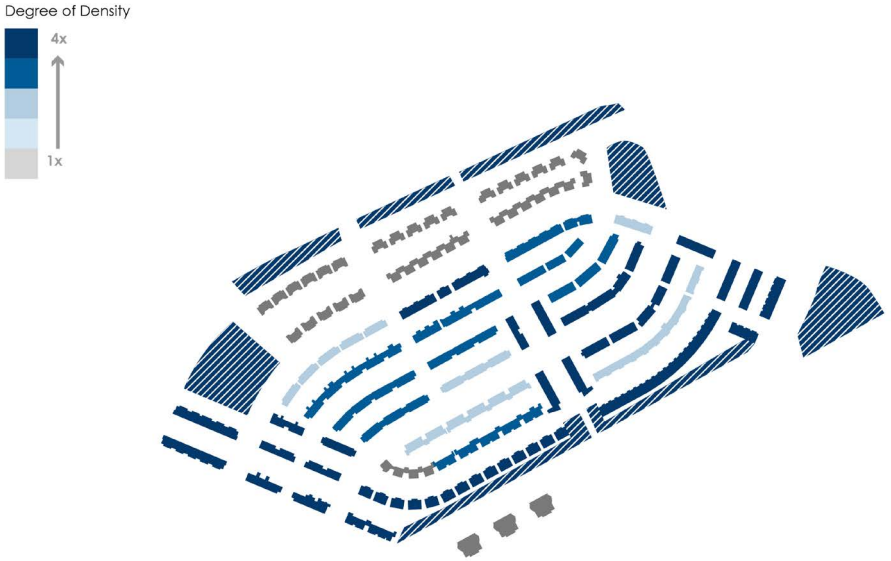


Figure 7.66: Potential degree of density on buildings

Densification

Densification will be justified based on the networks of public space, amenities, and infrastructure. In line with the vision, the densification strategy seeks to at least quadruple the number of residents in this neighbourhood. The aim of the densification strategy is to make the housing stock more suitable for the changing demographics. As the potentials point out, volumes will be placed near the edge of the neighbourhood. The impact of the volumes on the greenery, to adapt to climate change for example, should be minimal. The new concept of the public space, which empasizes the addition of green in new public space designs, justifies the placement of volumes in currently underutilised green spaces.

Therefore, along the northern edges of the neighbourhood, the tool of neighbourhood edges will be used. Great profit can be made here in terms of adding dwellings. The southern part will be restructured. The current buildings are not suitable for the future functions necessary in this area. The importance of this part on the city scale justifies this. Last but not least, in the middle part of the neighbourhood the tool Splitting, Expanding and Topping Up will be used to accommodate the remaining dwellings necessary to densify the neighbourhood four times.

Playing rules

It is important to prevent unbridgeable differences between the new and old urban blocks. They must connect to each other. Different playing rules for the new urban blocks can lead this in the right direction. The preservation of the suburban qualities in a higher density is achieved through an intensive mixing of higher and lower buildings as well as the retreating of higher facades. (Broekman et al., 2020; Gemeente Houten, 2020). This is why playing rules have been drawn up to guarantee and strengthen the spatial quality. A zoom in in different areas of importance, the northern and southern end of the plan, will also implement site specific playing rules.

Not one continuous volume

Variation in height

Upwards step-by-step

Sidelines to courtyards

Open plinths

Neighbourhood edge

The main playing rule in this location is to maintain the connection between nature and the urban environment. In addition to this, and maybe more importantly, is to also improve the current connections. Another playing rule is to keep the concept of the zoning of the neighbourhood in mind. Therefore, it is important to adapt to the function of rest in this area. This is already expressed in the fact that amenities are not located here. To enhance this, the density of this area will increase to two to three times. By not raising the density too much, the rest is preserved. This means, a porous urban form is needed in this area.

The plan shows these requirements are possible to implement in the area. To example this, the blocks, discussed in the previous subchapter, are used. These blocks are very suitable to maintain the suburban qualities in the area.

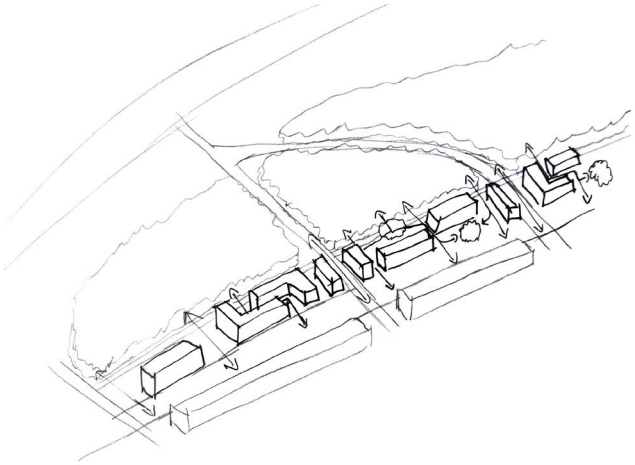


Figure 7.72: Maintaining, increasing and improving connections with the placement of functions

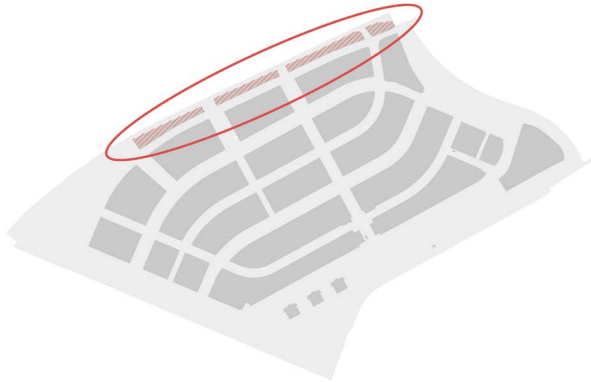


Figure 7.73: Area of focus

Figure 7.74: Current underutilised green space

Figure 7.75: Current underutilised green space

Materials and transition

The street is assigned as a cycling street. The main function of the street is creating pleasant and enjoyable ride for cyclists. The housing next to this street requires car connection as well. This is possible in a cycling street as well however, cars are guests on this road and follow the lead of the cyclists. Pavement in the middle of the road are raised and thus provide more safety when overtaking cyclists and ensure that cars cannot go too fast. The bicycle street is mainly asphalted to make it as comfortable as possible for cyclists.

Figure 7.76: Example of materials in Fietsstraat

Figure 7.77: Impression cycling through green (Gemeente Houten, 2020)

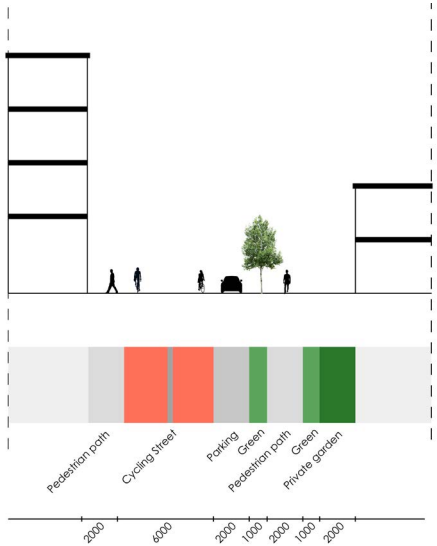


Figure 7.78: Streetprofile

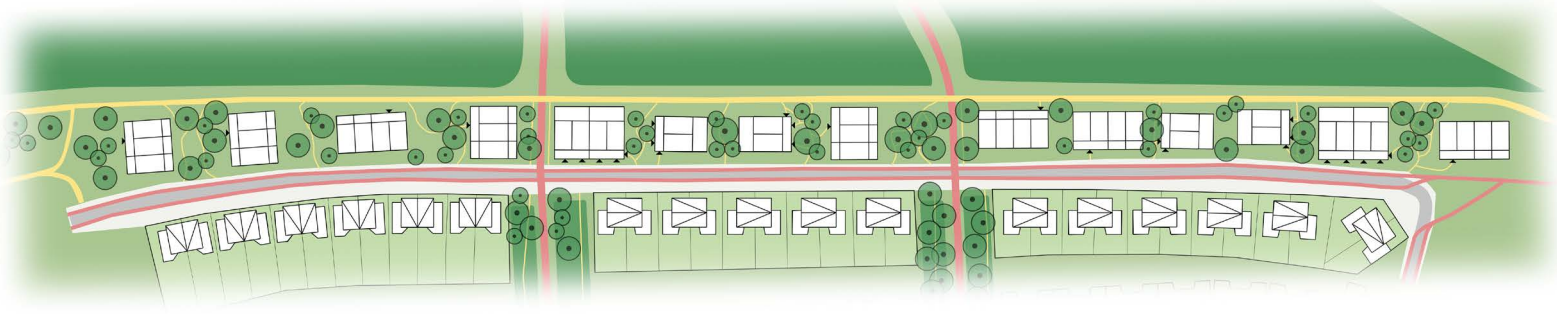


Figure 7.79: The added urban blocks in the plan

Figure 7.80: Impression of sightlines to nature

Figure 7.81: Impression of densification that ensures utilising of nature

Restructuring for High-Quality Public Transport

The southern part of the neighbourhood should enhance the connection between amenities and public transport. The current situation shows that the bus infrastructure is seggregated. In this particular area, the backyards of the dwelings are located towards the bus infrastructure. Situating the bus infrastructure at the back side of the urban blocks.

In the proposed design, urban blocks will be placed facing the bus infrastructure. To increase and improve this connection, the road in front of the amenities in the added volumes will be accesible only for bikes and bus. Therefore, it is important to identify how the connection and transition between these two functions will be established. The scale of the urban blocks will increase in this area, resulting in higher buildings. This is underlined by the design tool noise-commotion-rest. Therefore, the design of this location should also think about the connection and transition of these urban blocks towards the surrounding neighbourhood.

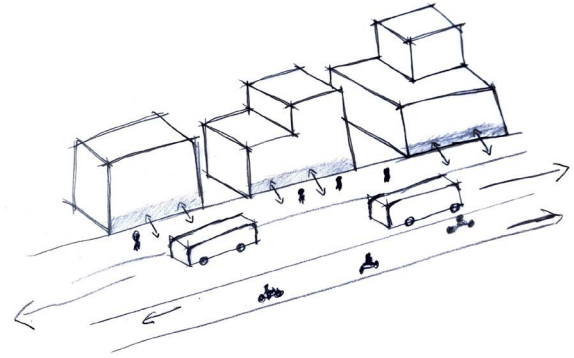


Figure 7.82: Plinths with amenities in close connection to High-Quality Transport

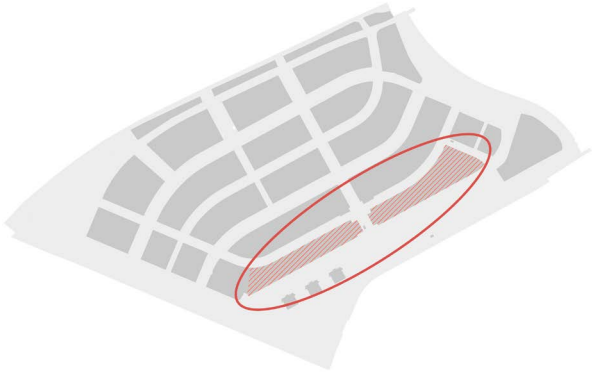


Figure 7.83: Area of focus

Figure 7.84: Current situation bus infrastructure

Figure 7.85: Bus infrastructure seggregated from amenities

Restructuring for High-Quality Public Transport

The southern part of the neighbourhood should enhance the connection between amenities and public transport. The current situation shows that the bus infrastructure is seggregated from the other spaces. In this particular area, the backyards of the housing are located here. making the bus infrastructure the backside of the urban blocks.

In the proposed design, urban bloks will be places facing the bus infrastructure.

To increase and improve this connection, the road in front of the amenities in the added volumes will be accesible only for bike and bus. Therefore, it is important to identify how the connection and trnsition between these two functions will be established.

Adding of volumes here is possible because on the second urban block (blocks 14 and 15) densification in the form of splitting, expanding and topping up will be applied using the High Density Interventions which can function as a transition towards the commotion part of the neighbourhood and a prelude towards the transition to the rest part. The volumes are added on the basis of the playing rules. An average living space surface area a person utilises was used to calculate the the possible amount of residents in the buildings. The value chosen was 36 m2. This will enable 123 and 162 persons, respectively, by adding about 300 people to block 16 and about 400 to block 17.

Figure 7.86: Reference image Bus only street (Gemeente Houten, 2020)

Figure 7.87: Reference image Europalaan Utrecht

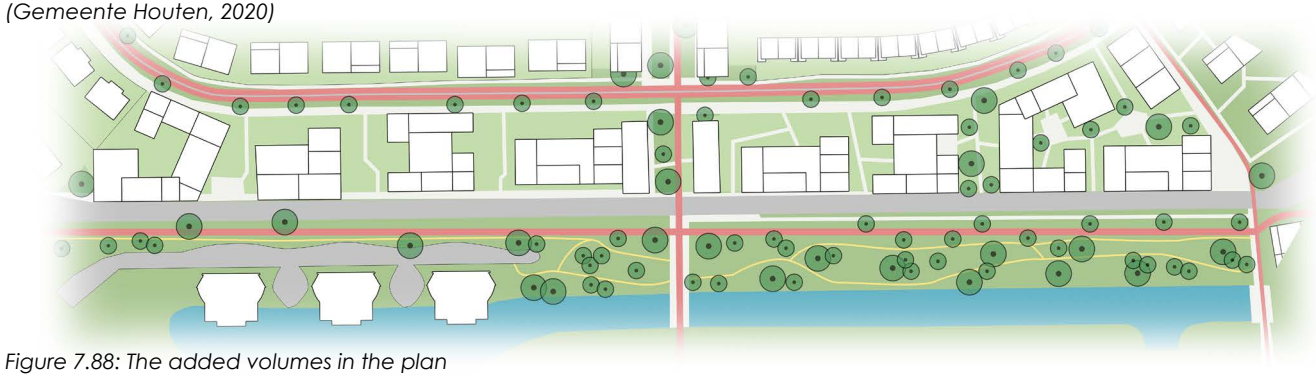


Figure 7.88: The added volumes in the plan

Figure 7.89: Impression of densification ensures utilising nature

Amenities

The design of the neighbourhood enables a total surface area of 13743 m2 for amenities. These surface areas are situated in blocks 8, 9, 12, 13, 14, 15, 16 and 17. Due to the increase of population, social-cultural amenities need to be added. This is done in the form of a school, pharmacy, general practitioner and a youth center (Gemeente Amsterdam, 2018; Gemeente Den Haag, 2021). The importance of the bus infrastructure is highlighted here because these amenities are situated along this infrastructure. To create proximity to work, offices will also be placed in the neighbourhood. These are also mainly situated along the bus infrastructure to force people to use different mobilities. The amenities in the middle of the neighbourhood are more focused on the neighbourhood scale. these have the opportunity to be small stores or other retail. This shows that the importance of the infrastructure is also connected to the scales of the amenities. In turn, this enables the rest-commotion-noise indications for a layered design in the neighbourhood.

	Block 8	Block 9	Block 12	Block 13	Block 14	Block 15	Block 16	Block 17	Total
Surface Area (m2)	160	160	320	320	320	160	6123	6176	13743
School								3770	3770
Pharmacy		82							82
General Practitioner		82							82
Disco								684	684
Youth Center								109	109
Supermarket							4000		4000
Retail	160		160	80	160		1000		1560
Catering				80			500		580
Office					160	160	500	1613	2433
Flexible			160	160			123		443

Table 7.90: Distribution of amenities per block

Figure 7.91: Isometric view location amenities

Assessing the design

The design shows a layered approach towards densification. From the prioritation of the networks, a new public space was designed. This public space focused more on bike- and pedestrian oriented designs instead of car oriented. The networks in combination with the infrastructure determined the placement of the amenities. This created a zoning of amenities and functions in the neighbourhood. Significant locations that were categorised as being in the noise zone were primarily connected to the bus infrastructure. This also brings importance on the city scale. Upon this, the degree of densification was determined. This created a more dense population near the bus infrastructure and less density, combined with more preservation of current dwellings, in the rest zone.

Interestingly, the overall density of the neighbourhood will not be significantly affected by these implementations. With the help of these interventions, the density x3 that the previous chapter identified as being necessary to achieve the objective (of increasing the population of Almere by 200.000) can be attained. The design shows a beneficial impact on effective use of space. This is shown in the surface space that people use to live and space of public greenery per capita. The design only has 11% less population but 27% more green space per capita. Compared to the current situation, the design increases the population by 300%, while still maintaining 56% of the public green space per capita. Showing that densification is more effective in terms of space use compared to the Row House Paradigm.

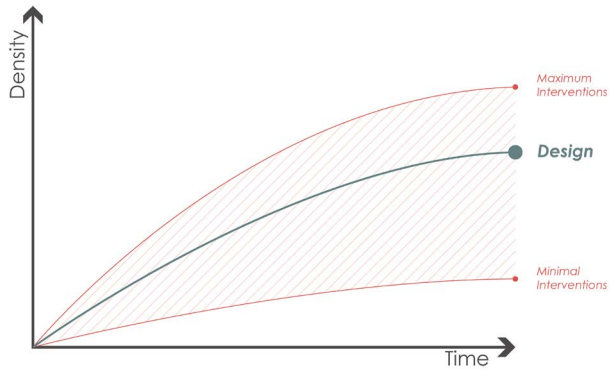


Figure 7.92: Density plotted against Time in design variant

Figure 7.93: Distribution of density

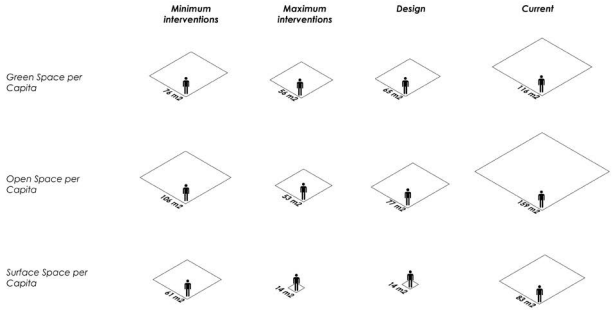


Figure 7.94: Different space uses per scenario

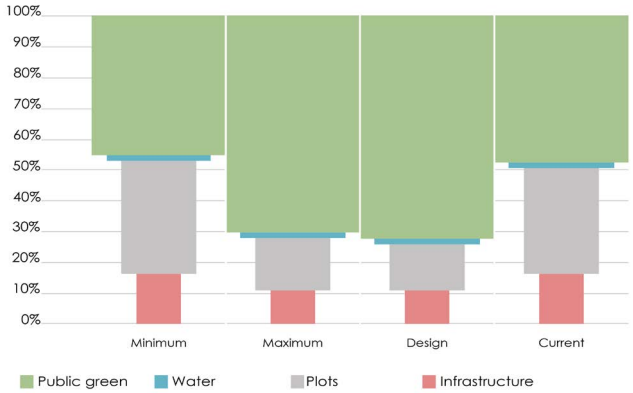


Figure 7.95: Space use per scenario

Figure 7.96: Isometric Muziekwijk-Noord

Block	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	A	B	C	D	E		
Dwellings (3)	4	0	2	2	2	0	3	6	4	0	2	2	12	0	8	2	0	6	2	2	2	4	4	3		
Density x1			2	2	2				2				2			2										
Density x1,5																										
Density x2							1	6	2		1	1								2	2	2	2			
Density x3	4						2				1	1	10		8			6	2			2	2	3		
Dwellings (4)	2	6	4	4	5	4	9	3	4	4	7	6	4	15	10	13	18	0	0	2	4	3	3	2		
Density x1			4	4	5			3	2					2	5									10		
Density x1,5																										
Density x2							4		2		3	3		11	1					1	1					
Density x3	2	6				4	5			4	4	3	4	2	4	13	18			1	3	3	3	2	Total	Density
Total Dwellings	50	54	22	22	26	36	99	48	42	36	74	65	122	114	128	123	162	48	16	29	47	55	55	42	1585	x2,8
Total Population	130	138	53	53	62	92	261	125	110	92	195	172	316	307	330	314	414	126	42	77	123	143	143	109	4094	x3,0

Table 7.97: Added population and dwellings

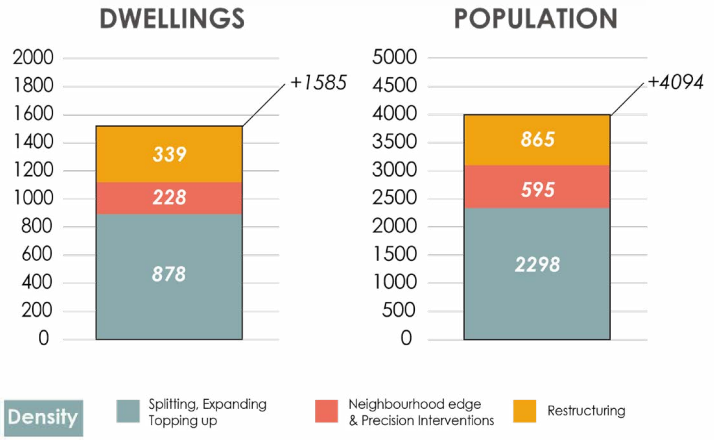


Figure 7.98: Added population and dwellings

Economic Benefits

A combination of expanding, topping up and splitting are necessary to achieve more suitable housing in the urban environment. Expanding is approximately € 2000,- (Bouwkostenadvies, 2022), while topping up is more expansive around € 2500,- (Bouwkostenadvies, 2022). The calculations of the Low- and High density interventions show that cheaper houses can be constructed. The current average WOZ-waarde (Home value) in Almere is € 249.000,- (Alle Cijfers, 2023). The calculations use € 310.000,- as the WOZ-Waarde of the dwellings because this is the average in the two previous neighbourhoods (Alle Cijfers, 2023).

For homeowners and new residents

To achieve this transition in Almere is challenging. This is because 64% of Almere's housing stock is owner-occupied (CBS in uw buurt, 2019). This makes these interventions harder to implement. The current residents are the owner of their home and therefore what happens to it. The desire to remain and live in the current location is held by 63% of the households (Stuart-Fox et al., 2022). This demonstrates that residents are not motivated to move to a different type of residence. Many residents are conservative and oppose change (Hemel, 2022). It is important to try to move residents to take change in their own hands. According to Van Klaveren et al. (2021), this can be done to identify economic benefits and to remove obstacles for them to get involved and help the transition. Obstacles are often caused by regulations and laws. That is why these will be discussed in the following paragraph about the benefits for the municipality. The Low- and High Density intervention show a more expansive price per surface area. However, because this can be divided into more units, the price of a dwelling is lower and creates more suitable and affordable dwellings in the proces. This is especially for aimed towards those households (one-person or elderly) that cannot find a suitable home because they cannot lend the large amount of money necessary. In these interventions, subsidies by the municipality can close the gap of money necessary to convince the existing residents to implement this change. The following paragraph wil explain this further.The calculations demonstrate that it is possible to generate economic benefits for the current population. The WOZ-value of the new dwellings the existing population will use in the future (Dwelling 2) does not change. A deficit of € 126.000,-, in total, is produced by the sale of Dwelling 1, which can be divided among the three dwellings' current occupants. resulting in two things: an economic benefit for current residents and less expensive dwellings for new residents.

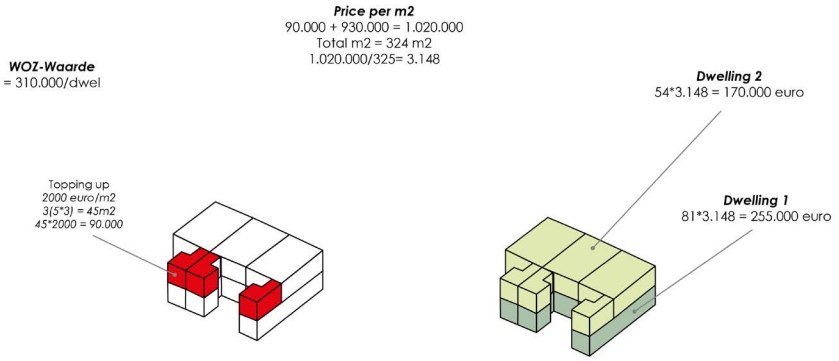


Figure 7.99: Economic calculations Low Density Interventions

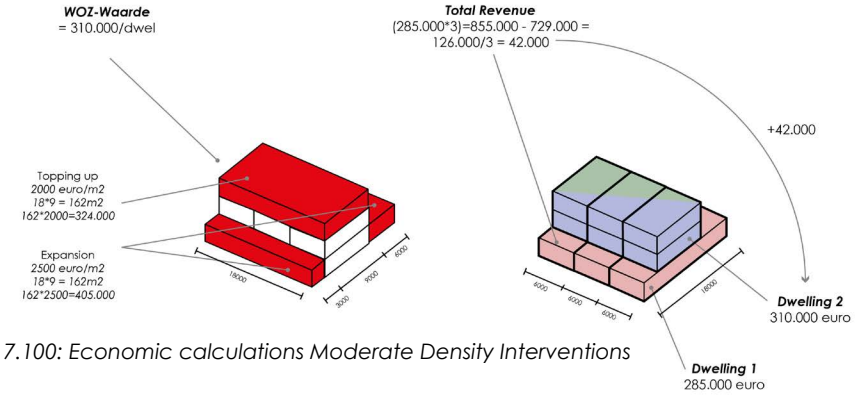


Figure 7.100: Economic calculations Moderate Density Interventions

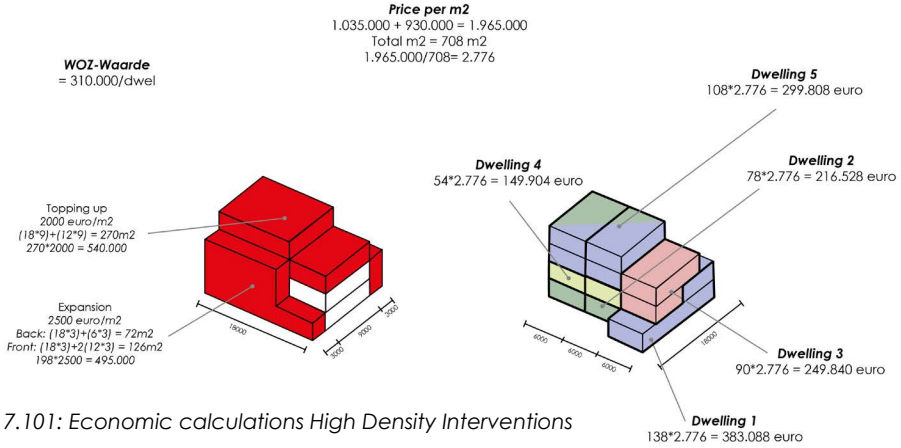


Figure 7.101: Economic calculations High Density Interventions

Economic Benefits for the municipality

The statement that densification is cheaper than expansion is true. This is what Decisio & Metafoor (2023) investigated. Constructing dwellings in expansion projects is often more expensive for a governmental agency, it also generates far less social benefits than densification. The higher costs for developing homes outside the city limits are mainly caused by the 'above-plan costs' (site preparation, infrastructure). These must be made, among other things, to locations accesible through various networks (roads, sewer, cables and pipes). This also increases the periodic costs done by the municipality. The management and maintenance costs for the expanded urban area are an addition to the current costs of the current urban area.

Removing difficulties

Also the municipality has influence on the succes of the implementation of the given densification strategy. Municipalities often oppose this type of densification.

The municipalities refer to the parking policy (Van Klaveren et al., 2021). More intensive habitation can lead to exceeding parking standards (Van Klaveren et al., 2021). However, this strategy assumes a decrease in car-use. In this way, people can be forced to use other modes of transport and with the combination of he location of amenities close to public transport, enhances this. Municipalities implemented policies against splitting and sharing dwellings due to concerns about quality of life (Van Klaveren et al., 2021). Gemeente Almere also made policies aimed to this. The design showed that the implementation of splitting and sharing needs to be done in combination with an redevelopment of the public space. In this way, quality of live, the values in the urban environment, can be maintained. Also, investors (public or private)aim for the quantitative financial returns rather than qualitative social returns (Van Klaveren et al., 2021). In this day and era, it is important to try to aim for qualitative social returns, which are much more important than finencial returns.

8.

THE CONCLUSIONS

Anwsering the Research Question

Conceptual background

1. What is the Row House Paradigm in the Dutch context?

The problem analysis identified the existence of the Row House Paradigm, especially in the Netherlands. The tradition of building single-family homes in expansion and densification projects is the main reason for its existence with the emphasis on the word 'tradition', which both Thomas Kuhn and the Cambridge Dictionary use to describe the concept of a paradigm. The Row House Paradigm is about forcing upon the population a certain lifestyle regardless of background and economic status. In post-war Netherlands, this was received as luxury and the start of a new age. However, throughout the years, various urgencies started to emerge. This resulted in the questioning of our current living standards by this thesis. The space the Dutch population uses to live grew to five fold in 70 years, resulting in extensive urban sprawl in most of the Dutch cities. The distance between life, work and recreation grew, supported by the spatial planning of the Dutch government. This paved the way for the creation of Almere and the next phase of the thesis. With space shortage in the Netherlands, climate change and a changing demographic the Row House Paradigm in the Netherlands is under pressure.

Analysis

2. What are, currently and at the time of its founding, the main design principles and qualities of Almere?

Almere was constructed using the principles of the Garden City concept by Ebenezer Howard. Increasing the amount of green space available in cities was the main idea behind this concept. The placement of various cores would be done in combination with green 'skegs' separating the cores, making the positioning of the green structure more important than the urban environment. The cores would be linked to the primary core where amenities are located. This is precisely what is visible in Almere. The purpose of this was to improve liveability. This applies in particularly to Almere, which is envisioned as a *"Woonstad"* (living city), with a primary focus on living. This is amplified by the use of low density row houses. Leading to an suburban city with urban sprawl. However, The suburban qualities have developed over time and are very much appreciated. They also help to improve quality of life. This results, together with the green identity and public transport dispersion, in the strengths of the city.

3. What techniques and guidelines for Urban Retrofitting could be gathered to be implemented in the urban environment?

The work done by KAW Architects was at the start in identifying the tools needed for densifying and diversifying the existing urban environment. The search for left-over spaces, such as retreating car infrastructure, had a lot of possibilities to densify suburban neighbourhoods. More importantly was the way of splitting, expanding and topping up existing dwellings. In combination with research done by Platform31, two types of splitting dwellings was identified. One being sharing dwellings possible with a few simple interventions, resulting in 'soft' measures. Secondly, splitting dwellings on a constructional level, resulting in 'hard' measures and different ownerships of land. Also, KAW Architects identify that there is a lot of opportunity in suburban neighbourhoods to add volumes in left-over spaces. A lot of volumes may also be placed in transition zones between the city's outer perimeter or infrastructure and the suburban areas.

As the Board of Advisors identify, densifying and diversifying the urban environment is not only constructing dwellings. Effectively re-ordering the public space and strategically positioning amenities is indispensable in this matter. The surface area of green is reduced as a result of building volumes in the leftover and transitional areas between suburban neighbourhoods and green spaces. Rearranging urban blocks and choosing a bike over a car are two ways to while lowering the quantity improve the quality.

In order to place amenities, it is also crucial to combine green networks with infrastructural networks. the placement of amenities in the living space that are appropriate for it, is a strategy. The creation of distinct zones in the neighbourhood for various purposes and the addition of amenities on various scales and dimensions contribute to the diversification of the urban environment.

Design Strategy

4. How are the urgencies of the Row House Paradigm expressed in Almere?

The urgencies of the Row House Paradigm are expressed in the values of the urban environment and the lifestyles by the population of Almere.

The results of the weaknesses and threats of the SWOT-Analysis are focused on this sub question. The current urban sprawl is one of the most important weaknesses of the city and is the foundation of other weaknesses. The urban sprawl, caused by the low density urban fabric, cause functional segregation. A separation of amenities, living and work. This causes increased traffic activities within the city, making car-use the dominant way of transport in the city. This is enhanced by the regional position of Almere. The dependence on Amsterdam ensures an imbalance in commute. While there are many jobs in Almere, one commutes to Amsterdam for employment. The city's weakness is a result of these problems. The treats apply to two factors. The disappearance of the current suburban qualities when densification is implemented in the city on the one side and the extensive urban sprawl, without the change of current approach, resulting in a housing stock that is unsuitable for the changing demography, on the other side.

5. How can the main design principles of Almere amplify the implementation of the techniques and guidelines for densification and diversification?

To answer this question, the opportunities of the SWOT-analysis are of interest in combination with the strengths. The changing demographic gives the opportunity to diversify the housing stock and enhance the overall urban environment of Almere.

The Garden City concept ensured a large amount of green space in the city. However, as identified, these green spaces are often underutilised and lack quality and diversity. These spaces create a large opportunity to be densified to achieve a diverse and suitable housing stock. But as discovered, There must be guarded against a decrease in quality. Quantity of green space is possible if the quality of the existing green is increased and enhanced.

The current public transport system can be a carrier for densification. The city's highly segregated bus infrastructure, which is currently in place, can contribute to a decrease in car use. Almere's neighbourhood edges frequently combine this segregation with underutilised green space.

Implementation

6. What alteration of the city structure is able to improve, optimise, and establish the modifications necessary to adapt the urban environment?

An alteration of the city structure is necessary to intertwine all the interventions discussed in the previous sub questions, create unity in the city and—most importantly—help the municipality reach its goal to become the fifth city in the Netherlands. The new city structure needs to be able to counteract the limitations and urgencies of the Row House Paradigm on the city scale in Almere.

The design study in Chapter 6 suggests the implementation of a Ring Structure. This ring structure will enhance different elements on different components. Firstly, it will give direction to the city to double in size. The ring structure enables the use of left-over underutilised green spaces on the edge of the city. Using densification to enhance green quality and transition towards the surrounding natural landscape. Neighbourhoods within the ring structure have the opportunity to quadruple in size.

Secondly, amenities will be added in the Ring Structure. By doing this, in addition to the district centres, proximity to the city's suburban areas will be increased. This proximity will be amplified by the public transport infrastructure. The creation of High-Quality Public Transport in combination with amenities will drastically improve the connection of amenities.

Thirdly, the Ring Structure ensures an improved connection between different districts and offers the opportunity to unify the city's function as a single entity. Each district has their own center, character and identity with the threat of being segregated from each other. This threat will be reduced by the Ring Structure. It is important to recognise that the Ring Structure will not compete with the current urban centers in terms of amenities. The Ring Structure only focuses on mixing functions.

Main Research Question

How can the techniques and guidelines for densification and diversification be applied in an adaptive and alternative vision for Almere in order to identify the limitations and counter the urgencies the Row House Paradigm creates?

All of the sub questions are related to the main research question and contribute to its clarification and answer. The third research question identifies different techniques and guidelines for densification and diversification. These techniques and guidelines can be used as the tools for implementing a more diverse housing stock in Almere. In Almere, these techniques and guidelines are used as part of an alternative and adaptive design strategy.

The introduction of the Ring Structure provides a suggestion for structuring the implementation of the techniques and guidelines, which will assist the city as a whole. This develops an alternative and new perspective of Almere. The success of the implementation of the techniques and guidelines, however, is not dependent on how and if the Ring Structure is implemented. This is also the adaptive component of the design strategy. Existing and future urban developments are separate from the Ring Structure's implementation. The Ring Structure offers an adaptable approach for identifing and countering the limitations and urgencies of the Row House Paradigm in Almere.

The precondition for this thesis was to concentrate on the techniques and guidelines for preserving, enhancing, and emphasising the existing values of the urban environment of Almere while also allowing for new lifestyles in the urban environment that counter the urgencies the Row House Paradigm creates. The Ring Structure's design addresses this issue by focusing on existing suburban values while increasing proximity, providing alternative transportation options, and increasing density. In addition, the techniques and guidelines implement a more effective space use in terms of open space per capita, green space per capita and surface space per capita.

According to this Adaptive and Alternative vision, densification, which is depicted in this report in the form of ring structure, is able to meet the task and achieve the goal of adding 200.000 residents to the city. Therefore, only a small portion of the city needs to be modified to accommodate this increased density. It is crucial to note that the remainder of the existing city is preserved, keeping this area of the city suburban combined with its current green qualities and improve transit connections. This demonstrates that reaching the goal can be accomplished without expanding the city.

9.

REFLECTION

Reflection

The thesis's scope has improved and become more focused over time, which is pleasing. As a result, the thesis' societal relevance grew in significance. The thesis' initial emphasis was more on the possibilities that might be adaptive towards the end. However, this resulted in a final product not sharp enough, making the process, which was drawing to a close, more challenging. It was challenging to discover and adapt to this near the end.

The project will attempt to challenge the current standards of our way of life in the social context. The Row House Paradigm, which is extensively utilised in the Netherlands and Almere, appears to have reached its limitations. The paradigm brought in numerous economic advantages. It enabled people to live further from their work, improved health among residents by providing more access to green space, placed residents farther from the pollution of a busy inner city and encouraged individualism by allowing each household to have their own private space in the city.
The Row House Paradigm's limitations, on the other hand, appear to have gained importance recently. There is not enough space in the Netherlands to accommodate the low density. Almere's expansion will affect the natural landscape that surrounds the city. Separating work, life, and recreation increases this space use and puts a lot of pressure on the infrastructure. Most importantly, we witness a changing demographic that requires a different kind of housing. In the Netherlands of today, households are frequently smaller and do not require as much space as they did during the baby boom in the post-War Netherlands. This puts pressure on the Netherlands' current urban environment, which is dominated by the Row House Paradigm.

The methodology used in the thesis is mainly focused on research through design. This has mainly been expressed in the critical phase of *Analysis* and *Design Strategy*. The design process is a unorganised process and is therefore hard to explain, indicate and maintain to a certain methodology. However, Research through Design the a methodology that is capable of adapting very quickly. This is the reason why this methodology was mainly chosen in the analysis and design phase. This methodology also has downsides, which were expressed during the P2 presentation and the final phase of the design. The preliminary thesis plan describes as scientific relevance that this research appropriately identify, use, and evaluate the approach and methodology to demonstrate how suburban areas might be densified.
During the first stage of the research, the focus was on the national scale. Without realising it, this also evolved into the scope during the data collection. As a result, a significant amount of work had to be redone in the later stage of the research with more emphasis on Almere. It took a lot of time to do this. But it also provided a chance to ultimately evaluate the problem analysis and problem statement. This significantly enhanced and strengthened the research. Additionally, the majority of the literature discussed during the first phase of the research was not credible because it lacked scientific foundation. Often, literature was written by journalists or civil servants, which reduced the significance of the literature. Following the P2, more persuasive and academic literature in the field of urbanism was used to convey the story. Together with the previous remarks, this raised the research to a new level of scientific rigour, and it was satisfying to see the analysis come together.

As the Research Aim described, the thesis conducted research focused on the possibilities of densification and diversification on two levels. The most important scale was the city scale of Almere. Here, the results of the thesis formed the basis for a adaptive and alternative vision for Almere. This was put into practise in a neighbourhood that was crucial to the overall city strategy. After this is complete, the conclusion of the implementation chapter explained (yet to be written) how this neighbourhood can serve as a model for other neighbourhoods in Almere, which is crucial for the succes of the new city structure.
However, the implementation of the densification in an Almere post-war suburban neighbourhood that could be connected to any neighbourhood in the Netherlands formed the second level. In order to degenerate the results of this thesis in the implementation part, this neighbourhood was chosen. These decisions prevented generalisation of the findings.

During the start of the research, various etical considerations and dilemmas came to the surface. Is this the way we live today sustainable and futureproof? This consideration goes deeper into the meaning of the way we live. In the Netherlands, we are used to a standard of living which, as the research concluded, is connected to our wealth. This has of course a lot of upsides, but also downsides.

With all the problems and challenges facing this country today, are we still able to maintain our living standard where we are quite rpoud of in this country? This is quite an ethical consideration brought forward by this thesis. This thesis does not give the answer to this question. It does, however, answer a different question concerning ethical considerations. Does the paradigm of living in row houses need to change? This ethical consideration connects to the previous consideration. The paradigm of living in row houses in the outskirts of cities is well known in the Netherlands. But everything written down in the fprevious consideration has the ability to overrule this paradigm and make us think about the standards of living we set after the second world war. Connected to this, the ethical dilemme rises if densification is the correct tool to use, especially in the case of Almere? In the current age, densification is seen as the holy grail upon the tools to use in order to densify, and even renew or revitalise, a city. Is this even the correct tool to use and especially on the case of Almere? Does Almere need densification in order to revitalise itself?
The thesis concentrated on a different ethical issue. It was written from the top down perspective. Today's bottom-up strategy and participation process increase the chance of success. It can be said there is a regret of not suffiecient use the participation with and by residents and population. However, this can also be considered as important outcome of this thesis.

Figure 9.1: Almere-Poort (By author)

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Highrise construction in Almere-Poort (By author)

APPENDIX

1. Lifestyles numbers

	Total Households	Adventure Seekers	Pleasure Seekers	Harmony Seekers	Connection Seekers	Rest Seekers	Insight Seekers	Style Seekers
Nederland	8009966	11.2	18.1	12.0	12.5	17.2	13.3	15.7
Muziekwijk Noord	4709	10.3	15.9	14.5	11.7	17.6	12.8	17.2
Filmwijk	4497	11.3	19.7	15.0	11.4	13.2	11.5	18.0
Stedenwijk	4205	7.4	22.3	20.5	12.5	22.7	7.6	7.1
Tussen de Vaarten Zuid	3752	9.5	20.4	14.1	10.9	12.8	9.8	22.5
Literatuurwijk	3565	8.8	17.4	15.3	10.5	12.0	12.0	23.9
Kruidenwijk	3319	5.6	18.9	21.0	13.6	21.4	9.6	9.9
Waterwijk	3097	6.3	18.2	19.3	13.6	20.5	10.0	12.1
Homeruskwartier	2872	12.3	26.3	11.7	6.7	7.6	7.6	27.8
Noorderplassen	2815	9.2	15.5	9.4	5.9	5.4	10.6	44.2
Centrum Almere Stad	2744	22.2	22.9	7.8	7.7	20.0	11.1	8.4
Muziekwijk Zuid	2693	6.8	16.4	16.4	13.2	22.2	11.7	13.3
Stripheldenbuurt	2543	7.9	24.2	14.2	7.2	8.2	9.3	29.0
Bloemenbuurt	2274	9.4	20.4	13.6	12.7	21.3	9.3	13.3
Eilandenbuurt	2261	11.2	17.6	14.0	9.8	8.8	13.0	25.6
Europakwartier West	2249	24.3	28.6	7.6	4.1	9.3	9.2	16.9
Tussen de Vaarten Noord	2234	8.9	24.0	16.5	9.9	13.9	7.7	19.1
Parkwijk	2154	10.4	15.0	14.9	13.0	15.6	13.1	18.1
Danswijk	2128	8.5	23.0	19.7	10.8	13.4	8.7	15.8
Regenboogbuurt	2086	10.4	20.9	16.7	10.8	12.8	8.4	19.9
Oostvaardersbuurt	1989	6.0	22.8	19.5	8.8	10.1	9.6	23.2
Seizoenenbuurt	1928	9.4	20.5	17.0	10.9	13.1	9.5	19.6
Bouwmeesterbuurt	1849	5.3	17.8	22.4	14.8	21.0	8.9	9.7
De Wierden	1745	5.3	19.3	21.2	14.5	26.2	7.9	5.6
Faunabuurt	1654	7.3	21.3	14.3	11.4	13.9	10.9	20.9
Landgoederenbuurt	1626	10.5	17.8	15.7	11.0	15.9	11.3	17.9
Molenbuurt	1625	4.5	20.9	22.6	14.3	19.9	9.8	8.0
Verzetswijk	1376	9.8	15.8	15.3	13.2	13.8	10.8	21.1
Indischebuurt	1357	13.4	41.7	12.6	6.7	9.9	4.4	11.2
De Werven	1345	7.7	23.7	17.8	10.5	24.5	8.2	7.6

Centrum Almere Buiten	1344	3.3	30.9	13.8	7.9	26.0	13.5	4.8
Columbuskwartier	1295	13.7	29.0	11.7	5.9	5.6	6.6	27.6
De Marken	1294	6.7	16.4	17.2	16.2	18.7	10.8	14.0
Duin	1278	27.5	7.7	3.5	6.8	3.0	16.1	35.3
De Gouwen	1196	7.7	16.1	12.5	14.5	18.8	13.7	16.7
Staatsliedenwijk	1166	11.3	37.1	16.0	10.3	15.2	5.0	5.1
De Hoven	1134	6.9	22.8	17.0	13.9	20.5	9.6	9.3
Nobelhorst	1099	21.7	22.5	4.3	2.4	3.5	5.3	40.4
Centrum Almere Haven	1056	7.3	20.8	10.7	13.4	25.2	15.0	7.7
De Meenten	1034	10.8	17.5	16.2	13.5	18.0	11.6	12.3
De Grienden	985	5.2	13.4	19.2	15.1	22.1	11.7	13.3
Oosterwold	963	12.0	31.5	5.8	5.9	5.0	7.4	32.4
De Velden	590	8.1	5.8	2.2	4.7	5.6	20.2	53.4
Vogelhorst	586	6.7	3.8	1.4	3.9	3.1	13.8	67.4
Olympiakwartier West	420	28.6	7.9	11.0	0.2	4.3	3.3	44.8
Sieradenbuurt	386	8.3	11.4	6.7	9.3	8.0	14.8	41.5
De Laren	287	29.3	9.4	2.8	4.9	11.5	7.0	35.2
Overgooi	172	12.8	9.9	5.8	1.2	4.7	9.3	56.4
Buitenvaart	83	9.6	16.9	8.4	3.6	14.5	14.5	32.5
Randstad	62	3.2	0.0	93.5	0.0	0.0	0.0	3.2
De Steiger	37	0.0	56.8	2.7	5.4	2.7	0.0	32.4
Overig Almere Buiten	17	17.6	5.9	5.9	11.8	17.6	5.9	35.3
Overig Almere Hout	11	9.1	18.2	9.1	9.1	0.0	9.1	45.5
Poldervlak	10	0.0	0.0	20.0	0.0	10.0	10.0	60.0
De Vaart	7	28.6	28.6	0.0	0.0	0.0	28.6	14.3
Gooisekant	6	0.0	83.3	0.0	0.0	0.0	0.0	16.7
Markerkant	4	0.0	0.0	0.0	25.0	0.0	0.0	75.0

2. Calculations Economic Benefits

		Source
WOZ-waarde dwelling (€)	310.000	(Alle Cijfers, 2023
Price topping up (€/m²)	2000	(Bouwkostenadvies, 2022)
Price Expanding (€/m²)	2500	(Bouwkostenadvies, 2022)
Dwellings dimensions		
Floors (unit)	2	
Lenght (m)	9	
Width (m)	6	

Low density interventions

		Price (€)
Topping up (m²)	45	90000
Expanding (m²)	0	0
Number of dwellings	3	930000
Total costs		1020000
Total surface area (m²)		324
(€/m²)		3148,148

	Surface area (m²)	Prize
Dwelling 1	81	255000
Dwelling 2	54	170000
Dwelling 3		0
Dwelling 4		0
Dwelling 5		0

Moderate density interventions

		Price (€)
Topping up (m²)	162	324000
Expanding (m²)	162	405000
Number of dwellings	3	930000
Total costs		1659000
Total surface area (m²)		
(€/m²)		

	Surface area (m²)	Prize	Extra
Dwelling 1	108	310.000	42000
Dwelling 2	108	285.000	
Dwelling 3		0	
Dwelling 4		0	
Dwelling 5		0	

High density interventions

		Price (€)
Topping up (m²)	270	540000
Expanding (m²)	198	495000
Number of dwellings	3	930000
Total costs		1965000
Total surface area (m²)		708
(€/m²)		2775,424

	Surface area (m²)	Prize
Dwelling 1	138	383.008
Dwelling 2	78	216.483
Dwelling 3	90	249.788
Dwelling 4	54	149.873
Dwelling 5	108	299.746

3. Calculations Densification Muziekwijk-Noord

Current

Dwellings/households	632
Average HH size	2,4
Population	1517

Densification tools

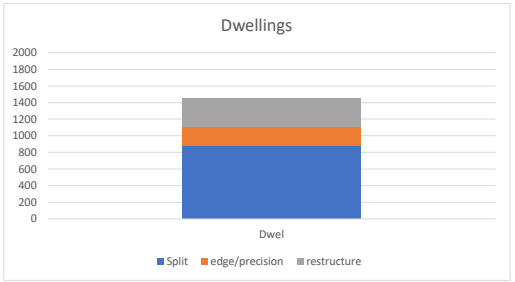
Density	1		1,5		2		3	
block type	3	4	3	4	3	4	3	4
Dwellings	3	4	5	6	6	8	8	9
Residents	7	10	9	14	16	22	21	23
Total m2	324	432	324	432	648	864	828	900
Average m2/p	45	45	36	31	41	39	39	39

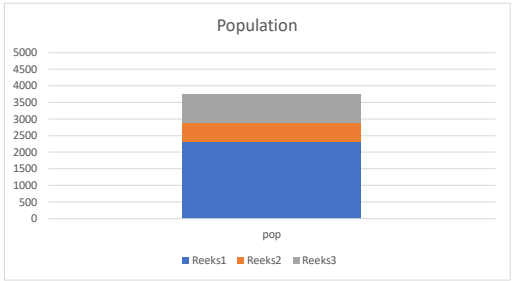
Split/Expand/Top up	
Edge/Precision intervention	
Restructure	

	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Block 7	Block 8	Block 9	Block 10	Block 11	Block 12	Block 13	Block 14	Block 15	Block 16	Block 17	Block 18	Block 19	**Block A**	**Block B**	**Block C**	**Block D**	**Block E**	**Total**
Households/Dwellings	20	24	22	22	26	13	45	31	28	13	34	31	54	52	64	37	26	18	6	0	0	0	0	0	**566**
Current population	48	58	53	53	62	31	108	74	67	31	82	74	130	125	154	89	62	43	14	0	0	0	0	0	**1358**

Design																									m2	Density
Total Dwellings (3)	4	0	2	2	2	0	3	6	4	0	2	2	12	0	8	2		6	2	2	2	4	4	3		
density x1			2	2	2				2				2			2									12	
density x1,5																									0	
density x2							1	6	2		1	1								2	2	2	2		19	6156
density x3	4						2				1	1	10		8			6	2			2	2	3	41	11808
Total Dwellings (4)	2	6	4	4	5	4	9	3	4	4	7	6	4	15	10			0	0	2	4	3	3	2		
density x1			4	4	5			3	2					2	5										25	
density x1,5																									0	
density x2							4		2		3	3		11	1					1	1				26	11232
density x3	2	6				4	5			4	4	3	4	2	4	13	18			1	3	3	3	2	81	25272
Extra																										
Dwellings total	50	54	22	22	26	36	99	48	42	36	74	65	122	114	128	123	162	48	16	29	47	55	55	42	1585	2,8
Population	130	138	52,8	52,8	62,4	92	261	124,8	110	92	195	172	316,4	307,2	330	313,4	414	126	42	77	123	143	143	109	4094	3,0

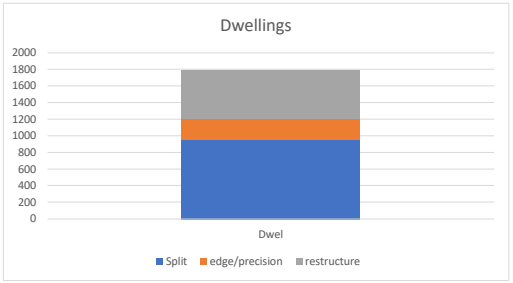
	Dwel	pop
Split	878	2298
edge/preci	228	595
restructure	339	865,4

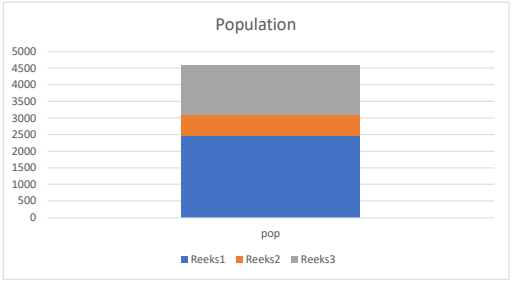




Max																											m2	Density
Total Dwellings (3)	4			2			3	6	4		2	2	12		8			6	2									
density x1																											0	
density x1,5																											0	
density x2																											0	0
density x3	4			2			3	6	4		2	2	12		8			6	2								51	14688
Total Dwellings (4)	2	6	4	4	5	4	9	0	4	4	7	6	4	15	5	22	22			2	4	7	7	5				
density x1																											0	
density x1,5																											0	
density x2																											0	0
density x3	4	6	4	4	5	4	9		4	4	7	6	4	15	5	22	22			5	4	7	7	5			153	47736
Dwellings total	68	54	36	52	45	36	105	48	68	36	79	70	132	135	109	198	198	48	16	45	36	63	63	45	1785			3,2
Population	176	138	92	134	115	92	270	126	176	92	203	180	344	345	283	506	506	126	42	115	92	161	161	115	4590			3,4

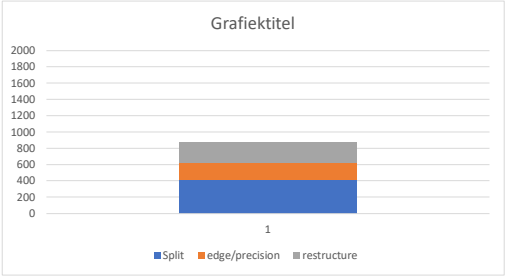
	Dwel	pop
Split	950	2455
edge/preci	252	644
restructure	583	1491

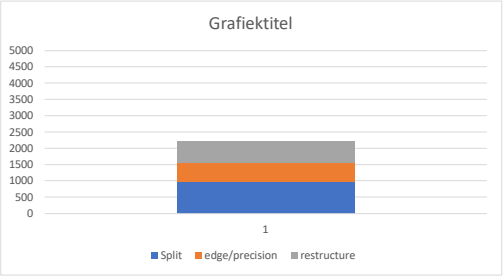




Min																											m2	Density
Total Dwellings (3)	4		2	2	2	3	3	6	4	3	2	2	14	12	0	1	2	6	2	2	2	4	4	3				
density x1	4		2	2	2	3	3	6	4	3	2	2	14	12	0	1	2	6	2								70	
density x1,5																											0	
density x2																				2	2	2	2				8	2592
density x3																						2	2	3			7	2016
Total Dwellings (4)	2	6	4	4	5	1	9	3	4	1	7	6	3	4	16	10	5			2	4	3	3	2				
density x1	2	6	4	4	5	1	9	3	4	1	7	6	3	4	16												75	
density x1,5																											0	
density x2																5	3			1	1						2	864
density x3																5	5			1	2	3	3	2			11	3432
Dwellings total	20	24	22	22	26	13	45	30	28	13	34	30	54	52	64	88	75	18	6	29	38	55	55	42	883			1,6
Population	48	58	53	53	62	31	108	72	67	31	82	72	130	125	154	232	195	43	14	77	100	143	143	109	2202			1,6

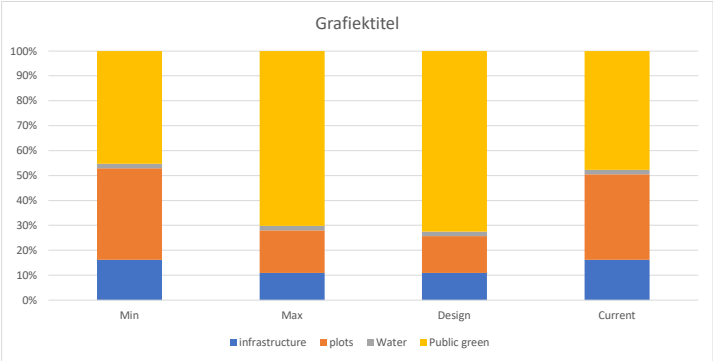
	Dwel	pop	
Split	407	976,8	1225
edge/preci	219	572	476
restructure	257	653	





Ratios				Min		Max		Design		Current	
infrastructı	59779 m2	16,24%		59779	16,24%	40051,93	10,88%	40051,93	10,88%	59779	16,24%
plots	126100 m2	34,26%		135004	36,68%	63050	17,13%	54468	14,80%	126100	34,26%
Water	6703 m2	1,82%		6703	1,82%	6703	1,82%	6703	1,82%	6703	1,82%
Public gree	175440 m2	47,67%		166536	45,25%	258217,1	70,16%	266799,1	72,50%	175440	47,67%
Surface are	368022 m2	100,00%		368022	100%	368022	100%	368022	100%	368022	100%
			Check	0		0		0		0	
			green per capita	76	m2	56	m2	65	m2	116	m2
			open per capita	106	m2	66	m2	77	m2	159	m2
			Living per capita	61	m2	14	m2	13	m2	83	m2

0



Highrise in the center of Almere-Stad (By author)